

Equity Index Funds Have Lost Their Way

A solution to growing problems.

Gary L. Gastineau

Peter Bernstein's history of the development and application of the great ideas of finance, *Capital Ideas* [1992], makes it clear that index funds were part of a broader plan. The unifying objective seems to have been to replace the traditional trust department dog-walking and stock-picking process with portfolios that had more diversification and a more "scientific" construction. Performance and diversification were as important as lower operating costs in the minds of many early practitioners of modern portfolio theory, but cost reduction was on the minds of all the early indexing advocates.

The first indexed portfolio launched in 1971 by Wells Fargo was created for a single pension fund client. In 1973, Wells Fargo organized a commingled fund for trust accounts. In 1976, the funds were combined, and the capitalization-weighted S&P 500 index was used as the template for the combined portfolios. By 1977, Wells Fargo had commissioned a study of the feasibility of moving beyond the S&P 500 to the Wilshire 5000.

It is one thing to persuade pension funds to adopt indexing. Introducing the idea to individual investors was an even more daunting proposition. The idea caught on with investors, thanks to some influential advocates.

In the first edition of his best seller, *A Random Walk Down Wall Street*, in 1973, for example, Burton Malkiel called for "a new investment instrument." He said:

What we need is a no-load, minimum-management-fee mutual fund that simply buys the hundreds

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of stocks making up the broad stock-market averages and does no trading from security to security in an attempt to catch the winners [1973, p. 226].

Paul Samuelson set down some arguments he had been making among the investment community in this Journal. He noted that, “The only honest conclusion is to agree that a loose version of the ‘efficient market’ or ‘random walk’ hypothesis accords with the facts of life” [1974, p. 17].

Samuelson questioned why no money management organization offered an unmanaged diversified fund to the public. He believed that this could be done at relatively modest cost, and that the fund would probably be a better repository for savings than most actively managed funds.

Less than a year later, Charles Ellis [1975] marshaled some simple facts illustrating that the institutionalization of the equity markets in the 1960s and early 1970s had made it probable that the *average* institutional investment manager would typically underperform the market as measured by a representative index. The costs of trading actively managed institutional portfolios and paying administrative expenses and management fees—combined with the increased institutional share of the market—left too little stock in the hands of non-professional investors to let amateurs fill up the ranks of underperformers. Average active institutional investors were inevitably going to underperform the unmanaged market indexes over time.

With the implicit or explicit support of Malkiel, Samuelson, Ellis, and others, John Bogle of Vanguard launched the first broad-market index fund for retail investors in 1975. Bogle was as motivated by the desire to reduce costs then as he is today.

Neither Bogle nor his supporters could have anticipated the success of indexing—or the costs that the index management and publication process would impose on today’s index fund investors.

THE ROLE OF THE INDEX PUBLISHER

One rarely discussed cost-saving feature that clearly attracted the indexing pioneers was access to the work of index publishers at very low cost. An index fund manager did not need a research department or conventional Street research. Most of the information necessary to “manage” an index fund was available at low cost from index publishers.

The earliest market indexes were developed as market benchmarks or performance measurement gauges. No one had index fund applications in mind. Any revenue from a license sold to an index fund was pure gravy for the publisher, and the fund’s implied endorsement of the index was helpful in making other licensing deals. The limited information available on early index fund licensing fees (which have typically been confidential) makes it clear that the index providers were not paid high rates to provide an index fund’s database and portfolio template.¹

The index publisher inevitably performed some administrative functions for a fund manager. The index rules determined when the index and hence the fund portfolio would be modified. In the early years, when index funds held a very small fraction of the capitalization of each stock in an index, there was little reason to be concerned about competition for a limited supply of shares when a change was made in the index. As index funds grew, investors and analysts began to pay attention to index membership effects. It became clear that index membership carried implications for a company’s stock performance.²

Low turnover of the index’s constituent companies was an inherent part of the indexing strategy. Tracking a low-turnover index with a fund that was growing at a modest, but steady, pace meant that the fund was buying stock relatively consistently and selling a few positions completely from time to time when stocks were dropped from the index. Portfolio turnover and its associated costs were quite low, and tax-efficiency was much better than active managers were achieving. If a stock experienced problems, its weight in the portfolio was its weight in the index, and no individual was blamed for the stock’s impact on fund performance.

The index fund pioneers had achieved a number of things at once: relatively objective portfolio selection criteria, cost savings in fund operations, the limited portfolio management direction they needed, low trading costs from low portfolio turnover, and a high degree of natural tax-efficiency. We have found nothing in the early indexing literature to indicate that the tax-efficiency of index funds was anything other than serendipitous, suggesting that it is possible to be lucky and smart at the same time.

No one can do more than roughly estimate the total assets of indexed portfolios in the United States today. If a manager does not announce that a portfolio is tracking an index, there is no basis for the index publisher to collect a license fee. This simple statement suggests that

most estimates of indexed assets are likely to be low.

Morgenson [1997] cites an S&P estimate that 8% of the U.S. stock market's capitalization was indexed, presumably as of the end of 1996. Given the S&P 500's dominant share of U.S. large-capitalization index funds and the continuing growth in the Vanguard S&P 500 fund, the SPDRs, and other S&P 500-indexed portfolios through the end of 2000, it is a safe assumption that at least 10% of the shares of any stock in the S&P 500 index are now held in an S&P 500 indexed portfolio.

There are higher estimates for the market share of indexing. Bernstein [1992], for example, uses 30% for institutional portfolios.

The precise figure is not critical for our purpose, because some "passive" portfolio managers take their time adjusting portfolio composition to changes in index composition. The important point is that it is safe to assume that at least 10% of the shares of any stock in the S&P 500 are held by committed indexers who change their portfolio at approximately the same time that the index changes. These hard-core indexers are part of the problem of growing transaction costs in index funds.

RECOGNITION OF INDEX FUND TRANSACTION COSTS

Enough has been said and written about the turmoil frequently associated with constituent changes in the S&P 500 and the Russell 2000 indexes that there is no need to reprise the stories here.³ Several general comments are in order, however. Most observers agree that market-roiling episodes associated with index changes were at their worst in 1999 and 2000, and that some of the most serious incidents involved S&P 500 stocks with restricted floats. The appropriate way to analyze and evaluate the effect of these index changes on indexing portfolios is to view them as transactions and to try to measure their costs as we would measure the transaction costs incurred by an active portfolio manager.

We have encountered two common reactions to discussions of the transaction costs that indexed portfolios incur when they trade to match changes in the index. The first reaction is that there are no transaction costs. The argument goes something like this. If an index fund manager modifies an S&P 500 portfolio with market-on-close orders on the day the index change is effective, the portfolio will track the index perfectly. Unless the fund pays a commission or makes its transactions at some time other than at the market close on the day the index

changes, fund performance in terms of index tracking will not be adversely affected by any transaction costs. One weakness in this argument is that there are nearly always opportunities to transact at better prices from before the announcement of an index change up to a week or so after the index change becomes effective.

As evidence that there are transaction costs associated with an index change, some indexers—Vanguard is the most widely discussed—regularly outperform the S&P 500 by trading at different times from the moment of index change.⁴ They capture some of the transaction costs embedded in the index reconstitution process and improve on the index return for their shareholders. Some managers indicate privately that they capture up to 100 basis points per year in the Russell 2000 reconstitution. The resulting favorable tracking error enhances the fund's performance and increases the popularity of the Russell 2000. Indexers as well as active managers prefer the Russell 2000 as a small-cap benchmark because the embedded transaction costs make it easy to beat.

Investors have widely varying attitudes toward tracking error. Some passive investors are willing to live with tracking error when their portfolio is compared to the index. To reduce transaction costs, they often evaluate blocks of stock that are bid for and offered in the market, and buy or sell only when their measured transaction cost is negative. They are providing liquidity for an anxious party on the other side of the trade, and generally outperform their benchmark index. This kind of patient trading can be particularly effective with smaller stocks.⁵

For marketing and sometimes for legal reasons, many index fund managers are constrained in their ability to deviate from precise index replication. These managers tend to trade when the index "trades."

The most common reaction to the notion of index fund transition/transaction costs is agreement that transaction costs are present in an index change, and that they should be measured by taking the difference between prices at the time of the index change announcement and closing prices on the day of the official index change. This is a sensible approach.

The most widely used measures of transaction costs start the cost measurement clock running when the decision is made to trade. In their simplest form, these measures incorporate the net price change and any commissions in the trading cost calculation. The indexer's decision to trade is "made" when the index change is announced. While the first opportunity to trade is at the next day's opening, a better case can be made for using

the closing price just before the announcement as the starting point.

The greatest problem with either of these starting points for a transaction cost calculation is the growth of a cottage industry that attempts to anticipate changes in the indexes before they are announced.⁶ At any time a company is scheduled to leave the S&P 500, there are probably 10 to 20 serious candidates to replace it. Some of these can be set aside or moved higher on the list for one reason or another.

If a candidate is in the same industry as the departing company or in an underweighted industry, it is more likely to be chosen than another company of similar size that S&P has also used in its smaller-cap indexes. If a company is in the S&P 400 (mid-cap) index, it is more likely to be chosen than a similar company that S&P has not used in its indexes before. If a company is a recent IPO without earnings, it is less likely to be promoted to the S&P 500 unless its capitalization is too large to ignore.

The effort to predict the next addition to the index can lead to transactions and price impact on the new index member's shares well ahead of the index change announcement, creating a situation that does not fit easily into a transaction cost analysis framework for any of several reasons:

- The preannouncement anticipatory trading has no determinable starting date or price.
- S&P mid-cap 400 index stocks have lower apparent transition/transaction costs when they move to the S&P 500 because their candidacy is more likely to lead to selection and to more competitive early purchasing, and because mid-cap indexed portfolios will sell the shares when they leave that index for the S&P 500.
- It is probably impossible to separate these transition/transaction costs from the traditional S&P 500 membership effect—and it is not clear that we should try to separate them.

Setting aside the difficulty of estimating the transition/transaction costs with precision, there clearly are incremental transaction costs relative to other ways of reconstituting an indexed portfolio. Looking at the price changes in other ways demonstrates that there are very real trading costs associated with an S&P 500 index change.⁷

We need to focus on the probable size of these transaction costs relative to the total expenses of a fund, accepting the principle that a rough estimate is better than

no estimate at all. The problem of measuring these usefully and consistently needs more attention, including attention to the cost of trading stocks that stay in the index but are reweighted as a result of index changes.

COMPARING COSTS OF INDEX FUNDS

We illustrate the cost of some different indexing techniques by comparing two pairs of funds—one large-cap pair and one small-cap pair—constructed and run along radically different lines. In the Exhibit, we attempt to compare hypothetical relative cost-efficiencies of two pairs of exchange-traded funds. One fund in each pair is based on a benchmark index and the other on a fund-friendly index designed specifically to replace the benchmark in fund applications.

In the first comparison of the S&P 500 to the “Fund-Friendly 500,” the latter has enough companies to cover 85% of the U.S. market as measured by capitalization of publicly traded companies with a market value of over \$100 million. This works out to be just over 500 companies. It is worth noting that the S&P 500 includes only about 75% of U.S. companies by capitalization.

The second comparison pits the Russell 2000 against a “Complementary” Small-Cap Fund-Friendly index, which includes the remainder of the U.S. corporate equity capitalization from the largest U.S. company not included in the Fund-Friendly 500 down to the \$100 million capitalization level.

The two fund-friendly indexes cover all U.S. publicly traded companies with capitalizations of over \$100 million, or more than 99% of total U.S. equity market capitalization. The new fund-friendly indexes are float-weighted with annual rebalancing and various rules designed to reduce turnover.

We assume the benchmark index funds have two apparent advantages over the fund-friendly index funds. The expected fund expense ratios for the benchmark index funds are lower, and the cost of trading the fund shares/index basket (which is in large measure a function of the standardization of the portfolios) is presumed to be lower for the benchmark index funds than for the fund-friendly index funds.

Focusing on the large-cap funds, the expense ratio on the S&P 500 fund is assumed to be 10 basis points (reflecting the expense ratios of 9.45 basis points on the iShares S&P 500 Fund and 12 basis points on the SPDRs), while the Fund-Friendly 500 is assumed, at least initially, to be a smaller fund. With fewer assets to spread expenses

EXHIBIT
HYPOTHETICAL ANNUAL INDEX FUND COST COMPARISONS—
BENCHMARK VERSUS FUND-FRIENDLY INDEXES (BASIS POINTS)

Fund Cost Element	S&P 500	“Fund-Friendly 500”	Russell 2000	“Complementary Small-Cap”
Fund Expense Ratio	10 bp	20 bp	25 bp	30 bp
Fund Transaction Costs				
Annually (index efficiency)	50 – 100	Less than 25	200 – 300 ^c	Less than 100
Index Membership Effect ^a	?	?	?	?
Value Added by Fund Manager ^b	?	?	?	?
Annual Range of Determinable Cost Elements	60 – 110	Less than 45	225– 325	Less than 130
Cost of Trading Fund Shares	10	20	20	30

^aHistorically, there has been a positive effect on the performance of stocks when they join the S&P 500 and, based on activity connected with the annual reconstitution, when they join the Russell 2000. There also has been an ongoing S&P 500 membership effect, probably as a result of the growth in indexing. If the arguments we make here have any impact, the ongoing S&P 500 membership effect should be a historic artifact.

^bAggressive index fund managers have traditionally added value by trading at a different time from the official moment of index change. By doing so, they have recovered part of the annual transaction costs. Looking at the performance of Vanguard and others, the best managers seem to have recovered 10%–20% of the transaction costs in the S&P 500 and as much as one-third of the Russell 2000 transaction costs. This transaction cost recovery relative to the formal index value is not a zero-sum game. More managers should be able to beat the benchmark index (before expenses) than underperform the index. This opportunity to recapture transaction costs will largely disappear when the fund-friendly indexes are adopted.

^cPart of the evidence for the extremely high rebalancing cost of the Russell 2000 is the finding by Julian [2001] that the stocks graduating from the Russell 2000 to the Russell 1000 in 1990 had a return of 15.6% through the end of 2000 versus the 11.8% return on the Russell 2000 itself. It is not possible to divide this outperformance between the superior performance of the stocks that “graduated” from the 2000 to the 1000 that year and the transaction costs associated with the annual reconstitution, but there is widespread agreement that the annual cost of the reconstitution has been rising as use of the Russell 2000 as a small-cap fund template has grown.

over, we assume an expense ratio of 20 basis points. We could assume that the manager of the new fund would match the expense ratio on the S&P 500 funds, but the manager might decide instead to stake the case for the new fund on performance after full expenses.

The trading spread for an S&P 500 standardized basket or for comparable fund shares has recently averaged around 10 basis points. Although the Fund-Friendly 500 should track the S&P 500 very closely most of the time, we assume that the trading spread for these shares—until the new basket becomes widely accepted—will be about 20 basis points. Fund and basket trading cost differences are unlikely to be materially greater than the Exhibit indicates because of the inevitable close correlation of the two large-cap indexes and the larger average size of the significantly weighted companies in both of the fund-friendly indexes. With an aggressive specialist, the new fund shares might match the trading spread on competitive benchmark funds from the beginning.

Certain other effects, such as any index membership effect and the value added by a fund manager in timing

transactions differently from those required in the index rules, we treat as unknowns. There is reason to believe that the net of these effects, in contrast to some past periods, might favor the fund-friendly indexes, but any effects should be modest in either case.

The remaining difference between the two indexes in each index pair is in the expected internal fund transaction costs. In the case of the benchmarks, the 50 to 100 basis point estimate for the S&P 500 and the 200 to 300 basis point estimate for the Russell 2000 are rough estimates for recent annual transition/transaction costs for funds based on these indexes. Trading costs to modify and rebalance S&P 500 portfolios probably exceeded 100 basis points in 1999 and ran closer to or even below a 50 basis point annual rate for the first nine months of 2001. The actual transaction costs may average higher than the estimates if index managers underestimate the importance of market impact *on both sides* of an index fund internal reconstitution transaction.

When a new company is added to the S&P 500, the nature, if not the precise magnitude, of the market impact

on the stock of the new company is obvious. Less clear, but often quite important, is the market impact on the other side from transactions in the stock that is eliminated from the index and in the 499 other stocks whose weights are changed. The transactions on both pieces of the trade occur at a time and in an environment where they represent one-way transactions.

There is likely to be greater market impact in a known one-way transaction than in a randomly timed transaction. These are one-way transactions because many investors want to change their position in specific stocks in the same way at about the same time. Natural liquidity providers tend to be scarce at such times.

The very low transaction cost estimates for the two fund-friendly indexes reflect the fact that these new indexes are designed to minimize transactions at all times and to offset as much transaction cost as possible by trading between complementary fund portfolios at the annual fund rebalancing. An S&P 500 fund will engage in a large number of relatively small rebalancing transactions over the course of a year. Transaction costs are incurred regularly instead of being largely offset in an annual rebalancing that ideally consists of non-impact trading between complementary funds.

In the case of the Russell 2000, the greater relative (to capitalization) popularity of the Russell 2000 than the Russell 1000 means that the market impact of transactions to rebalance the Russell 2000 is much greater than in its complementary large-cap index, the Russell 1000. Also, in contrast to the Complementary Small-Cap index, the Russell 2000 is a middle-range index in the sense that it gains and loses some sizable companies not only at the top, but also at the bottom. Rather than being representative of a capitalization range, it accepts a fixed number of companies each summer. This structure leads to a 25% to 30% annual turnover at rebalancing. Because of the weighting disparity in the use of the Russell 1000 and the Russell 2000 in indexed portfolios, this turnover is reflected in the 200–300 basis point estimate of embedded annual transition/transaction costs for the Russell 2000.

The fund-friendly indexes are fully complementary. The Fund-Friendly 500 would cover the largest 85% of the capitalization range, and the Complementary Small-Cap index would cover the remainder. At the bottom of the small-cap index, the impact of interaction with companies moving up from below the \$100 million capitalization range or down into it would be relatively modest, and—with a buffer capitalization range between the small-cap and large-cap indexes—turnover would be well below

the annual two-way migration between the Russell 1000 and the Russell 2000.

If a fund issuer were responsible for both large-cap and small-cap funds with proportionate capitalizations, or if the overall adoption of the two indexes were approximately proportional to their capitalization weights, the market impact of the rebalancing transactions involving switches between large-cap and small-cap would be negligible on the combined funds—making the transition/transaction costs even lower than the estimates in the Exhibit. Even if the adoptions were not ideally weighted, it would be a long time before market impact costs approached recent levels for the S&P 500 and the Russell 2000, because one feature of the fund-friendly index rules in this application is that index changes are not announced until after a fund has traded.

Given the cost saving opportunities that development of such indexes appears to offer an index fund, product developments along this line seem inevitable. Indexers will surely want to return to the low transaction cost environment of their early years.

THE OUTLOOK FOR INDEX TRANSITION/TRANSACTION COSTS

The dominant portion of the transaction costs that S&P 500 and Russell 2000 index funds experience is attributable to all the competition that funds indexed to these benchmarks have whenever they need to transact. From the time index funds were introduced until a few years ago, market impact costs from index modifications were a non-issue for index fund managers. The success of indexing, and, consequently, anticipating and trading in competition with other index fund reconstitution trades, is the direct cause of the growing magnitude of these transaction costs.

Only the end of growth in equity fund indexation or a radical change in the indexes used (and how they are used) will keep the benchmark index fund internal portfolio transaction costs illustrated in the Exhibit from continuing to grow.

The indexing process must change. The index fund manager needs an index that has modification rules that are *as independent as possible* from the rules used by other indexers operating in the same general market space (e.g., large-cap, small-cap, sector, or style). We will elaborate on this point and offer a new operating format for index funds to use the modified indexes most efficiently.

Index Transparency—Unnecessary in Today's Index Funds

The public at large has been fully aware of any changes scheduled to be made in an index fund portfolio before the index change is implemented. This is not to say, of course, that the manager of the index fund will make the change at the close of trading on the day that the index changes. Even the “manager” of the original SPDR had considerably greater flexibility than an exact timing match of index and fund changes.⁸

Within some period, usually beginning about a week before the date of the index change, the world at large knows that a change will be made in an S&P index, and that the corresponding change in the fund will be made either shortly before, at, or shortly after the market close when the index change becomes official. Astute index managers have frequently (in some cases, consistently) traded early or late to avoid the crush at the market close on the day the index itself changes, so there is nothing new in making the change at a time selected by the manager.

Yet, whether the management of a fund is based on a set of index rules or on the stock-picking judgment of a fund manager, there is no reason why *anyone other than the fund manager* needs to know when the index change or fund change will be made or even what the change will be. This is a version of indexing not widely discussed, so it will take some getting used to.⁹

Indexing was developed to create a fund that represents all or an important and consistent segment of the market without using traditional stock selection techniques that lead to high turnover. The index never needed to be constructed in a fishbowl and published before the fund acted. Investors cared about the general characteristics of the fund, not its specific portfolio. Publication of index changes before fund portfolio changes puts the fund and its shareholders at a disadvantage if a large number of investors want to act in the same way at the same time.

The pioneers of indexing used benchmark indexes because they were available; they could be licensed cheaply; and they seemed to be more objectively determined than some of them have turned out to be. At the time they were introduced, index funds were such a small factor in the market that no one thought about the market impact cost of making an index fund portfolio change when the index changed. Markets have changed, though, and indexing has become too popular for us to continue to operate in the old way.

The principle of confidentiality of fund trading plans until after the trade is complete has served active managers well. It also works well in a new breed of index fund that attempts to eliminate unnecessary transaction costs.

New and Improved Index Funds

The characteristic of portfolio change that defines current index funds is that, before the index change date arrives, there is widespread knowledge that the fund will trade to match the index change. The index provider determines and publishes what the fund will have to buy and what it will have to sell. In other words, knowledge of the pending index change belongs to the world, not exclusively to the fund.

Active fund managers go to great lengths to keep their intentions and transactions confidential until long after a trade has been executed. With the exception of some pressure to report the positions they have already taken more promptly after the trade, no one argues that an active manager should have to disclose more about trading activity. No one suggests the active manager announce plans to buy one stock to replace another before the trade has been completed. The result of the active fund manager's transaction may not be made public for months, even after some proposed changes to accelerate portfolio disclosure are implemented.

The current index investing principle requires that the manager of a fund tracking a benchmark index not even find out about a change in the index before the change is announced to the world. The more popular and widely used the index, the more managers and scalpers will be trying to implement the same index change at about the same time. In fact, the more popular the index, the more traders who will be trying to make a similar trade before the index fund manager—perhaps attempting to reverse their positions at a profit when the index fund manager makes the trade.

Such procedures make some sense if an index is used for many purposes, but there is no reason any index fund must be based on a widely used index—if using that index for the fund harms the fund's investors by raising the fund's transaction costs, and causes the index and the fund to underperform a similar fund based on less congested index transition rules.

The higher reconstitution transaction costs for funds based on the benchmark indexes in the Exhibit happen largely because other indexers and other investors enter orders to make similar portfolio changes at about the

same time as the fund trades. Financial industry procedures and, to a limited extent, regulations on index change disclosure have unnecessarily and inappropriately required identical treatment and preannouncement of index information, whether the index is a major benchmark index or a custom index developed for a single fund.

Disclosure before the index change is effective is certainly necessary and appropriate for major benchmark indexes—but there are very few major benchmark indexes among the tens of thousands of equity indexes calculated daily. Disclosure is not appropriate, necessary, or even desirable for a fund-specific index. If indexing had started with customized fund indexing rather than benchmark indexes, publication of changes in the index used by a fund before the fund trades would never have been an issue—and properly measured reconstitution trading costs for most index funds would be far lower than they are today.

Even if changes, annual reconstitutions, and/or rebalancings in major benchmark indexes have to cause trading frenzies, there is no reason less prominent indexes have to announce and implement their changes in the same manner. The shareholders of a fund based on a custom index do not need to know the precise index rules for handling a corporate action any more than shareholders in an actively managed fund need to know (or get to know) exactly how their manager will react to an earnings report or a management change. If an index is designed to be fund-friendly—in this case, to reduce the fund's transaction costs—it could be very advantageous to the fund's shareholders, and not adversely affect other parties with legitimate interests, to announce index changes only *after the change* has been implemented by the fund.

This fundamental change in the revelation of index changes has surprisingly few implications for how indexes are used for purposes other than as templates for index funds. If the implementation of a fund's index is reflected in the fund portfolio, the changes in the fund's net asset value are the best measure of changes in the index. The fund might be required to publish information on conformance of its implementation with the rules it adopts for its index, but derivatives on the fund shares and on the NAV-based index could trade without advance notice of index/portfolio changes.¹⁰

The Self-Indexing Fund— Daily Portfolio Disclosure

A form of exchange-traded fund structure that we call the *self-indexing fund* (U.S. patent applied for) was

originally devised as an actively managed ETF structure. It turns out to be the best mechanism for reducing reconstitution/transaction costs in an index fund as well.¹¹

The self-indexing fund manager establishes the initial composition of the index by purchasing an initial portfolio or by accepting an initial deposit meeting certain specifications. The basis for the initial deposit and for subsequent changes in the fund may be a formally calculated but unpublished index, or it can be a portfolio basket developed using *any* of the traditional techniques of active portfolio managers or new techniques devised by the manager or by others.

The template index for an index fund will be of interest to anyone who would measure how the fund's manager tracks it and how the template index performs relative to standard benchmark indexes covering, e.g., the same capitalization range, style, or sector. While there is room to add value with sound trading judgment, there will not be scope for an index-based fund manager to beat the template index by trading more astutely than other fund managers using the same index because the manager will be the only fund manager using this specific index.

By avoiding the periodic trading frenzies of conventional indexing, the new fund indexes and the new funds should beat the benchmarks by a wider average margin than the most effective conventional index manager can beat the benchmark index. This change in procedure reduces the fun and challenge of being an index fund manager, and suggests a shift in intellectual resources to index rule design. Ironically, under these circumstances, the better index fund managers may be more reluctant than their less effective competitors to adopt the new process; but the greater transaction cost savings from the new indexing implementation should assure long-term out-performance by the new funds.

The template index would be used (and its performance published) to reflect the index tracking record of the manager. The performance of the fund will also be evaluated against standard benchmark indexes covering similar market space. For most purposes, however, it is the implementation in the fund that matters going forward. For this reason, and because the self-indexing fund is also a suitable vehicle for an actively managed fund, subsequent references to “an index” are to the self-indexing fund index based on the fund's NAV.

The portfolio is offered to investors in the form of ETF shares, and the initial and subsequent values of the ETF shares are published as a self-indexing fund index that can be used for the same purpose as any other equity

index. The value of the self-indexing fund index is determined by changes in the NAV of the fund shares.

The fund manager changes the composition of the fund index by selling some of the components of the portfolio and/or buying new components for the portfolio. The fund manager discloses the self-indexing fund portfolio daily, and posts a creation basket and a redemption basket for public dissemination *shortly after the market closes each business day*. The fund creates additional fund shares by issuing them in exchange for deposits of portfolio components in multiples of the daily creation basket, and redeems fund shares by accepting multiples of a preset number of fund shares in exchange for portfolio components in the form of like multiples of the daily redemption basket.

The creation and redemption process is quite similar to the process for current equity index ETFs. The principal difference is that the “authorized participant” (the market maker or investor who creates or redeems fund shares) usually notifies the fund’s distributor of plans to create or redeem fund shares earlier in the trading day than notice is required for most equity index ETFs. The earlier notice permits the manager of the self-indexing fund to defer selling stock that is needed to be delivered as part of the posted redemption basket, and to sell incoming shares from creation baskets as shares in the same stocks are sold to change the fund portfolio. Changes in the portfolio today are not reflected in net asset value until the next business day, so the creation basket will be an excellent hedging portfolio for market makers right up to the market close.

Intraday index calculations are identical to capitalization-weighted index calculations, and the weights are the portfolio weights used in that day’s NAV calculations. If the fund holds a cash balance or is leveraged, the index will include a cash component (which presumably earns interest) or will be leveraged.

In short, the index fully reflects the fund’s investment characteristics and investment process.

CONCLUSION

Unlike today’s exchange-traded equity index funds, which attempt to create a portfolio to track the performance of a benchmark index, the fund-created index has the essential characteristics of the fund-friendly, non-disclosed, index used as a template or pattern to construct the exchange-traded index fund. The self-indexing fund operates as index funds should always have operated—in the exclusive interest of the fund’s shareholders.

The self-indexing fund index can be used as a basis of comparison with other funds and their managers and with other indexes. It can serve as the basis of a family of derivatives that can be based either directly on the fund (physically settled) or on the index created by the fund (cash-settled). Through the creation of its index and disclosure of changes in the self-indexing fund and/or index, the self-indexing fund will report its portfolio and/or index changes within a few hours after the market closes on each business day when a portfolio change occurs.

ENDNOTES

¹The 2001 trial court decision in *McGraw-Hill Companies vs. Vanguard Index Trust et al.*, on introduction of exchange-traded share classes, indicates that the license fee Vanguard pays S&P is capped at \$5,000 per year. This figure is more correctly stated as \$50,000 per year (still a relatively low amount) in Lucchetti and Lauricella [2001]. Compare this to the more recently negotiated index license fee for the 500 SPDRs, which is generally estimated to be approaching \$10 million per year.

²See Jacques [1988] and hundreds of articles and brokerage firm reports published since.

³See Gastineau [2002], Chapter 6.

⁴See, for example, Bogle [1999], p. 134.

⁵See Sinquefeld [1991] for an excellent discussion of the advantages of patient trading.

⁶See, for example, Garnick et al. [2001].

⁷See, for example, “Is Eliminating Tracking Error Hazardous to Your Client’s Wealth?” [2001], which measures average price changes relative to preannouncement prices or effective membership prices.

⁸See “The Portfolio—Adjustments to the Portfolio,” in the SPDR Prospectus [2001].

⁹Some passive managers are not slavish adherents to an index. They are willing to delay reconstitution trades indefinitely, and implement them with cash flow from dividends and new investments in the fund. This is a different process from what we describe here, however, because it offers the manager very wide discretion. The process we describe retains the manager’s flexibility within a narrow time interval, but reduces the transaction costs associated with tracking the index closely. It reduces costs by avoiding concentration of multiple index fund orders within a short period.

¹⁰There may be regulatory reluctance to embrace cash-settled derivatives on an index with changes that are not disclosed until after a fund that both creates the index and is based on it has transacted in its portfolio. This is not a major issue. There can be no such objection to derivatives that settle in fund shares, and they are likely to be the most popular derivatives anyway.

¹¹For more information on the self-indexing fund, see Gastineau [2002], pp. 189–200.

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