

7. Limitations of Indexing

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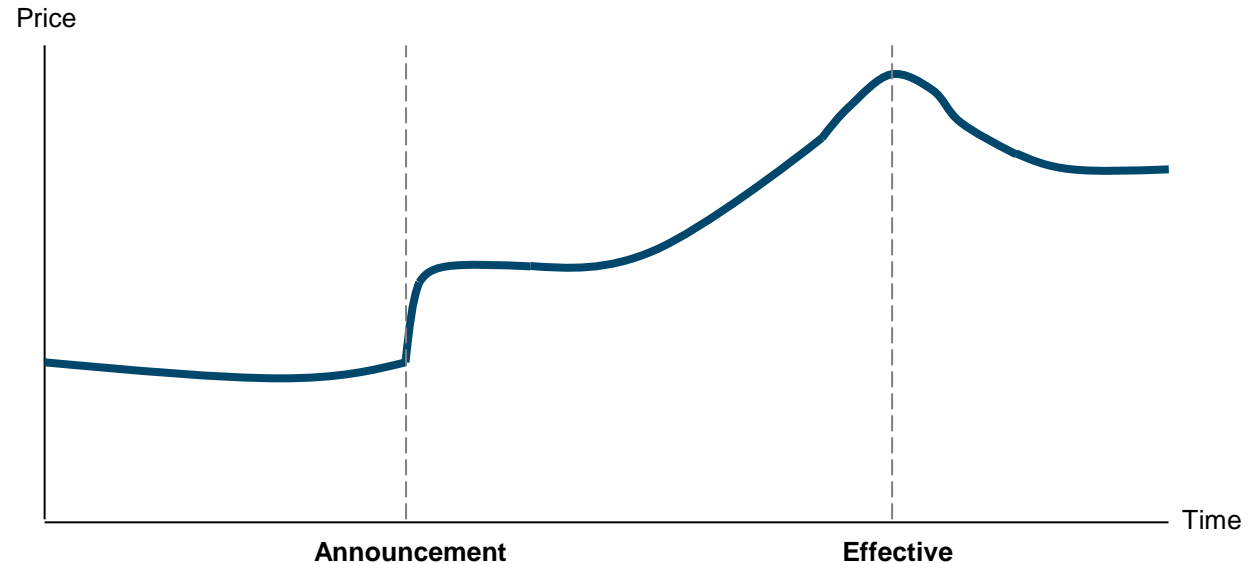
Tracking an Index Can Be Costly

- Tracking an index may result in significant trading costs.
- Index replication requires executing with pre-specified transactions, stocks, amounts, and trade dates.
- Timing lag between reconstitution announcement and effective date enables non-indexers to buy additions and sell deletions before tracking-sensitive investors, when prices are often more attractive.



The Effect of Index Reconstitution on Stock Prices

- Stocks rise on announcement of inclusion.
- Index funds are forced to buy high on effective date.
- Buying and selling to track index changes reduces tracking error but generates transaction costs.



	S&P 500 Index	MSCI EAFE Index
One-Day Return after Announcement (%)	3.2	3.4
Run-Up to Effective Date (%)	3.8	4.5
Decay after Effective Date (%)	-2.1	-2.6

S&P 500 data source: Anthony Lynch and Richard Mendenhall, "New Evidence on Stock Price Effects Associated with Changes in the S&P 500 Index," *Journal of Business* 70, no. 3 (July 1997): 351-83. MSCI EAFE Index data source: Rajesh Chakrabarti, Wei Huang, Narayanan Jayaraman, and Jinsoo Lee, "Price and Volume Effects of Changes in MSCI Indices: Nature and Causes," *Journal of Banking and Finance* 29, no. 5 (May 2005): 1237-64.

For illustrative purposes only. Past performance is not a guarantee of future results.



Percentage of Assets by Market Cap

Market Universe

As of December 31, 2009

Market Cap Percentile	S&P/Citigroup 500 Growth Index	S&P 500 Index	S&P/Citigroup 500 Value Index	Russell 1000 Index	Russell 1000 Value Index	Russell 3000 Index	Russell 3000 Value Index	CRSP 1-10 Index	Russell 2000 Index	Russell 2000 Value Index
100.0	30.6	30.1	29.6	26.8	25.7	24.7	23.6	25.9	0.0	0.0
75.0	33.7	31.5	29.2	27.9	26.9	25.7	24.7	24.5	0.0	0.0
50.0	15.6	17.5	19.4	15.8	16.5	14.6	15.2	14.7	0.0	0.0
35.0	5.3	5.7	6.0	5.3	4.7	4.9	4.3	4.8	0.0	0.0
30.0	6.4	5.6	4.9	5.6	5.9	5.2	5.4	4.8	0.0	0.0
25.0	5.1	5.2	5.3	5.7	6.3	5.3	5.8	4.9	0.6	0.0
20.0	2.7	3.1	3.6	5.6	5.2	5.2	4.8	5.0	0.3	0.5
15.0	0.3	0.7	1.1	2.6	3.1	2.5	2.9	2.5	1.2	0.7
12.5	0.2	0.4	0.6	2.6	2.9	2.6	2.8	2.5	2.9	1.3
10.0	0.2	0.2	0.3	1.5	1.9	2.1	2.3	2.1	8.5	7.1
8.0	0.0	0.1	0.1	0.6	0.8	3.1	3.5	3.2	32.6	33.7
5.0	0.0	0.0	0.0	0.0	0.1	0.9	1.0	1.0	11.2	12.0
4.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.6	17.4	17.4
2.5	0.0	0.0	0.0	0.0	0.0	2.0	2.2	2.6	25.4	27.4
Number of Companies	306	500	347	963	677	2,971	2,069	3,688	2,005	1,392
Estimated Universe (SBB)	5,011	9,928	4,917	11,043	5,448	11,980	5,930	12,663	937	482
Wtd. Avg. Mkt. Cap (\$MM)	86,812	82,014	77,124	73,652	69,275	67,972	63,727	68,879	1,025	950
Median Market Cap (\$MM)	9,667	9,046	8,652	4,209	3,931	754	736	438	401	366
Wtd. Avg. BtM	0.32	0.49	0.66	0.49	0.70	0.51	0.72	0.51	0.65	0.89
Median BtM	0.32	0.46	0.56	0.48	0.65	0.57	0.75	0.62	0.62	0.79

Area within box represents 90% or more of index value. The CRSP 1-10 Index measures the performance of the total US stock market, which it defines as the aggregate capitalization of all securities listed on the NYSE, AMEX, and Nasdaq exchanges.

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Percentage of Assets by Market Cap

Large Company Indexes

As of December 31, 2009

Market Cap Percentile	S&P/ Citigroup 500 Growth Index	S&P 500 Index	S&P/ Citigroup 500 Value Index	Russell 1000 Growth Index	Russell 1000 Index	Russell 1000 Value Index	Russell 3000 Index	Russell 3000 Value Index	CRSP 1-10 Index	CRSP 1-5 Index
100.0	30.6	30.1	29.6	27.8	26.8	25.7	24.7	23.6	25.9	28.3
75.0	33.7	31.5	29.2	29.0	27.9	26.9	25.7	24.7	24.5	26.8
50.0	15.6	17.5	19.4	15.1	15.8	16.5	14.6	15.2	14.7	16.1
35.0	5.3	5.7	6.0	5.0	5.3	4.7	4.9	4.3	4.8	5.2
30.0	6.4	5.6	4.9	5.4	5.6	5.9	5.2	5.4	4.8	5.3
25.0	5.1	5.2	5.3	5.1	5.7	6.3	5.3	5.8	4.9	5.4
20.0	2.7	3.1	3.6	6.0	5.6	5.2	5.2	4.8	5.0	5.4
15.0	0.3	0.7	1.1	2.0	2.6	3.1	2.5	2.9	2.5	2.7
12.5	0.2	0.4	0.6	2.2	2.6	2.9	2.6	2.8	2.5	2.7
10.0	0.2	0.2	0.3	1.1	1.5	1.9	2.1	2.3	2.1	1.8
8.0	0.0	0.1	0.1	0.5	0.6	0.8	3.1	3.5	3.2	0.3
5.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	1.0	1.0	0.0
4.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.6	0.0
2.5	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.2	2.6	0.0
Number of Companies	306	500	347	623	963	677	2,968	2,069	3,688	2,005
Estimated Universe (SBB)	5,011	9,928	4,917	5,594	11,043	5,448	11,980	5,930	12,663	937
Wtd. Avg. Mkt. Cap (\$MM)	86,812	82,014	77,124	77,914	73,652	69,275	67,972	63,727	68,879	1,025
Median Mkt. Cap (\$MM)	9,667	9,046	8,652	4,494	4,209	3,931	754	736	438	401
Wtd. Avg. BtM	0.32	0.49	0.66	0.29	0.49	0.70	0.51	0.72	0.51	0.65
Median BtM	0.32	0.46	0.56	0.37	0.48	0.65	0.57	0.75	0.62	0.62

Area within box represents 90% or more of index value. The CRSP 1-10 Index measures the performance of the total US stock market, which it defines as the aggregate capitalization of all securities listed on the NYSE, AMEX, and Nasdaq exchanges. The CRSP 1-5 Index measures the performance of US large cap stocks, those in the five largest deciles of the US market. Russell data copyright © Russell Investment Group 1995-2010, all rights reserved. The S&P data are provided by Standard & Poor's Index Services Group. CRSP data provided by the Center for Research in Security Prices, University of Chicago. Dow Jones Wilshire data provided by Dow Jones Indexes. Indexes are not available for direct investment. Index performance does not reflect the expenses associated with the management of an actual portfolio. Attributes and characteristics are as of date shown and are subject to change.



Percentage of Assets by Market Cap

Small Company Indexes

As of December 31, 2009

Market Cap Percentile	Russell 2000	Russell 2000 Value	S&P 600 Index	S&P 600 Value Index	CRSP 6-10 Index	CRSP 9-10 2000
100.0	0.0	0.0	0.0	0.0	0.0	0.0
75.0	0.0	0.0	0.0	0.0	0.0	0.0
50.0	0.0	0.0	0.0	0.0	0.0	0.0
35.0	0.0	0.0	0.0	0.0	0.0	0.0
30.0	0.0	0.0	0.0	0.0	0.0	0.0
25.0	0.6	0.0	0.0	0.0	0.0	0.0
20.0	0.3	0.5	0.0	0.0	0.5	0.1
15.0	1.2	0.7	0.0	0.0	0.0	0.0
12.5	2.9	1.3	3.4	1.0	0.7	0.0
10.0	8.5	7.1	7.4	4.4	5.5	0.8
8.0	32.6	33.7	37.1	35.8	33.2	0.5
5.0	11.2	12.0	13.4	13.8	11.7	0.5
4.0	17.4	17.4	20.4	20.8	18.1	4.5
2.5	25.4	27.4	18.4	24.2	30.3	93.5
Number of Companies	2,005	1,392	600	427	2,784	1,901
Estimated Universe (SBB)	937	482	402	199	1,093	295
Wtd. Avg. Mkt. Cap (\$MM)	1,025	950	1,026	922	883	298
Median Market Cap (\$MM)	401	366	608	540	235	116
Wtd. Avg. BtM	0.65	0.89	0.62	0.80	0.67	0.81
Median BtM	0.62	0.79	0.63	0.76	0.69	0.79

Area within box represents 90% or more of index value. The CRSP 6-10 Index measures the performance of US small cap stocks, those in the five smallest deciles of the US market. The CRSP 9-10 Index measures the performance of US micro cap stocks, those in the two smallest deciles of the US market.

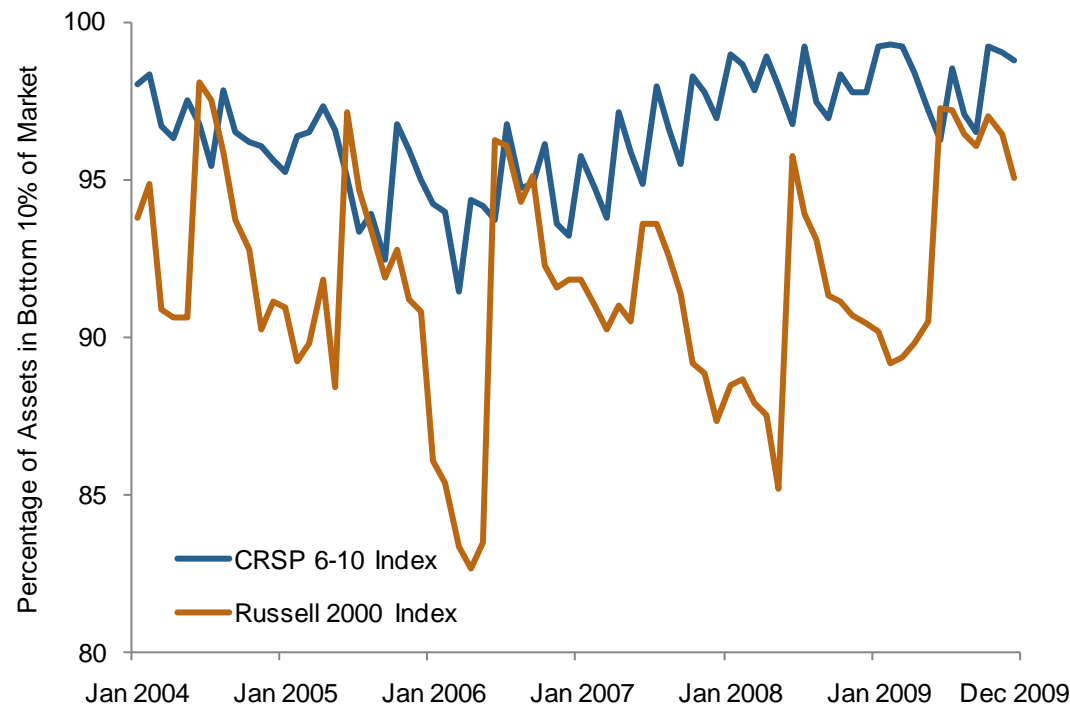
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Annual Index Reconstitution Effects

Consistency of Asset Class Exposure

Percentage of Assets in Bottom 10% of Market	Russell 2000 Index	CRSP 6-10 Index
June 30 Averages (reconstitution month)	96.44	95.58
May 31 Averages (11 months after reconstitution)	88.21	96.55



- Over time, securities within an index can migrate from one asset class to another (such as from small cap to large cap).
- An index's characteristics may be significantly different 11 months after reconstitution due to security migration.
- An index that purports to represent a certain asset class may not offer thorough, consistent exposure to the underlying risk factors.

MSCI Disclosure

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