

Reinventing the Mutual Fund

An Essential Piece of Financial Engineering

February 25, 2005

**Q Group Spring Seminar
Key Largo, Florida
April 3 – 6, 2005**

**Gary L. Gastineau
Managing Director
ETF Consultants LLC
382 Springfield Avenue
Suite 206
Summit, New Jersey 07901**

**Tel: 908-598-0440
Fax: 908-598-0467
Email: gary@etfconsultants.com
Web: <http://www.yahoo.com>**

Reinventing the Mutual Fund

Introduction

If the mutual fund had not been invented in the 1920s, financial markets would be very different today. However, if the development and growth of mutual funds had not attracted about \$8,000,000,000,000 (\$8 *trillion*) to today's "legacy" funds, no investor, no investment manager and *certainly* no conscientious regulator would suggest that the primary repository of U.S. investors' financial assets in the 21st Century should have the characteristics of today's mutual funds. Starting with the position that a few features of today's mutual funds might be taken as examples of what *not* to do and taking advantage of available technology, I will sketch the outline of a new or "reinvented" fund structure and new investment processes.

My framework for new funds is very similar in some basic respects to the structure of today's exchange-traded funds. The idea that the ETF has some advantages over the conventional mutual fund is supported by the fact that it took U.S. ETFs less than 12 years to attract over \$226 billion in assets. Conventional mutual funds needed more than 66 years to accumulate as much.¹ Certain features of the existing index ETFs need to be modified or, more accurately, generalized to accommodate a wider variety of funds and to overcome some of the weaknesses that are apparent in the existing index ETFs. Some of the features I propose for the new fund structure are closely linked. They clearly work best if adopted as a package. Other features might be as readily implemented separately or as part of a different set of fund procedures.

I begin by describing what I believe are the three most important problems with mutual funds. The features of the new funds that I will emphasize address these problems. While my description of solutions outlines most of the major structural features of the

¹ Investment Company Institute 2004 Fact Book http://www.ici.org/stats/mf/2004_factbook.pdf The assets reported by the funds typically understate investor holdings by at least 20%. Investor holdings equal fund shares issued plus short interest.

new funds, a number of features will be barely touched upon or omitted to keep the topic manageable. Whatever the final shape of the funds that emerge from a series of changes likely to happen over the next 5 – 10 years, the result will be a more flexible investment management structure that meets the needs of a wider range of individual and institutional investors better than any fund structure currently available.²

Investors, skilled portfolio managers and analysts should look forward to these changes with enthusiasm. Investors will enjoy better net returns because many of the expenses they pay (directly and indirectly) will be lower. Top investment managers will work in a more constructive environment and will have the opportunity to earn more than they earn today. Their investment decisions will be made and implemented in an atmosphere that better preserves the confidentiality of the information they develop. The value of their work will be clearer to their investors and to their peers than ever before.

The new funds will increase the transparency of marketing costs – something regulators claim to favor, but have not yet achieved in practice. In fairness, some of the improvements in marketing cost transparency under consideration at the SEC show promise. If marketing cost transparency can be achieved, it will accelerate some structural changes by eliminating objections to change. No current participant in the creation, marketing or operation of funds who adds value for investors need be systematically disadvantaged by the new structure. Clearly, however, fewer people will be needed in the investment management and fund distribution process. Many industry participants will have to reinvent their own roles and re-justify their claims to a share in the costs paid by investors.

Much of the history of innovation in financial markets is a history of cost reduction or delivery of a better product or service at the same cost. In this context, Exhibit 1 is a

² The need for and value of several of the elements of this reinvented fund proposal was suggested in Gastineau and Lazzara (2004).

preliminary attempt to estimate how the new fund structure might improve the return a typical investor can expect from cost reductions on an improved actively-managed fund. There may be a touch of optimism reflected in the reduced costs and improved returns suggested in the table, but under any reasonable assumptions, the new structure offers a marked improvement in expected performance over the funds investors own today. The nature and source of most of these expected savings and performance improvements will be clarified in this paper.

Exhibit 1

Total Annual Shareholder Cost Comparison for Actively-Managed Funds

	Equity Mutual Fund	New Equity Fund
Basic Expense Ratio (ex 12b-1 or service fees)	1.0%	1.0%
Portfolio Composition Trading Cost Inside the Fund	1.5%	1.5%
Fund Share Trading Liquidity Costs	1.4%	*
Leakage of Investment Info/ Index** Publication	0.35%	
Fund Supermarket vs. Multi-Share Class ETF	0.35%	***
Performance Penalty from Oversized Funds, Net of New Funds' Higher Performance-Based Fee****	Up to 2.00%	
Total Annual Costs	Up to 6.60%	2.50%

Potential Shareholder Cost/Performance Difference: Up to 4.10% per year

* Costs to enter and leave the ETF Share Class are paid by the trading shareholder only when entering or leaving.

** Preliminary estimate based on an estimate of half the typical annual publication effect of S&P 500 composition changes. The value of stopping leakage of trading plans for active portfolios may be greater.

*** Costs in affected share classes equal to minimum annual supermarket preference fee charged by major brokers. Some supermarket fees are higher. There would be no ongoing annual sales or marketing fee in the new structure without specific agreement by the investor to pay it.

**** A rough average derived from conversations with active fund managers and trading cost analysts. The estimate allows for some of the performance penalty reduction being absorbed by a higher management fee as compensation for that performance.

The failure of regulators to require and the fund industry to accept useful reform in the wake of the mutual fund scandals of 2003 – 2004 suggests that necessary shareholder protection in conventional mutual funds is not possible within the current fund product structure and regulatory framework. My object in this paper is to demonstrate the compelling superiority of a new fund structure – superiority in investor protection and superiority in expected portfolio performance.

Problems With Mutual Funds

Mutual funds and their investment process are **not generally designed** to:

- (i) offer investors clear and inherent protection from most of the abuses uncovered in the recent mutual fund trading scandals;
- (ii) minimize investor costs from fund share and portfolio turnover;
- (iii) provide an appropriate allocation of transaction costs between entering and leaving shareholders on the one hand and ongoing shareholders on the other hand;
- (iv) allocate marketing and service costs appropriately among various classes of fund shareholders;
- (v) protect the confidentiality of an investment manager's trading plans; or
- (vi) require an efficient investment management process at the management company responsible for the selection of investments for a fund.

New actively-managed and indexed funds based on the exchange-traded fund model **can be designed** to:

- (i) offer investors increased and nearly automatic protection from most of the abuses uncovered in the recent mutual fund share trading scandals;
- (ii) reduce investor costs from fund share and portfolio turnover;

- (iii) provide an appropriate allocation of transaction costs between entering and leaving fund shareholders on the one hand and ongoing shareholders on the other hand;
- (iv) allocate marketing, management and service costs appropriately among various classes of fund shareholders
- (v) protect the confidentiality of an investment manager's trading plans;
- (vi) increase the productivity of the investment management process;

The new fund structure meets these needs in ways that should appeal to many investors who are unsatisfied with existing funds. It can also offer ETF-style tax efficiency.

There is no regulatory time-bomb embedded in these proposals. In fact, this structure is as close to "self-regulating" or, better, "structure regulating" as any fund I can imagine will ever be. Of course, this new fund structure will not work for all types of portfolios and transitions to the new structure will not always be painless.³ Unless a large investment management firm creates a number of relatively independent satellite fund management organizations to develop families of these funds, no one entity should expect to achieve the kind of market share that the five or ten largest mutual fund management organizations have in the U.S. today. But there is no reason why a parent organization could not create such a decentralized satellite structure.

Problems With Existing Funds

This section describes the three greatest problems with existing mutual funds. The new fund structure and investment process attack these problems.

³ Liquidity and transparency in many underlying markets – especially fixed income markets – has improved greatly in recent years. The generalized ETF model will work in most U.S. markets today with a little more financial engineering in a few of those markets.

The Problem of Free Liquidity⁴

The transaction costs that most often and most significantly reduce a mutual fund's performance are costs associated with giving free liquidity to fund share traders. To understand these costs, we need to understand – in detail – how money moves in and out of mutual funds and how the mutual fund scandals of 2003 and 2004 have highlighted this major cost obstacle to good fund performance.

Mutual fund share buy orders frequently arrive in large size on days when the market is strong near the close. A trader cannot buy the stock positions held by a typical equity fund at 4:00 p.m. closing prices by entering stock buy orders at 3:59 p.m. because orders to be executed "on the close" must be entered earlier. The trader can, however, buy shares in most mutual funds at their 4:00 p.m. net asset value (NAV) by entering orders a few seconds before 4:00 p.m. Just as a trader cannot execute stock trades right before the NAV calculation, the fund cannot make an immediate trade for its portfolio to invest the new cash at closing stock prices. Whether they intend to get in and out quickly or to stay for years, many buyers of fund shares make last-minute purchases on days with a strong market at the close. If they capture market momentum (buy fund shares at a net asset value based partly on prices that were not updated by the closing rally) their trades are particularly costly to their fellow fund shareholders. The fund usually will have to buy stocks at even higher prices on the next trading day to invest the cash inflow. Correspondingly, if a shareholder redeeming fund shares with an order entered near 4:00 p.m. captures downward price momentum, the fund usually will have to sell portfolio securities the next trading day at lower prices to cover the redemption. The fund is thus providing free liquidity for entering and departing investors – and the fund's ongoing shareholders pay the cost of that liquidity.

⁴ The extensive literature on the cost to ongoing shareholders of providing free liquidity to entering and leaving shareholders includes Chalmers, Edelen and Kadlec (2001a and b), Edelen (1999), Gastineau (2004), Goetzmann, Ivkovic, and Rouwenhorst (2001), Greene and Hodges (2002) and Zitzewitz (2003).

If the portfolio manager knows that the fund share purchase is a temporary investment designed to capture market momentum, she may not equitize (invest) the cash. When the fund shares are redeemed the next day or within a few days, momentum will often have driven the fund share net asset value higher. The fund share price of the redemption will be higher than the share price at which the shares were purchased. The cash which entered the fund earned modest money market rates for fund shareholders and earned those rates only for a few days. The appreciation in the fund share price that the trader captured came from the increased value of the equity portfolio and it came at the expense of the ongoing shareholders of the fund. Because the fund had proportionally more cash and less stock as a result of the timing trade, the performance of the fund's long-term shareholders was diluted by the cash invested temporarily by the fund share trader. The value of some of the stock portfolio appreciation was transferred from the long-term shareholders to the "temporary" shareholders who traded the fund shares. Some of these effects can be mitigated if fund managers use late-day trades in futures or ETFs or other techniques to modify equity exposure, but the cost of late-day fund share trading will not be eliminated as long as orders can be entered until 4:00 p.m.

Market timing trades in some of the more abusive stories that came out in 2003 and 2004 accounted for flow trading of many times the number of some funds' average number of shares outstanding. If the appreciation taken from the fund was, say, 2% for the average market timer's trade, purchases and then sales by market timers equal in value to a fund's average assets would reduce the fund's performance for ongoing shareholders by about 4% per year. With allowance for a greater market impact effect when a trader is not paying the cost of the impact, this estimate is in line with Plexus Group trading cost estimates.⁵ Studies of the impact of fund share trading offer

⁵ See Schwartz and Francioni (2004). Other estimates (Karceski, Livingston and O'Neal (2003) Bessembinder (2003); Domowitz, Glen, and Madhavan (2001); Keim (2003) Keim and Madhavan (1997) and (1998) (a survey article) and Peterson and Sirri (2003)) often show lower trading costs. The data used in these other studies comes from the period

compelling evidence that the costs of this trading to ongoing (non-trading) shareholders are substantial.⁶

Providing free liquidity to entering and leaving shareholders is costly to ongoing shareholders even if the buyers and sellers of fund shares are not market timers. In a study to measure the cost to ongoing shareholders of providing liquidity to entering and leaving shareholders, Roger M. Edelen (1999), then a Wharton School (University of Pennsylvania) professor, quantified the adverse effect of shareholder entry and exit costs on fund performance. Using a sample of 166 conventional equity and hybrid funds ranging in type from “small cap” to “income,” Edelen investigated the cost to the fund of providing liquidity to investors who enter and leave the fund. His study examined all purchases and sales of securities by the funds over a series of six-month periods. The six-month interval was determined by the standard portfolio reporting interval for mutual funds at the time of the study.⁷ Edelen was able to break down each fund’s trading into flow (fund share trading) and non-flow (portfolio composition changes) components. He measured how much of the flow-related portfolio trading was incremental trading from having to purchase and sell portfolio securities in response to the entry and exit of shareholders. His methodology revealed the cost of the fund share trading, not the motives of buying and selling fund shareholders. To phrase that point in a different way, his analysis did not reveal whether a fund share buyer or seller was an ordinary investor or a market timer. Some reports have suggested that market timers are unique in costing fund shareholders lost performance, but it is not clear that market timing trades are materially worse than other kinds of fund share trades that

before price quotes were in pennies and do not adequately reflect the increased cost of institutional trading in more recent years.

⁶ Hulbert (2003) and Keim (2003) discuss the challenge of earning a profit as a momentum trader. Under most circumstances, the momentum trader must buy into a rising market and sell into a declining market, accepting the prices he finds. If the momentum occurs near a market close, as it often does, mutual funds offer free liquidity to traders at the expense of their ongoing shareholders and the momentum trader gets the benefit of any “stale” prices.

⁷ The Securities and Exchange Commission implemented requirements for quarterly portfolio reporting in 2004.

rely on the free liquidity offered by most conventional mutual funds. The trading costs Edelen attributed to the liquidity offered to entering and exiting shareholders accounted for an average *net* reduction in *annual investor return* of about 1.43% in the funds he studied. That is the basis of the 1.4% cost estimate in Exhibit 1.

Exhibit 2 Fund Share Flow and Portfolio Turnover for Selected Funds During Selected Periods

(Shares in Thousands, All Percentages Annualized)

Fund (year ending)	Shares Outstanding	Shares Issued ³	Shares Redeemed	Fund Share Flow ⁴	Portfolio Turnover
Vanguard 500 (12/31/03) ¹	733,805	146,182	115,745	37%	2%
Vanguard Total Market (12/31/03) ¹	925,632	324,147	120,340	54%	2%
Fidelity Mid-Cap Stock (4/30/04)	389,735	122,333	61,953	51%	137%
Fidelity Technology (2/29/04)	41,960	14,603	11,248	64%	127%
PBHG Growth Fund (3/31/02) ²	101,665	760,668	791,641	1325%	171%
PBHG Growth Fund (3/31/03) ²	80,513	10,894	32,046	47%	168%
PBHG Growth Fund (3/31/04) ²	53,810	8,149	37,279	68%	164%
Invesco Technology 2003 (3/31/03) ¹	63,039	224,764	235,590	673%	107%
Invesco Technology 2004 (3/31/04) ¹	55,023	38,943	46,959	146%	141%

¹Investor Class Shares Only

² PBHG Class Shares Only

³ Excludes shares issued in dividend reinvestment when that number is available

⁴ (Shares Issued + Shares Redeemed)/(Average Shares Outstanding during the Year)

Source: Fund reports and SEC filings

As a practical matter, an individual investor will find it difficult to determine how much portfolio turnover in a large number of funds might be due to intended portfolio composition changes and how much comes from providing liquidity to entering and leaving shareholders. Exhibit 2 compiles and compares data on (portfolio) turnover and flow from fund shares issued and redeemed for a few funds. Of the two types of trading, fund share flow is not only more costly than turnover from intentional portfolio

composition changes; it also requires a little more effort for an investor to determine how much flow a fund has experienced.

Exhibit 2 deserves careful attention because it reveals some of the differences in trading activity (1) measured by fund share flow from entering and leaving shareholders and (2) measured by portfolio composition turnover that is in the hands of the fund's portfolio manager. The number that I call fund share flow and which appears in the column with that label in Exhibit 2 is not a standard or reported number, but I define it as Edelen (1999) defined flow. Flow for a year is equal to fund shares issued plus fund shares redeemed, divided by average fund shares outstanding. (The flow calculation counts the purchase and sale separately because they occur at different times and each has a clearly separate market impact cost.) The calculation of flow is not required by the SEC and, to the best of my knowledge, it is not calculated or published by any fund service whose data is readily available to the investing public. As logical as its significance appears to be, aside from Edelen's work, I have not seen the calculation made, described or defined elsewhere. The closest published equivalent is Lipper's "**churn**" measurement (described below.) You can calculate aggregate flow for the fund industry and for various fund types from data published by the Investment Company Institute (2004).

When I began the analysis which led to the calculations in Exhibit 2, I expected that there would be a high correlation between (unreported) flow and (reported) turnover. I expected that funds where market timers and other traders had engaged in active fund share trading – as illustrated in three or four digit percentages for flow in the next-to-last column of Exhibit 2 – would also show extraordinarily high turnover for the same period(s). My expectation that turnover would be highly correlated with flow proved incorrect. Apparently, some combination of knowledge by the fund manager that certain fund share purchases were temporary and the common practice of equitizing fund share purchases with futures contracts or other short-term instruments eliminated

the link I had expected to find between turnover and flow.⁸ If the portfolio manager had believed that the fund share purchases that were part of this extremely high flow were being made by ordinary investors, I would have expected her to buy and sell stocks. If she had equitized and de-equitized all the cash changes with stocks, the reported turnover would have increased to more than one-half of the flow number. Chalmers, Edelen and Kadlec (2001b), using a much larger sample, found no correlation between performance and turnover but a strong negative relationship between fund returns and measured trading expenses. Similarly, Don Cassidy of Lipper finds only a weak relationship between his measure, "churn," and turnover. (Churn is captured in a combination of two ratios. It is measured as high redemptions as a percentage of average net assets – at least 200% – accompanied by a ratio of redemptions-to-sales that is close to 100%. Churn would be approximately one-half the value of flow for the funds with flow over 400% during the same period.)⁹

The PBHG Growth Fund and the Invesco Technology Fund featured in Exhibit 2 are two of the funds often cited as having been used by market timers during part of the period for which data is displayed. The reason for the association of these funds with market timing trades is apparent in the fund share flow calculations which show extremely high fund share trading volume.

As noted, flow is simply the sum of shares issued and shares redeemed divided by average shares outstanding, expressed as a percentage. This percentage should give a clear picture of the dilution experienced by a fund's ongoing shareholders when the fund is accommodating traders or growing or shrinking. During the period of highest flow, the turnover numbers for the PBHG Growth Fund and the Invesco Technology Fund were not materially different from the turnover in other periods or from the

⁸ A transaction in a futures contract with a remaining life of less than one year is excluded from the turnover calculation.

⁹ See Cassidy (2005). His paper illustrates the kind of fund analysis that is possible with a comprehensive and accurate database.

turnover in several Fidelity funds with similar investment objectives. In contrast to the PBHG and Invesco funds, the Fidelity funds saw only modest flow because they have some protective features in place to discourage their use by market timers.

Flow is easy to calculate, but the data for the calculation may be hard to find if you do not have a copy of a fund's annual report. The effort to find it can be worthwhile because flow is the best measure of the largest cost element most fund investors "pay".

The Securities and Exchange Commission is in the process of addressing the adverse impact on long-term fund shareholders of providing free liquidity to fund share traders in two ways: first, the SEC contemplates a rather crude 4:00 p.m. cut-off for all purchase and sale orders. As described above, a trade arriving shortly before 4:00 p.m. can be very costly to the fund's ongoing shareholders regardless of how long the investor stays in the fund. By itself, the 4:00 p.m. cutoff is not especially helpful. The SEC has considered mandatory redemption fees for fund share purchases redeemed within a period as short as five days to discourage market timing trades. The current SEC plan is said to call for optional redemption fees.

While these rule changes should eliminate orders that arrive after 4:00 p.m. and redemption fees will discourage small investors from market timing transactions, large investors – who can hedge their risk of remaining in the fund until the redemption fee period passes – will not be discouraged by this combination. Furthermore, the provision of free liquidity to ordinary entering and leaving shareholders will continue without change. Long-term shareholders will continue to bear the cost of providing this liquidity.

Only an earlier cut-off – say, 2:30 p.m. for arrival of orders to purchase or redeem shares in a domestic equity fund – will permit the fund's portfolio to protect ongoing shareholders from the cost of fund share traders by investing cash or selling shares as

appropriate before the market closing prices are determined. With an earlier cutoff, redemption fees are largely irrelevant.

Protection of Information

Today, most sizeable investment-management organizations provide a wide variety of products to investors. These investment products are usually managed independently, in the sense that each portfolio is independent in composition relative to other portfolios. However, because funds and other products from the same advisor hold numerous securities in common and because the investment manager has a responsibility to the beneficial holders of each portfolio or “separately managed account” product to treat them fairly, management of the products is partly integrated. What “integration” means in practice is that when the firm embarks upon the purchase of a particular security or group of securities, the securities are often purchased for many or maybe even all of the manager’s accounts or funds at about the same time. To manage conflicts of interest, some investment management organizations have developed techniques to handle purchases and sales for different accounts in a sequence or rotation. The rotation is designed to assure that a particular account comes first on the list for some investment ideas, in the middle for others and, inevitably, at the bottom of the list for still others. The starting point for purchase of a new position or liquidation of an old position is selected at random or the starting point simply moves from the top to the bottom of the list, a step at a time, recycling back to the top until a position has been either taken or liquidated as necessary. Alternatively, a trading desk that handles trades for all of the manager’s accounts may calculate an average price and give each account the same average price with all accounts participating in trades over a longer period.

The problem with these procedures is that each type of account that might hold a specific position has characteristics that cause its trading practices to *reveal different*

amounts and kinds of information, almost at random, to other market participants while the trading moves through account categories or trades are allocated to all accounts over a period as long as a few weeks. The products with the greatest information leakage are separately managed accounts for individuals, but separately managed institutional accounts also dissipate the value of investment information pretty quickly.

Clearly, one of the weaknesses of the typical active manager's investment management process – in which different types of accounts are buying or selling the same security – is *information leakage that could be largely eliminated if all of the manager's clients met in a single portfolio or in a single type of product* with delayed publication of portfolio contents and changes. With funds for each investment objective, there are no conflicts associated with the order in which transactions are made, and there would be no leakage to outside organizations from trade confirmations sent to owners of separate accounts and individuals associated with institutional portfolios. Effective information management can be accomplished most efficiently and most confidentially with multiple-share-class funds subject to required portfolio disclosure only once a quarter with a 60-day publication lag.

Failure of Active Management

Rather than review the extensive literature on active manager performance in an attempt to develop a solution to the active manager selection process, I want to focus on one unusual academic paper that provides some powerful insights and, I believe, some guidance for any investor in search of a superior active manager. This is an award-winning paper by Berk and Green (2004)¹⁰ which ventures to explain a number of investment management phenomena that have puzzled observers for years. Berk

¹⁰ FAME Research Prize 2003, International Center for Financial Asset Management and Engineering, Geneva, Switzerland. The Berk and Green quotations in subsequent paragraphs are from an earlier version of this paper dated December 9, 2002. Both versions of the paper acknowledge financial support from the Q Group. The earlier version, which was published as a National Board of Economic Review working paper, is more reader-friendly than the final version, but there are no substantive differences.

and Green offer a model of investor and manager behavior consistent with the observations:

- (1) that there are superior managers;
- (2) that rational investors try to find those managers and give them money;
- (3) that the superior managers often deliver superior performance;
- (4) but only for a limited time.

One key insight of the Berk and Green analysis is that, as the superior manager becomes more and more successful and attracts more and more money, it becomes increasingly difficult for her to deliver superior performance. Hence, they affirm the importance of engaging a manager early in her career before she is swamped with so much money that she can no longer deliver superior performance.

The Berk and Green manager performance model is worth a closer look because it suggests a possible solution to the active management performance problem. Berk and Green cite a number of earlier studies that found evidence of performance persistence in mutual funds: Gruber (1996), Carhart (1997), Zheng (1999) and Bollen and Busse (2005). They note that other researchers have found that flows into and out of mutual funds respond to excess returns (with a lag), citing Chevalier and Ellison (1997) and Sirri and Tufano (1998). They also note that there is no solid evidence of long-term persistence of superior performance and they confirm the widely-held belief that money flows into funds that have performed well recently. The oft-cited tendency of most (or all) net new mutual fund money to go into funds that have Morningstar four-star and five-star ratings is simply the most widely discussed evidence that investors throw money at last year's hot managers.¹¹

¹¹ Not all of the citations attribute this cash flow to the star ratings. Many see the stars as no more than a label that relieves some investors from the need to inquire deeply into recent relative performance.

Berk and Green cite Bollen and Busse (2004) in connection with fund selection, "The existence of the mutual fund selection industry is predicated on the assumption that some mutual fund managers possess significant ability and that this ability persists, allowing the astute investor to predict future performance based on past results." Berk and Green also cite Gruber (1996) and Sirri and Tufano (1998) on the issues of performance predictability and the forces that drive fund flows into mutual funds based on recent past performance. Taking a behaviorist's perspective, Berk and Green do not describe this investor behavior as irrational. Instead, they develop a model that accepts the behavior of all the parties involved – mutual fund managers, investors and even providers of fund advisory services – as rational. Their model explains the strengths and weaknesses of actively-managed mutual funds. It explains the presence and persistence of high management fees; it explains the search for performance; and it explains why talented investment managers select an occupation – and the open-end mutual fund product structure – where few earn life-long laurels but many earn a lot of income. The Berk and Green solution is a market solution that is, perhaps ironically, consistent with *both* a generally efficient market *and* differential abilities among managers.

Berk and Green posit that, "Skilled investment managers exist who can generate positive risk-adjusted excess returns. Managers and investors alike know who these managers are." Yet, in a market at equilibrium, "investors who choose to invest with active managers cannot expect to achieve positive excess return on a risk-adjusted basis." Attempts by investors to invest with superior managers provide these managers with an excess supply of capital. Every investor would rationally want to abandon below-average managers or indexing and invest with the superior active manager instead. However, market equilibrium depends upon the expected return to investors in all funds being equal. Otherwise, "one manager would end up managing all the available investment capital leaving the manager with no investors to trade with, which contradicts the assumption that the manager can earn excess returns."

The point of all this is that, as most active managers have believed since the beginning of investment history, an active manager's ability to add value in terms of excess return tends to decline as her assets under management increase. Successful managers charge high total fees even though their expenses (per dollar of assets managed) decline as assets under management increase. One function of high fees is to obtain as much as possible of the excess return which the superior manager can obtain *for the manager*.¹² Total fees rise and assets under management at these fees rise until whatever ability the manager has is swamped by an inflow of assets and an increase in costs – largely transaction costs – that cancel out the manager's ability to provide above average performance. The behavior of the investors is rational, the behavior of the manager is rational, the market works – but the investor's search for a superior return has been frustrated by the manager's success in attracting assets.¹³

With Berk and Green's model, chasing a superior active manager's performance can lead to poor results for investors even if they are willing and able to shift from one manager to another as growing assets overwhelm the first manager's ability to extract a superior return. If Berk and Green's model describes reality – and I believe it comes pretty close – trying to get on a skilled manager's performance bandwagon early and being willing to switch bandwagons when the manager's assets under management exceed her competence, *is the only way most investors have a shot at superior performance from an active manager in today's fund marketplace*. Frequent switching from one bandwagon to another is not an attractive strategy. The Berk and Green model suggests to me that a different fund and compensation structure can serve both investors and active fund managers better than the current structure that Berk and Green have analyzed so well.

¹² Thus, the Berk and Green model provides an explanation of the very slow decline in fees per dollar managed as a fund's assets under management increase.

¹³ Two other papers that suggest to me that this capping approach might lead to superior performance are Stein (2004) and Chen, Hong, Huang and Kubik (2004).

Improving the Fund Product – Some Simple Examples

Although most of the new fund features have far wider applicability, my emphasis will be on actively-managed domestic equity funds for simplicity and clarity. Some of the key features are:

Early cut-off times for orders to purchase and redeem fund shares

While the established ETF in-kind creation and redemption structure provides protection from the grosser forms of mispricing and shareholder abuse uncovered in the mutual fund trading scandals, active fund managers and astute index fund managers need greater flexibility in managing the portfolio than is inherent in the exchange-traded index fund creation and redemption process as it is used today. Specifically, the necessary and appropriate publication of fully transparent creation and redemption baskets discourages and increases the cost of effective implementation of portfolio composition changes. The notice of intent to create or redeem fund shares must come early enough to permit the portfolio manager to adjust the portfolio for the creation and redemption trades. In particular, the creation and redemption baskets for active ETFs will not reflect the manager's target fund portfolio as accurately as they typically reflect the composition of a benchmark index ETF. I would go further. The manager of any fund needs the ability to trade between the time the fund receives notice of fund share purchase or sale and the time the net asset value is next calculated to protect ongoing shareholders from the cost of providing free liquidity to fund share traders.

Early notice permits the portfolio manager to adjust the portfolio composition and incorporate the market impact of the entry or exit of shareholders on the prices used to calculate the fund's net asset value (NAV). The entering or leaving shareholders are demanding liquidity and – with early notice to permit portfolio composition changes – they will be paying for it indirectly. The portfolio manager's ability to adjust the composition of the fund portfolio after receiving notice of creation or redemption of shares using previously posted creation and redemption baskets is essential to

transferring the costs of entering and leaving the portfolio to the entering and leaving shareholders and relieving the ongoing shareholders of this burden.

I have suggested a time of 2:30 p.m. as the cutoff for purchase or redemption of baskets on days when the market closing is 4:00 p.m. This time should be considered an example of what might be an appropriate cutoff time for domestic equity portfolios. This time is selected to be an early enough cut-off notice to permit the portfolio manager to adjust the portfolio to an appropriate portfolio composition by the time the market closes. In specific cases, as governed by the prospectus or subject to approval by the fund's board, the fund might set an earlier or a later cut-off to provide the best possible service to entering and leaving shareholders without compromising the protection of ongoing shareholders. For funds other than domestic equity funds, different cut-off times will be required. In the case of international equity funds, for example, the appropriate early cut-off time for funds holding more than 3% of their assets in stocks traded on one or more primary markets outside the United States, could be 4:00 p.m. on any U.S. business day for pricing at the net asset value next determined for the fund after a full trading day in the primary markets for stocks accounting for 97% of the fund's equity portfolio. The 2:30 p.m. creation/redemption cut-off for domestic equity funds and comparable rules for other types of portfolios, combined with all entry and exit through the ETF creation and redemption process, solves the fund industry's greatest investor protection problem.

Entry and exit of investors through an ETF share class or an equivalent process to protect ongoing shareholders from the cost of providing liquidity to fund share traders

Fully effective implementation of the improved fund requires that all entry of assets to and removal of assets from the fund will be made through the generalized exchange-

traded fund share creation and redemption process described above or a procedure providing equivalent protection for ongoing shareholders. This process protects ongoing fund shareholders from the costs of providing liquidity to entering and leaving shareholders. The late trading and market timing abuses uncovered at many mutual funds since September 2003 would not have been possible if the in-kind creation and redemption process, standard in exchange-traded funds, had been in effect for conventional mutual funds. The general requirement for in-kind creation and redemption combined with early cutoffs protects fund shareholders from the cost of providing liquidity to traders by creating a clear audit trail for the order entry process. Redemption largely in-kind offers substantial advantages for taxable shareholders through deferral of capital gains realizations until a shareholder decides to sell his fund shares.

Conversion of the exchange-traded share class, upon shareholder demand, to Specialized Share Classes

A variety of Specialized Share Classes will be available for conversion from and back to the ETF Share Class used for fund shareholder entry and exit. These Specialized Share Classes provide custom management fee and marketing fee arrangements to accommodate different types of shareholders with investment objectives that coincide with the objective pursued by the fund. Among other features, these Specialized Share Classes are structured so that investors pay marketing and management fees in a tax-efficient manner and receive appropriate management fee discounts if they are large investors.

Under the U.S. tax code, separately billed fees paid by individuals for investment management services and various other services provided by financial intermediaries are not fully deductible against ordinary income taxes. For individuals subject to the Alternative Minimum Tax, separately billed fees may not be deductible at all. To

preserve as much deductibility as possible, the most tax-efficient way for individuals to pay marketing and management fees is to pay them as management or service fees deducted from the investment income produced by funds in which they own shares.

Large institutional investors have more negotiating power than individual investors and traditionally pay lower investment management fees. However, in order to manage portfolios effectively and economically, it is often best to bring all types of investments into a single pool rather than manage institutional portfolios separately from individual mutual fund portfolios. Such portfolio consolidation is another part of the purpose behind the use of different share classes.

Less frequent intra-day dissemination of a precise ETF portfolio valuation proxy

Another feature of the improved fund is an increase in the interval between computerized “precise” intra-day ETF proxy net asset value (NAV) calculations distributed through electronic quotation vendors during the trading day. The proxy value is based on the contemporaneous bids and offers for each security in the portfolio translated into a per-fund share value expressed as a bid and offer or as the midpoint between the bid and the offer. The interval need be no shorter than the 15-second interval standard for today’s index ETFs, and no longer than 60 minutes and may vary within that range at the discretion of the fund’s board of directors, subject to regulatory approval. If the Securities and Exchange Commission staff achieves its objective of making fund sales and marketing expenses completely transparent later this year, that transparency should remove most industry objections to transparency in the Specialized Share Classes of these new funds.

The reason for reducing the frequency of NAV proxy dissemination is that dissemination every 15 seconds provides a total of more than 1500 fund share values during the

standard trading day. Given that actively-managed funds usually have fewer positions than a broad market index exchange-traded fund, dissemination of precise share values every 15 seconds delivers a great deal of information and would permit an astute analyst to back calculate the composition of the portfolio and learn inappropriate details (from day to day) about the fund's ongoing trading activities. The appropriate interval for precise NAV proxy dissemination will vary for different funds depending in part upon the number and nature of the securities in the portfolio. However, the appropriate time interval for publication of precise indicative values does not bear a rigid relationship to the number of securities in the portfolio or any measure of portfolio turnover. Controlling the amount of information on the content of the portfolio provided to the marketplace will protect the fund shareholders from front-running of transactions the fund portfolio manager is making to modify the fund portfolio.

If an approximate or indicative value is required at 15-second intervals for the guidance of investors and market makers, a randomized process can meet this need while reducing the portfolio information content of calculations disseminated between, say, hourly precise share value calculations. Specifically, the values between periodic releases of precise values based on the actual portfolio could be based on the 15-second interval precise portfolio values incremented or decremented by a number drawn at random from a disclosed distribution. The random increments and decrements in these values will eliminate the opportunity to use frequent per-share valuations to determine portfolio composition, yet avoid an indicative price that is too far away from the actual portfolio value to be useful to market participants.

Use of a risk factor model profile of the unrevealed segment of the ETF portfolio in combination with a posted creation or redemption basket to facilitate hedging transactions

The new funds will use a risk factor model to analyze the net portfolio positions that are not included in a fund's daily creation and redemption baskets. Factor models or other techniques designed to permit market makers and other traders to manage the risks associated with undisclosed portfolios like the net portfolio positions that are not included in an ETF's daily creation and redemption baskets can be used in several ways. For a number of reasons related to the impact on fund performance, I prefer to use the creation or redemption basket as part of any hedging portfolio and use a factor model to create or describe a supplementary hedging basket that a trader or market maker could use in addition to the creation or redemption basket to hedge the risk of trading or making a market in the fund shares.

Output from this risk factor application will be posted daily for use by any investor, trader, market maker or market data provider that wanted to use it with the creation or redemption basket to hedge the risk characteristics of the fund shares. The factor model output could take one of two forms: (1) a factor format to be used by market participants to develop their own supplementary hedging portfolios or (2) a list of instruments to be used by market participants in combination with the creation or redemption basket. The first choice offers more information and implies tighter spreads. The second choice emphasizes greater protection of information.

In its model for trading actively-managed ETFs, the American Stock Exchange (AMEX) proposes to use a risk factor model to develop a comprehensive proxy portfolio that would closely track the behavior of the actual fund portfolio with a basket of tradable financial instruments for the purposes of providing a hedging basket and an intra-day share value proxy that would replace the 15-second actual portfolio proxy pricing that is standard for today's index ETFs. The AMEX proxy portfolio would not necessarily include any specific components of the fund portfolio.

The factor model application I contemplate departs significantly from the AMEX proposal. The combination of posted creation and redemption baskets and proxy values for the fund produced by the factor model application I propose will provide as much information on the actual portfolio as the portfolio manager feels she can appropriately release to the market – and no more. The package of information released will be reflected in the combination of (1) the frequency of publication of precise proxy values, (2) the parameters of the distribution from which increments and decrements for the precise proxy values are drawn, (3) the composition of the creation and redemption baskets, (4) how the factor model output is published, and (5) the absence of leakage through non-fund products. By managing these five elements, the portfolio manager controls the information revealed, protecting current shareholders while providing as much information as possible to minimize fund share trading spreads.

Although this process *may under some circumstances* reveal slightly more about portfolio composition, it is superior to the AMEX proposal in several respects. First, the information revealed is fully controlled by the portfolio manager. Second, instead of providing a value for share trading based on a proxy portfolio, the system will provide less frequent precise values based on the actual portfolio. If market participants desire share value estimates between the publication of, say, precise hourly values, the interim values can be based on either the randomized proxy publication process described above or proxy value calculations based on the combination of the creation basket and the complementary hedging portfolio. Either choice would be expected to produce values *at least* as precise and accurate as the all factor model pricing and hedging approach proposed by the AMEX without revealing inappropriate details on portfolio composition. Third, this process is also superior to the AMEX proposal in that creation and redemption baskets based in part on the actual portfolio will have the effect of reducing fund investor and market maker trading costs. Because some part of the redemption transaction will be in-kind, the use of redemption baskets containing

some portfolio securities will assure a higher degree of tax efficiency than would be possible if the creation and redemption baskets did not contain any positions held in the fund portfolio. The publication of precise hourly values also facilitates a new fund share and basket product trading process.

Organization of the investment manager to concentrate portfolio management efforts on the management of a single type of account to reduce leakage of investment information

With a unified portfolio management and trading operation and limitations on product offerings, shareholders will be well-protected from inappropriate dissemination of investment information. Specifically, the value of an investment idea can be preserved until the funds managed by the organization have time to buy or sell as much as they want of a particular security. If all of the manager's accounts are funds with the same requirement for portfolio disclosure, i.e., quarterly with a 60-day lag, information leakage should be as limited as any investment management operation can achieve. If the investment management organization wants to increase disclosure to improve the trading characteristics of the ETF share class, that is also possible. With the concurrence of a fund's directors, the investment manager may disclose a recent fund portfolio to the public at appropriate intervals by any means the appropriate regulatory authorities approve. These means may include posting on a website or other electronic dissemination. The disclosure process will permit free and equal access to the information by any investor with Internet access. When implied portfolio disclosure is made through changes in creation and redemption basket composition, these changes must be appropriately disseminated through public postings. Formal portfolio disclosure can be no less frequent than the quarterly disclosure with a 60-day lag now required of all 40 Act funds; but, in many cases, fund managers will be encouraged by market forces to make more frequent portfolio disclosures to increase the efficiency of

secondary market trading in the fund shares without harm to ongoing fund shareholders from such disclosures.

Improving investor returns by concentrating portfolio manager effort on controlled-size funds; capping the assets the manager will accept for specific fund strategies and providing for a higher fee on capped funds that perform well

The purpose of capping some funds is to create an environment which eliminates the traditional conflict between the interest of investors in performance and the interest of investment managers in accumulating large pools of assets that generate large total fees but make superior investment performance difficult or impossible, as suggested by Berk and Green (2004).

Capping should permit portfolio managers to post better performance records and, subject to the operation of a process to increase the management fee as a reward for good performance, even earn more income. With fund management fee increases linked to multi-year performance and capped fund shares trading at a premium to net asset value (NAV), both investors and managers can earn more than they might earn from larger portfolios using traditional fund fee structures. The new fee structure will provide an incentive for performance more in line with the fund shareholders' interests than current fee structures.

After a fund reaches its cap in terms of the number of ETF share equivalents to be issued, the fund might see few redemptions unless the creation and redemption rules are designed to encourage occasional redemptions. The existence of a cap without modest variability in the number of shares outstanding would foreclose redemptions and lead to much greater share price volatility in the secondary market trading of the capped funds' shares than is necessary or desirable. The absence of redemptions could

also reduce the tax efficiency of the fund. To permit the fund share market price to more closely reflect changes in the fund's net asset value and to avoid significant fluctuations in any premium which the market price of the shares may carry over the fund's net asset value, it is appropriate that a market maker with a temporary excess inventory of shares in a fund should be able to redeem fund shares from time to time, bringing the size of the fund below the stated ceiling on the number of shares the fund would issue. For a limited period subsequent to such a redemption, the redeeming authorized participant would have the exclusive right to re-create the shares it had redeemed. If the redeemer does not re-create within the designated period, the fund has the option of either shrinking the cap on the number of shares it would issue (to shrink the fund because management has determined that the capped size was too large) or permitting any Authorized Participant to create shares up to the posted share ceiling under standard (NAV) terms for fund share creations.

This redemption and re-creation provision helps market makers with fund share inventory management. It moderates fluctuations in any premium on the fund shares' price in the secondary market once the ceiling on share issuance is reached. It also provides a mechanism whereby an occasional in-kind redemption can enhance the fund's tax efficiency. The expiration of the right to re-create also permits the fund to shrink its maximum capitalization if the fund's market space becomes less liquid or if the original ceiling on share issuance was not set low enough to protect the fund from being overwhelmed with assets.

Conclusion

The proposals in this paper do not begin to exhaust the possibilities for improvement in funds. As the discussion of problems with existing fund products and the opportunities for performance improvement outlined in Exhibit 1 suggest, the focus has been on producing a better product for investors. As the discussion of opportunities for higher investment management fees in response to superior performance on a smaller pool of

assets also suggests, there is no reason why a structure that better utilizes the talents of skilled active managers cannot compensate these managers more generously at the same time that it provides better results for investors.

BIBLIOGRAPHY:

1. Berk, Jonathan B. and Richard C. Green, "Mutual Fund Flows and Performance in Rational Markets," *Journal of Political Economy*, Volume 112, Number 6, December 2004, pp. 1269 – 1295,
<http://www.journals.uchicago.edu/JPE/journal/contents/v112n6.html> An earlier version (December 2002) was published as an NBER working paper
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=338881
2. Bessembinder, Hendrik, "Issues in Assessing Trade Execution Costs," *Journal of Financial Markets*, 2003, vol. 6, pp. 233 – 257.
3. Bollen, N.P.B. and J.A. Busse, "Short-Term Persistence in Mutual Fund Performance," *Review of Financial Studies*, August 2004.
4. Carhart Mark M., "On Persistence in Mutual Fund Performance," *The Journal of Finance*, March 1997, pp.57 – 82.
5. Cassidy, Donald, "Observations on Frequent Trading at Mutual Funds," *Lipper Fund Industry Insight Report*, January 3, 2005
<http://www.research.lipper.wallst.com/fundIndustryOverview.asp>
6. Chalmers, John M.R., Roger M. Edelen and Gregory B. Kadlec, "On the Perils of Financial Intermediaries Setting Security Prices: The Mutual Fund Wild Card Option," *The Journal of Finance*, Volume LVI, No. 6, December 2001a, pp. 2209 – 2236.
7. Chalmers, John M.R., Roger M. Edelen and Gregory B. Kadlec, "Fund Returns and Trading Expenses: Evidence on the Value of Active Fund Management," Working Paper October 15, 2001b.
8. Chen, Joseph, Harrison Hong, Ming Huang and Jeffrey Kubik, "Does Fund Size Erode Performance? Liquidity, Organizational Diseconomies and Active Money Management," Working Paper, September 2002 and May 2004 (forthcoming in the *American Economic Review*) <http://www-rcf.usc.edu/~josephsc/files/fundsize.pdf>
9. Chevalier, Judith and Glenn Ellison, "Risk Taking by Mutual Funds as a Response to Incentives" *Journal of Political Economy*, December, 1997.

10. Domowitz, Ian, Jack Glen and Ananth Madhavan, "Global Equity Trading Costs," ITG White Paper, May 8, 2001.
<http://www.itginc.com/research/whitepapers/domowitz/globaleqcost.pdf>
11. Edelen, Roger M., "Investor Flows and the Assessed Performance of Open-End Mutual Funds," *Journal of Financial Economics* 53, 1999, pp. 439 – 466.
12. Gastineau, Gary L., "Protecting Fund Shareholders From Costly Share Trading," *Financial Analysts Journal*, May/June 2004, pp. 22 – 32.
<http://www.etfconsultants.com/Protecting%20Fund%20Shareholders%20FAJ.pdf>
13. Gastineau, Gary L. and Craig J. Lazzara, "Reinventing the Investment Fund" from The Investment Think Tank: Theory, Strategy, and Practice for Advisers. Harold Evensky and Deena Katz, editors, Bloomberg Press, 2004, pp 153 – 178. Also appeared in *Bloomberg Wealth Manager* under the title of "Extreme Makeover," November 2004, pp. 57 – 68.
14. Goetzmann, William N., Zoran Ivkovic, and K. Geert Rouwenhorst, "Day Trading International Mutual Funds: Evidence and Policy Solutions." *Journal of Financial and Quantitative Analysis*, vol. 36, no. 3, September 2001, pp. 287 – 309.
15. Greene, Jason T., and Charles W. Hodges, "The Dilution Impact of Daily Fund Flows on Open-End Mutual Funds." *Journal of Financial Economics*, vol. 65, no. 1, July 2002, pp. 131 – 158.
16. Gruber, Martin J., "Another Puzzle: The Growth in Actively-Managed Mutual Funds," *Journal of Finance*, 51, 1996, pp. 783 – 810.
17. Hulbert, Mark, "The Big Mo in Stocks Hits a Wall of Trading Costs," New York Times, Strategies Column – Business Section, August 17, 2003.
18. Investment Company Institute 2004 Fact Book
http://www.ici.org/stats/mf/2004_factbook.pdf
19. Karceski, Jason, Miles Livingston and Edward S. O'Neal, "Portfolio Transactions Costs at U.S. Equity Mutual Funds," Zero Alpha Group, 2004
http://www.zeroalphagroup.com/headlines/Execution_Costs%20Paper_Nov_15_2004.pdf.

20. Keim, Donald B., "The Cost of Trend Chasing and The Illusion of Momentum Profits," Working Paper, July 29, 2003, The Wharton School, University of Pennsylvania.
21. Keim, Donald B. and Ananth Madhavan, "Transaction Costs and Investment Style: An Interexchange Analysis of Institutional Equity Trades," *Journal of Financial Economics*, 1997, volume 46, pp. 265 – 292.
22. _____, "The Cost of Institutional Equity Trades," *Financial Analysts Journal*, Volume 54, July/August 1998, pp. 50 – 69.
23. Peterson, Mark A. and Erik Sirri, "Evaluation of the Biases in Execution Cost Estimation Using Trade and Quote Data," *Journal of Financial Markets*, May 2003, pp. 259 – 280.
24. Schwartz, Robert and Reto Francioni, Equity Markets in Action: The Fundamentals of Liquidity, Market Structure and Trading, John Wiley & Sons, 2004.
25. Sirri, E.R. and P. Tufano, "Costly Search and Mutual Fund Flows," *Journal of Finance*, 53, 1998, pp. 1589 – 1622.
26. Stein, Jeremy C., "Why Are Most Funds Open-End? Competition and the Limits of Arbitrage," Working Paper, January 2004, Harvard University, <http://post.economics.harvard.edu/faculty/stein/papers/OpenEndJan04revision.pdf>
27. Zheng, L., "Is Money Smart? A Study of Mutual Fund Investors' Fund Selection Ability," *Journal of Finance*, 54, 1999, pp. 901 – 933.
28. Zitzewitz, Eric, "Who Cares about Shareholders? Arbitrage-Proofing Mutual Funds." *Journal of Law, Economics, & Organization*, vol. 19 (October 2003):245–280.