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Indexing with Small Cap Stocks- A Sure Way to Pick the Losers

Research Report

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Mark P. Hurley
James L. Kaplan, Ph.D.
Thomas G. Fuller
Yvonne N. Kanner
Thomas M. Jiede
Danielle L. Drechsler

Mark P. Hurley is President and CEO of Undiscovered Managers, LLC. James L. Kaplan is President and CEO of J.L. Kaplan Associates, LLC. Thomas G. Fuller is a Senior Research Analyst and Principal of Undiscovered Managers, LLC. Yvonne N. Kanner is a Vice-President and Principal. Thomas M. Jiede is a Summer Associate and Danielle L. Drechsler is an Intern with the firm.

Active versus passive management has been widely debated in the investment community. Given that much of modern portfolio theory is based on the Efficient Market Hypothesis, is it reasonable to believe that an active money manager can consistently outperform an appropriate benchmark after including all transaction costs and fees?

"Yes" has historically been the answer given by investors, who have allocated a vast majority of their assets invested in equities to active managers. However, based on the massive money flows into index funds during the last half of this decade, the market's perception of passive investing is changing.

Both institutional and individual investors have increased their allocation of assets to passive management over the past five years. More than $195 billion was invested in index mutual funds alone as of June 1998.[1] Index funds' share of the exploding mutual fund market doubled between 1995 and 1998 and it has continued to grow as the market has narrowed.[2]

Performance Pushes Investors to Large Cap Indexing

A major cause of this shift to index funds has been performance. Only 31.6% of active, separate account managers that RogersCasey Investworks identified as using the S&P 500 Index as their benchmark matched or beat the index on a gross basis from June 30, 1993 to June 30, 1998. On a net basis, the results are much more dramatic. As shown in Exhibit A, if you subtract the average expense ratio of large cap mutual funds (135 basis points), on average, only 15.1% of large cap managers beat the S&P 500.

Additionally, of those managers who beat the S&P 500 net of fund expenses during the five-year period, most did it by a small margin. Only 6.4% beat the index by at least 150 basis points and only 2.2% beat it by at least 500 basis points. Clearly, given the likelihood that most active managers will not deliver a net return greater than the index (and only by a small amount if they do), this shift to indexing during the recent bull period seems logical.

Exhibit A

S&P 500 Index Beats Most Active Managers [3]
Net of Average Mutual Fund Expense Ratio
June 1993 to June 1998

	Percent of Active Managers Beating Benchmark		
% Points Above Benchmark	**1 Year Period**	**3 Year Period**	**5 Year Period**
0.00	31.1%	18.6%	15.1%0
1.50	22.9%	9.8%	6.4%
2.50	18.8%	7.8%	3.6%
5.00	8.9%	2.1%	2.2%
7.50	5.3%	1.6%	1.4%
10.00	3.4%	1.0%	1.4%

Indexing Success Doesn't Translate to Small Cap Investing

While the shift to indexing in large cap stocks is supported by the poor relative performance of active managers, the picture is quite different for small cap stocks. Gross of fees, 82% of active, separate account managers using the Russell 2000 Index as their benchmark matched or beat the index during the five-year period that ended June 30, 1998. Subtract the average expense ratio for small cap mutual funds (158 basis points) and active management still paid off. As shown in Exhibit B, on average, 70% of small cap, active managers beat the Russell 2000 net of fund expenses, and a significant percentage beat the index by substantial margins.

Exhibit B

Most Active Managers Beat Russell 2000 Index [4]
Net of Average Mutual Fund Expense Ratio
June 1993 to June 1998

	Percent of Active Managers Beating Benchmark		
% Points Above Benchmark	**1 Year Period**	**3 Year Period**	**5 Year Period**
0.00	48.7%	74.2%	70.0%
1.50	44.7%	64.5%	55.0%
2.50	41.3%	57.3%	42.0%
5.00	29.3%	37.1%	17.0%
7.50	17.3%	19.4%	6.0%
10.00	10.0%	8.9%	2.0%

More than 50% of active managers during the five-year period beat the index by an average of at least 150 basis points per year. Annually, 17% of managers beat the index by at least 500 basis points and 6% of managers beat the index by at least 750 basis points.

As successful as indexing has been in the universe of large cap stocks, active management has been just as successful in the universe of small cap stocks. Even from 1991 to 1993, the last long-term period in which the Russell 2000 significantly outperformed the S&P 500, 54% of active managers still beat the Russell 2000 net of their average expense ratio.[5] Does this discrepancy mean that small cap managers are necessarily better than large cap managers? Probably not.

One explanation for this difference is that information about small cap stocks is harder to obtain – stocks in the S&P 500 are covered by an average of 16 analysts, compared to 4 for stocks in the Russell 2000[6] – and that good managers can exploit this inefficiency. Style drift is another possible explanation. If a small cap manager allowed 5% of his portfolio to "drift" and become mid cap stocks, and those mid cap stocks outperformed small cap stocks by 6% per year, he would gain 0.3% per year on the Russell 2000. Clearly, however, style drift alone cannot explain why such a great percentage of active managers have outperformed the Russell 2000.

A third, often overlooked explanation for why active managers are so successful against the Russell 2000 lies in the way the index is constructed.

The Reverse Survivorship Bias

To better understand why the difference in relative performance between large cap managers and small cap managers exists, we examined how stocks are selected for inclusion in the S&P 500 Index and the Russell 2000 Index. We found that they are constructed very differently.

Standard & Poor's Corporation, which oversees the S&P 500 Index, has considerable flexibility in constructing its index. Holdings are diversified across a broad range of sectors and analyzed for liquidity and long-term stability – in addition to being evaluated by market capitalization. Mergers and bankruptcies are grounds for expulsion from the index, while restructurings are grounds for prompt reevaluations. Stocks are added and subtracted one at a time at the discretion of Standard & Poor's. And the 500 largest publicly traded companies in the United States don't necessarily comprise the index.[7]

By comparison, the Russell 2000 Index is based exclusively on market capitalization. It is composed of the 2,000 smallest of the 3,000 largest publicly traded companies based in the United States. The Frank Russell Company reconstitutes the Russell 2000 every June 30th (based on May 31st market capitalizations), replacing companies that no longer fit in the required market capitalization range with those that do.[8]

We believe that the method of selecting stocks for inclusion in the Russell 2000 contains a "reverse survivorship" bias – that is, the losers survive and the winners depart. In order to support this thesis, we compared how stocks kicked out of the Russell 2000 have performed relative to the actual index by constructing several different, new indices.

Stocks Kicked out of the Russell 2000 Index Produce Greater Returns than the Russell 2000 Index

First, we constructed a benchmark that consisted of companies kicked out of the Russell 2000 between June 30, 1993 and June 30, 1998. The benchmark was reweighted annually according to market capitalization (the Russell 2000 is also reweighted annually). Companies that returned to the Russell 2000 in later years were counted as part of the "kicked-out" index only as long as they remained out of the Russell 2000. For example, if a stock was kicked out of the Russell 2000 on June 30, 1993 and returned to the index on June 30, 1995, it was only counted as part of the index of "kicked-out" stocks for those two years.

Exhibit C

Stocks Kicked Out of the Russell 2000 Index Produce Greater Returns Than the Russell 2000 Index [9]

Returns Weighted By Market Capitalization

Portfolio	1993-94	1994-95	1995-96	1996-97	1997-98	Cumulative Return	Annualized Return
Russell 2000 Index	2.97%	18.04%	24.00%	15.84%	16.80%	103.92%	15.32%
Stocks kicked Out of Russell 2000 Index	5.68%	40.47%	23.79%	11.89%	21.00%	148.77%	19.99%
Outperformance vs. Russell 2000 Index	2.71%	22.43%	(0.21%)	(3.95%)	4.20%	44.85%	4.67%

A portfolio consisting of companies "kicked out" of the Russell 2000 produced a cumulative return of 148.77% for the five-year period that ended June 30, 1998. The actual Russell 2000 produced a return of 103.92%.

Holding the Russell 2000 Index Constant Produces Greater Returns

We also constructed a second set of benchmarks by holding the Russell 2000 for a given year constant – i.e. we took the companies in the June 1993 to June 1994 Russell 2000 and looked at how they performed from June 1994 to June 1998. We did the same thing for the 1994 to 1995, 1995 to 1996 and 1996 to 1997 Russell 2000 indices. The benchmarks were reweighted annually by market capitalization.

Exhibit D

Holding the Russell 2000 Index Constant Produces Greater Returns Than the Russell 2000 Index [10]

Returns Weighted By Market Capitalization

Russell 2000 Index Year	1994-95	1995-96	1996-97	1997-98
1993-1994	22.98%	24.88%	19.68%	18.60%
1994-1995	--	24.28%	17.76%	20.26%
1995-1996	--	--	16.09%	17.98%
1996-1997	--	--	--	18.18%
Actual Russell 2000 Index	18.04%	24.00%	15.94%	16.80%

- Had the Russell 2000 of 1993 to 1994 been held constant, it would have produced an annualized return of 21.51% from June 30, 1994 to June 30, 1998. The actual Russell 2000 produced an annualized return of 18.70% during the same period.

- If the 1994 to 1995 Russell 2000 had been held constant, it would have produced an annualized return of 20.74% during the three-year period that ended June 30, 1998. The actual Russell 2000 produced an annualized return of only 18.88% per year.

- Had the Russell 2000 of 1995 to 1996 been held constant, it would have produced an annualized return of 17.03% from June 30, 1996 to June 30, 1998. The actual Russell 2000 produced an annualized return of only 16.32% per year.

- A portfolio consisting of companies in the 1996 to 1997 Russell 2000 would have produced a return of 18.18% during the 12-month period that ended June 30, 1998. The actual Russell 2000 returned only 16.80%.

These results show that the Russell 2000 is clearly plagued by a reverse survivorship bias born of its inability to react to changes in the market. Because the index is reconstituted solely on the basis of market capitalization – and only once each year – it is less representative of a dynamic, quickly changing market than those indices that have the flexibility to respond to evolving conditions. It is analogous to trying to use a snapshot to capture a fast moving event.

Market Capitalization As the Sole Measure of Quality– Cause of the Reverse Survivorship Bias

We believe that the major cause of the reverse survivorship bias in the Russell 2000 is its use of market capitalization as the sole criteria for membership. As a result, many of the best companies in the index grow out of the benchmark and move into the Russell 1000 Index – the index of the 1000 largest U.S. companies ranked by market capitalization. The Russell 2000 also holds some of its biggest losers for extended periods of time before they get small enough to fall out of the bottom of the index.

America Online Incorporated (AOL), for example, generated a return of 376% from June 1993 to June 1995 while it was in the Russell 2000. By May 1995, however, its market capitalization was too great to remain in the index. It was moved into the Russell 1000 and proceeded to generate a return of 855% over the next three years. PeopleSoft Incorporated (PSFT), another example of a big winner the Russell 2000 was unable to hold, produced a return of 253% from June 1993 to June 1995. By May 1995, however, it was also moved into the Russell 1000 and generated a return of 593% over the next three years.[11]

Total reliance on market capitalization also does not allow the Russell 2000 the flexibility to remove stocks that are past their peak price and clearly on the decline. For example, the index held three companies that depreciated at least

66.9% from June 1993 to June 1998. Geotek Communications Incorporated (GOTKQ) had a five-year cumulative return of –97.9%. Zenith Electronics Corporation (ZETHQ), which returned –95.8%, and Coeur d'Alene Mines Corporation (CDE), which returned –66.9%, also stayed in the index despite producing extremely poor returns during the period.[12]

Commoditization of the S&P 500 – Another Source of Disparity

While statistical evidence points to a reverse survivorship bias as the major cause of the Russell 2000 Index's poor performance versus the S&P 500 Index when compared to active managers, we believe there is another factor assisting the exceptional performance of the S&P 500 Index – its commoditization.

The S&P 500 Index has become a proxy for the broad, U.S. equity market through exceptionally liquid futures contracts. More than 31 million contracts for the index were bought or sold in 1998 on the Chicago Mercantile Exchange.[13] Money managers awarded large mandates often will buy S&P 500 futures contracts to give the account equity exposure while positions are gradually taken. The market makers for these futures contracts often hedge their position by trading all of the underlying securities in the index.

There is also an extremely liquid market for options on the futures contracts themselves. Consequently, the S&P 500 has been commoditized. It is now traded as a single security, benefiting all stocks in the index regardless of their underlying strength. Many investors indirectly invest in all of the companies within the index, regardless of their individual merits. This buying of the index as a whole decreases the disparity of the relative performance of companies within the index. And the smaller the disparity in relative performance within an index, the more difficult it is for an active manager to consistently outperform the benchmark.

Small or poor-performing stocks in the Russell 2000 don't benefit from a similar phenomenon. While the index does have a futures contract, only 276,662 futures contracts on the index were bought or sold in 1998 – less than 1% of the volume for S&P 500 futures contracts.[14]

Small Cap Managers Are Not Better Than Large Cap Managers

Returning to our original question, it is clear that small cap active managers are not necessarily more capable than their large cap counterparts. The index they are compared with, the Russell 2000, is plagued by a reverse survivorship bias and a lack of liquidity that doesn't affect the S&P 500.

Exhibit E

Small and Large Cap Managers Virtually Equal Without Reverse Survivorship Bias [15]
June 1993 to June 1998

	% Managers Beating Benchmark		
Benchmark	**1 Year Period**	**3 Year Period**	**5 Year Period**
Russell 2000 +Bias	29.3%	40.3%	19.0%
S&P 500 Index	31.1%	18.6%	15.1%
Difference	-1.8%	21.7%	3.9%

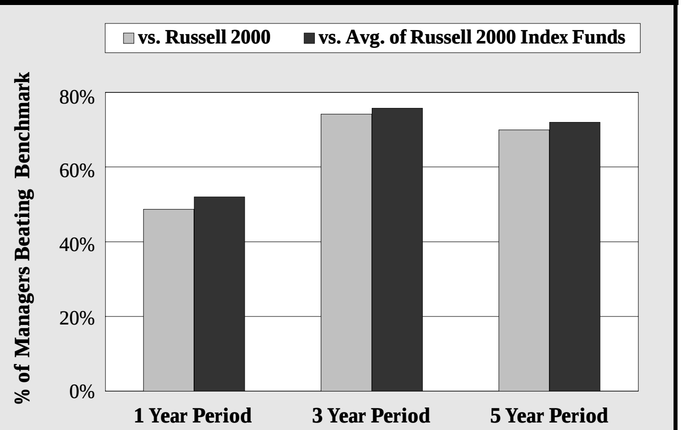
Another way of demonstrating that small cap managers are not necessarily better than their large cap brethren would be to compare how small cap managers would have fared if they were measured against a portfolio consisting of stocks kicked out of the Russell 2000 over the past five years. As seen in Exhibit E, only 19% of small cap managers on average would have matched or beat this portfolio net of fund expenses during the five-year time period that ended June 30, 1998 – a result that is just slightly higher than the 15.1% of large cap managers that beat the S&P 500.

Tracking Error – A Drawback to Indexing

Our study also begins with an assumption about passive investing that is not necessarily true – that index funds deliver returns equal to their benchmarks. In reality, most index funds underperform their benchmarks. And when comparing the returns of index funds, which are what passive investors actually invest in, to the returns of actively managed funds, indexing appears even less attractive.

Exhibit F

Tracking Error Reduces Returns of Index Funds [16]
June 1993 to June 1998



"Tracking error" refers to the difference between the return of an index fund and its benchmark. A major source of tracking error occurs when, as a fund invests new money or sells holdings to meet redemptions, it can raise or lower the price of index stocks. Commissions and fund expenses also add to tracking error, making it very difficult for an index fund to equal the performance of its benchmark on a net basis.

This problem of tracking error can be much greater in small cap index funds than large cap indexing because of the limited liquidity of small cap stocks. Stocks in the S&P 500 have significantly higher trading volumes than stocks in the Russell 2000. For example, the smallest stock in the S&P 500 as of June 30, 1998 was Armco Incorporated (AS). Its average daily trading volume was approximately 322,000 shares, which is more than five times greater than the average trading volume of Samsonite Corporation (SAMC), the smallest stock in the Russell 2000.[17] Another example of the limited liquidity of stocks in the Russell 2000 is that the average daily trading volume of Armco was nearly 33% greater than that of the biggest stock in the Russell 2000, Premier Parks Incorporated (PKS). Premier Parks Incorporated had a market capitalization nearly **four times greater** than Armco as of June 30, 1998.[18]

Adding to the tracking error is the fact that a mutual fund has operating expenses that are not reflected in a benchmark and reduce the return achieved by shareholders. Their expenses include management fees, accounting and transfer agent costs, and legal fees.

Through a combination of large size, low management fees and the use of futures contracts, many of the larger index funds have been able to limit the size of their tracking error. For the four index funds with five-year track records that use the Russell 2000 as a benchmark, however, the annualized tracking error was 44 basis points.[19] By incorporating this tracking error into our analysis, small cap indexing appears even less attractive as an alternative to active management.

While 70% of active managers beat the Russell 2000 from June 1993 to June 1998, 72% of active managers beat the average index fund that mimics the Russell 2000.

Conclusion – Indexing Alone is Not a Panacea

A large portion of the investing public has fallen in love with indexing. Investors have flocked to index funds because of their recent performance, low expense ratios and simple strategies. For some members of the media and financial advisors, indexing has taken on almost a cult status. But our findings point to a more ominous side of indexing, in particular small cap indexing.

The small cap market is very different from large caps. By their very definition, small cap stocks are not yet the most successful companies. The best-run small companies will eventually become large ones and depart the small cap stock index. In addition, unlike larger companies, there are far fewer analysts per small cap company providing regular information and analysis on each company. Smart active managers are able to regularly take advantage of this informational inefficiency.

Further, the limited liquidity of small company stocks makes it much harder for a passive manager to perfectly match an index. The resulting tracking error makes it much more likely that a small cap index fund will deliver a return substantially below that of its benchmark. As a result of these and other factors, small cap indexing (at least when using the Russell 2000 as a benchmark) has been a surefire means of achieving relatively poor investment returns.

Indexing clearly has a useful role in many investment strategies and its popularity will continue to grow with investors. However, our findings show that it would be naive to assume it is the best investment alternative for all asset classes.

Footnotes

[1] Data Source: New York Times and AMG Data Services
[2] Data Source: New York Times and AMG Data Services
[3] Data Source: RogersCasey Investworks
[4] Data Source: RogersCasey Investworks
[5] Data Source: RogersCasey Investworks
[6] Data Source: Bloomberg
[7] Data Source: Standard & Poors
[8] Data Source: Frank Russell Company
[9] Data Source: Bloomberg and Datastream
[10] Data Source: Bloomberg and Datastream
[11] Data Source: Bloomberg and Datastream
[12] Data Source: Bloomberg and Datastream
[13] Data Source: Chicago Mercantile Exchange
[14] Data Source: Chicago Mercantile Exchange
[15] Data Source: RogersCasey Investworks
[16] Data Source: Bloomberg
[17] Data Source: Bloomberg
[18] Data Source: Bloomberg
[19] Data Source: Morningstar Principia Pro

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Undiscovered Managers, LLC
700 North Pearl, Suite 1700, LB342
Dallas, TX 75201
Phone (888) 242-3514 • Fax (214) 999-7201

www.undiscoveredmanagers.com