The Not So Perfect Index

The Impact Of Russell 2000 Rebalancing On Small-Cap Performance

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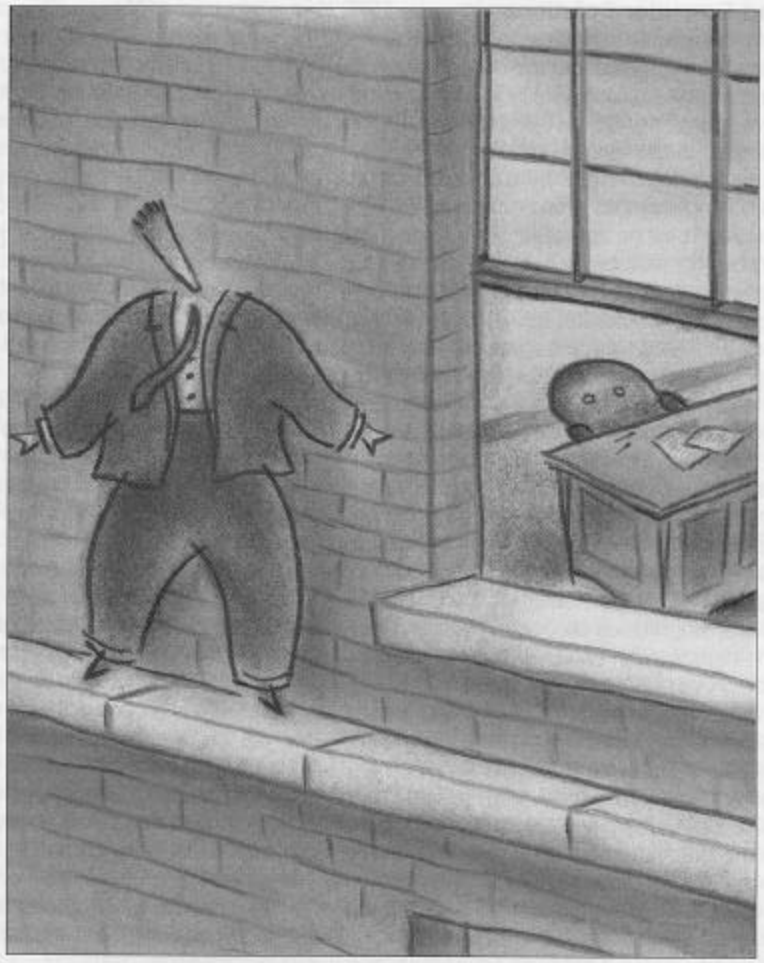

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The Russell 2000 Index has long been the benchmark of choice for small-cap investors. However, the rebalancing procedure used to maintain the index's emphasis on small-cap stocks is seriously flawed. The focus of all rebalancing activity on a single day creates substantial performance distortions around the June 30 rebalancing date each year. We show that the speculative trading activity that surrounds rebalancing depresses the return of the Russell 2000 Index by an average of approximately 2% per year. We also explore the implications of this result for the widely-held belief that active management is more likely to be successful with small-cap stocks than with large-cap stocks. After adjusting for the mechanical drag of the Russell's rebalancing, we find that the probability that a small-cap core or value manager will outperform is not appreciably different from the probability of outperformance for large-cap managers in the same styles.

Some of the appeal of Russell 2000 likely results from its straightforward construction. Each May 31, the Frank Russell Company ranks all U.S.-domiciled companies by their market capitalization, identifying those with rankings 1,001 through 3,000 as small. These stocks become the constituents of the Russell 2000 Index one month later. The problem with this procedure is that literally hundreds of index changes can be identified several months prior to the June 30 rebalancing. Speculators sell the stocks that are likely to leave the index, depressing their prices and the return of the index in the months prior to rebalancing. Speculators also purchase shares of firms likely to be added to the index, anticipating an increase in demand as rebalancing approaches. As a result, stocks often join the index at artificially high prices, creating a drag on index performance as their prices return to more normal levels in the months following rebalancing.

Rebalancing drag may be one factor contributing to the growing popularity of alternative small-cap benchmarks like the S&P (Standard & Poor's) 600 Index. Using tracking error as a means to identify the benchmarks of indexers and enhanced indexers, one can see that the S&P 600 has gained rapid acceptance since its launch in 1994. Thirteen products included in the early release of the Q4 2001 Plan Sponsor Network (PSN) database had an annualized tracking error of 5% or less relative to the S&P 600 Index over the last five years. These products had total assets of approximately $10.4 billion. These figures compare favorably to those for Russell 2000 benchmarked products. Ten products had tracking error of 5% or less relative to the Russell 2000 over the same period. Assets invested in these products totaled approximately $14 billion. Interestingly, there were three products meeting both tracking error criteria. All three had lower tracking error relative to the S&P 600 Index. The popularity of the S&P 600 as an alternative to the Russell 2000 has also been confirmed by direct canvassing of index and enhanced index providers. The results of a survey published on page 32 of the March 18, 2002 issue of Pensions & Investments indicated that 8% of all index and enhanced index managers responding to the survey offered products benchmarked to the S&P 600 while only 4% offered products benchmarked to the Russell 2000.

The Impact Of Rebalancing On Russell 2000 Index Performance

To gauge the impact of rebalancing on index performance, we compared average quarterly and monthly returns of the Russell 2000 Index and the S&P 600 Index from January 1994 through December 2001. The S&P 600 Index is a representative sample of 600 stocks with capitalizations similar to those included in the Russell 2000 Index. All other things being equal, the two indexes would be expected to provide similar long-run returns. However, a key difference between the two indexes is the manner in which their respective providers rebalance them. The stocks to be added and deleted from the S&P 600 are determined by the Standard & Poor's Index Committee, using a combination of quantitative and qualitative criteria. Changes to the S&P 600 Index are normally implemented with five or fewer days notice to the financial community. Both the secretive nature of the selection process and the short notice prior to any changes in the index limit the amount of speculative activity surrounding changes in the S&P 600 index. Therefore a comparison of the returns of the two indexes should shed some

Table 1

Average Quarterly Excess Return
(S&P 600 - Russell 2000)
1/1994 – 12/2001

Quarter	Average	Minimum	Maximum	St. Dev.	T-Signif.
1st	-0.77	-3.57	1.01	1.60	85.8%
2nd	0.78	-0.58	4.79	1.78	83.7%
3rd	1.80	-0.77	3.88	1.47	98.8%
4th	0.19	-5.99	8.16	3.92	54.5%

Table 2

Average Monthly Excess Return
(S&P 600 - Russell 2000)
1/1994 – 12/2001

Month	Average	Minimum	Maximum	St. Dev.	T-Signif.
January	-0.79	-2.59	0.33	0.91	96.1%
February	-0.16	-3.12	1.71	1.40	60.9%
March	0.09	-1.91	2.89	1.34	56.2%
April	0.51	-2.35	4.30	1.85	73.6%
May	0.33	-.085	2.87	1.19	73.7%
June	-0.13	-2.81	1.17	1.16	60.6%
July	1.47	-0.40	3.74	1.24	98.7%
August	0.44	-0.70	1.24	0.67	91.9%
September	-0.10	-1.70	0.77	0.79	61.3%
October	0.54	-0.66	5.03	1.92	74.3%
November	-0.12	-1.79	1.07	0.82	63.9%
December	-0.12	-3.10	3.73	1.96	55.9%

light on the performance drag associated with the speculative activity surrounding the Russell 2000 rebalancing. The length of the study period is limited by the date that the S&P 600 Index was introduced to the market. A substantial simulated return history exists prior to the S&P 600's 1994 introduction. These results have been excluded from the study because of the general difficulty in back-testing a selection process with substantial qualitative components in an unbiased manner.

Table 1 examines the excess return of the S&P 600 Index relative to the Russell 2000 Index by calendar quarter. The values reported in each row represent the average excess return for a particular quarter across the eight years included in the sample, the smallest and largest excess returns across the eight observations, and the standard deviation of the eight observations. Each row also includes the probability level at which the observed average excess return for that quarter is statistically significant. At a probability level of 90% or higher, it is common to reject the hypothesis that return differences are random. In three of the four quarters, the average excess return of the S&P 600 Index is positive, including the second and third quarters, in which rebalancing effects are believed to depress the return of the Russell 2000 Index. The second quarter excess return may result from speculative selling depressing the prices of shares likely to leave the index. The excess return in the third quarter may result from recent additions to the index that were bid-up by pre-addition speculation returning to more normal prices. Though both effects appear to operate, only the 1.80% average excess return in the third quarter is statistically significant at the 90% probability level.

Table 2 examines the excess return of the S&P 600 Index relative to the Russell 2000 Index by calendar month. In this case, three of the 12 months have excess returns that are statistically significant at the 90% level, with two of the three apparently linked to rebalancing: July and August. Post-rebalancing effects once again dominate, with the S&P 600 enjoying an average excess return of 1.47% during July and 0.44% during August. The significant excess return in January may reflect subtle differences in the composition of the two indexes. For example, the median market cap of the

S&P 600 is approximately 20% higher than that of the Russell 2000. The Russell 2000's strong performance in January may be the combination of a slightly higher concentration in micro-cap stocks and the typically strong performance of small-cap stocks during January.

Based on these results it appears reasonable to conclude that the annual rebalancing of the Russell 2000 depressed the returns of that index by at least 1.8% per year during the 1994 to 2001 period, accounting for much of the 2.29% average annual return advantage enjoyed by the S&P 600 Index over the Russell 2000 Index.

Implications For The Effectiveness Of Small-Cap Active Management

It is generally believed that active managers of small-cap stocks enjoy a higher probability of outperforming their benchmark than active managers of large-cap stocks. Over long-term periods, the data have consistently shown the majority of large-cap funds underperforming their benchmarks, while the majority of small-cap funds have outperformed their benchmarks. This conclusion is of course sensitive to the benchmarks used to gauge manager performance. As we have shown, the returns of the commonly used Russell 2000 small-cap benchmark suffer a substantial downward bias due to its highly-predictable rebalancing procedure. Correcting for this downward bias would certainly "raise the bar" for small-cap managers and perhaps bring into doubt the assertion that active management is better suited to small-cap stocks than large-cap stocks. To examine this possibility, we used returns-based analysis to identify 334 small-cap and 480 large-cap manager return series among the 1526 manager return series with 5 years of data reported through 12/31/01 in the early release of the PSN database for the fourth quarter of 2001. An aggressive screening process was used to ensure that mid-cap managers were excluded from both samples, hence the small size of both groups relative to the manager universe. Additional returns-based analysis was used to segregate the small-cap and large-cap samples into managers employing value, growth and blended styles of management.

Table 3 reports results for comparisons of small-cap manager returns to the returns of both Russell 2000 and S&P 600 based benchmarks. The Russell-based benchmarks used were the Russell 2000 Value for value managers, the Russell 2000 for blend managers, and the Russell 2000 Growth for growth managers. The S&P-based benchmarks used were the BARRA/S&P 600 Value for value managers, the S&P 600 for blend managers, and the BARRA/S&P 600 Growth for growth managers. The returns of the S&P 600- based benchmarks provide an approximate estimation of the rebalancing bias present in the Russell 2000 benchmark returns. Correcting for rebalancing bias results in a reduction of 12% to 24% in the number of managers outperforming their benchmark depending upon the style category. (Small-cap style benchmarks are of course available from other providers, notably Dow Jones and Wilshire. The returns of the value indexes of both providers are slightly lower than that of the Russell Value Index at 11.03% and 10.73%, respectively. The returns of their growth indexes are higher than that of the Russell Growth Index at 10.90% and 3.79%, respectively.)

The results for a similar analysis of large-cap managers are reported in Table 4. In this case, the Russell-based benchmarks used were the Russell 200 Value for value man-

Table 3

Small Cap Manager Performance
1/1997 – 12/2001

		Russell Benchmark			S&P Benchmark		
Style	**#**	**Return**	**# outperform**	**% outperform**	**Return**	**# outperform**	**% outperform**
Value	157	11.20%	111	70.7%	12.78%	92	58.6%
Blend	88	7.52%	77	87.5%	10.66%	56	63.6%
Growth	89	2.87%	83	93.3%	7.05%	69	77.5%

Table 4

Large Cap Manager Performance
1/1997 – 12/2001

		Russell Benchmark			S&P Benchmark		
Style	#	Return	# outperform	% outperform	Return	# outperform	% outperform
Value	88	11.21%	49	55.7%	9.49%	69	78.4%
Blend	254	10.50%	187	73.6%	10.70%	170	66.9%
Growth	138	8.59%	105	76.1%	11.10%	62	44.9%

agers, the Russell 200 for blend managers, and the Russell 200 Growth for growth managers. The S&P-based benchmarks used were the BARRA/S&P 500 Value for value managers, the S&P 500 for blend managers, and the BARRA/S&P 500 Growth for growth managers. The degree of manager success against the highest performing large-cap benchmark, Russell-based for value and S&P-based for blend and growth, is highlighted in red bold-face type. The results here are somewhat unusual in that the majority of large-cap managers were able to outperform their benchmarks across the period. The sustained weakness of the equity market allowed many managers to outperform simply by holding cash. Comparing these large-cap results to the similarly highlighted small-cap manager results in Table 3, one sees that value and blend managers in both samples enjoyed similar degrees of success during this 5-year time period. Small-cap value managers performed slightly better than their large-cap counterparts, with 58.6% out performing vs. 55.7% in the large-cap sample. Meanwhile large-cap blend managers had a slight advantage over their small-cap counterparts, with 66.9% out performing vs. the 63.6% degree of success for small-cap. When compared to the more efficient S&P 600 benchmark, it is clear that small-cap funds performed in line with their large-cap counterparts. Plan sponsors and consultants that are willing to hire small-cap active managers should not arbitrarily rule out the use of active managers in the large-cap space.

The only style category where small-cap active managers enjoy a large advantage is growth. In this category, 77.5% of the small-cap growth managers were able to outperform vs. only 44.9% of large-cap managers. The strong performance of small-cap growth managers echoes a broader trend in the small-cap market. It simply does not make sense to pay-up for growth in the small-cap environment where all firms offer the potential for strong growth simply by grabbing market share from larger competitors. This explains the strong performance of small-cap value vs. small-cap growth, with value having outperformed growth by an average of nearly 6% per year for the past 20 years (based on a comparison of either the returns of the Russell 2000 Value and Growth Indexes or the returns of the BARRA/S&P 600 Value and Growth Indexes).

Conclusions

The highly predictable nature of the Russell 2000 rebalancing appears to bias the returns of that index downward by an average of approximately 2% per year. After adjusting for this downward bias in the well known small-cap benchmark, much of the perceived performance advantage of small-cap active managers over their large-cap counterparts disappears. Over the five years ending December 31, 2001, small-cap and large-cap managers of value and blend style products enjoyed similar degrees of success in outperforming their respective benchmarks. The one area where small-cap managers enjoyed greater success than large-cap managers during this time period was in managing growth stocks. However, this may simply reflect the fact that it does not make sense to pay up for growth in the small-cap environment. A straightforward strategy of avoiding stocks with exceptionally high P/Es would have worked extremely well during the past five years and is also consistent with the performance of the broad small-cap market over the past 20 years.