MSCI

Research Insight

Small Caps – No Small Oversight

Institutional Investors and Global Small Cap Equities

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Executive Summary

Many investors recognize that their reference universe should encompass large, mid and small caps, and furthermore accept the investment belief that smaller companies should earn a risk premium over larger ones. Nevertheless, in practice, most of these investors underweight the small cap segment. Institutional investors—particularly in Europe and Asia—tend to have limited small cap representation, even within their own markets.

In this paper, we review various aspects of this puzzle and argue that omitting small caps is in fact a significant active decision which many investors may be making unintentionally. An investor with a neutral view on small caps should allocate a percentage weight to small caps that is equivalent to their weight in the full universe. Excluding small caps represents an "active" decision to ignore up to 14% of the universe and amounts to a negative view on the small cap premium. This decision would have forfeited 60 bps of annual performance over the last decade and could have consumed a substantial part of an asset owner's risk budget as well, in the range of 50% to 75%.

These numbers are considerable relative to other decisions where institutional investors can spend significant time. In contrast to the relatively straightforward asset allocation decision for small caps, resource-intensive manager selection decisions typically consume much of the institutional investor's time. Traditionally, these resources are spent selecting large and mid cap active managers with the hope of achieving, net of fees, some additional basis points from these alpha mandates. With median over-performance of large and mid cap managers having been 22 bps and 36 bps, respectively, for US and non-US portfolios over the last ten years based on eVestment data, the incremental payoff relative to the small cap allocation decision is not clear. More recently, institutional asset allocators have shown growing interest in diversification across strategy betas. For those currently underweight small caps, the natural first step may be to harvest the risk premium embedded in a plain vanilla small cap beta exposure. In our view, excluding small caps is no small oversight.

What are the main reasons institutional investors give for excluding global small caps in their equity universe? Some institutional investors believe they achieve sufficient small cap exposure through the opportunistic small cap investments made by their large and mid cap active managers. In these instances, however, the realized exposure to small cap stocks tends to be marginal. And in cases where the small cap allocation is not marginal, a significant problem of benchmark mismatch occurs. Here the risk budget, which should be allocated to find alpha, is not only inefficiently allocated, but managers are rewarded for taking on beta exposure when they should in fact only be rewarded for alpha.

A second common reason cited for omitting small caps in the institutional portfolio is that small cap investing is more complicated, costly, and resource-intensive. For institutions seeking small cap products, a twin problem exists in that there are fewer managers specializing in small caps, and these tend to be from small niche asset management firms. Here, we argue that if there are not sufficient resources to find skilled small cap active managers, institutional investors should implement passive allocations to small caps rather than forgoing their beta return altogether. In recent years we have seen an expansion of passive small cap products; and institutions willing to run these allocations internally may find liquidity and costs to be far less of a concern than assumed.

The paper is structured as follows. In Section 1, we look at the performance of small cap equities historically and provide an overview of the well-known small cap premium. Section 2 discusses important differences between large/mid caps and small caps around the world and why institutions who are not fully participating in global small caps are effectively making a significant active decision. Section 3 considers small cap accessibility issues including liquidity and trading costs. Finally, in Section 4, we summarize the current product landscape for small cap investors.

Section I: Global Small Caps in the Institutional Portfolio

The Small Cap Premium around the World

The performance of small caps has been widely studied by academics and practitioners since the 1980s.[1] The research in this area is often referred to as the "small cap premium, "size premium", or the "size anomaly" literature. This premium has been found to exist even after influences are controlled for: market beta, the value effect, the momentum effect, liquidity effects, leverage, and so forth.[2] Moreover, the phenomenon has been identified across the world in both developed and emerging markets (Rizova, 2006).

Why does the small cap premium exist? The question is one of ongoing debate but various reasons have been proposed. Fama and French (1993) originally hypothesized that small caps have higher systematic risk which earns them a higher return premium. Subsequent researchers suggested that size may proxy for other unobservable and underlying risk factors associated with smaller firms such as liquidity (Liu (2006) and Amihud (2002)), information uncertainty (Zhang (2006)), financial distress (Chan and Chen (1991) and Dichev (1998)), or default risk (Vassalou and Xing (2004)). Another line of reasoning is that small caps are mispriced by investors due to behavioral biases (Lakonishok, Shleifer, and Vishny (1994)).

While significant and positive over the long run, the small cap premium is cyclical, however, and its exact size varies from market to market[3] and over different time periods. Fama and French (1993) originally observed a premium of 0.27% per month in the US over the period 1963 to 1991. But in the subsequent decade, particularly in the second half of the 1990s, small caps underperformed large caps, leading many market observers to prematurely declare the death of the small cap premium. Over the last decade, however, global small cap performance has been relatively strong again. Exhibit 1 shows the annualized average returns to MSCI Standard Indices (large and mid caps) relative to MSCI Small Cap Indices for various geographic breakdowns.[4]

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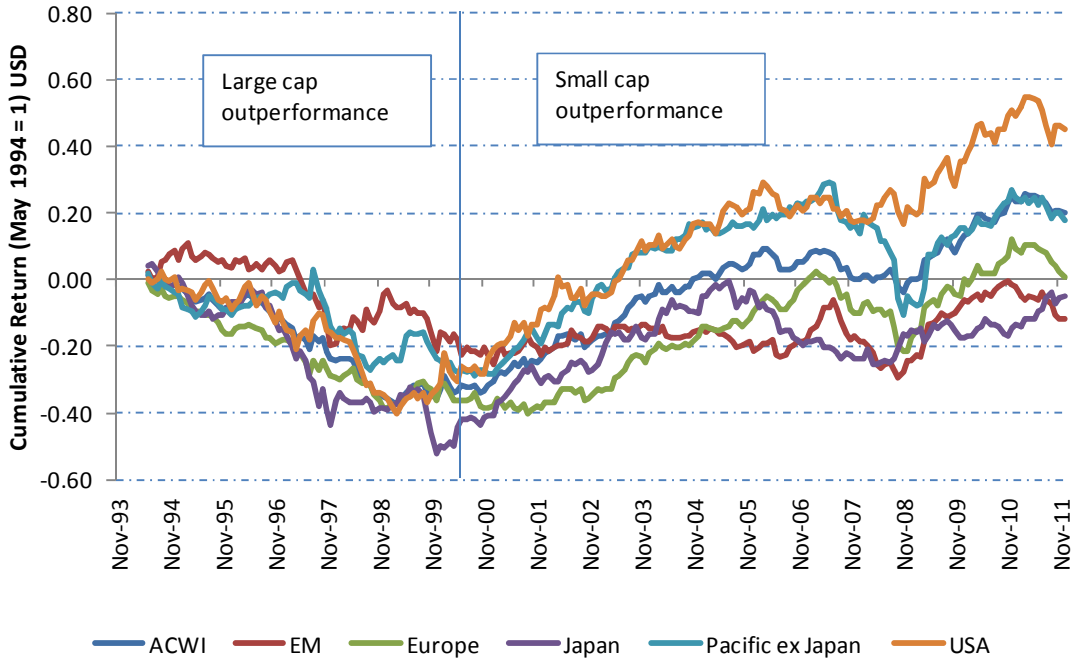
[1] The size anomaly research using US data has a rich history starting with Banz (1981).

[2] The original Fama-French (1993) paper found the size effect after accounting for a market factor and value factor. Jegadeesh and Titman (1993) and Carhart (1997) control for stock price momentum. Pastor and Stambaugh (2003) and Ibbotson and Hu (2011) control for liquidity. Menchero, Morozov, and Shepard (2008) control for industry factors and additional factors such as those capturing firms with high leverage or low liquidity.

[3] Rizova (2006) documents developed market small cap premiums in the literature ranging from -8.9% for Portugal (Rouwenhorst, 1999) to 9.0% for Spain (Heston et al., 1999) over various time periods.

[4] Throughout the presentation, the universes for large, mid, and small caps reflect the definitions in the MSCI Global Investable Index methodology. Global small caps for instance represent approximately the lowest 14% of the global investable equity universe by market capitalization. The methodology targets both coverage and size integrity when defining size segments across countries of varying absolute size in a way that is modular and consistent. Prior to June 2008, simulated history is used for index returns.

Exhibit 1: Small Caps Outperformed during the "Lost Decade" after Lackluster Returns in the 1990s (Cumulative USD Gross Returns of MSCI Small Cap Indices Relative to MSCI Standard Indices in Each Region, June 1994 to December 2011)



Source: MSCI

Return and Risk Implications of Excluding Small Caps from the Strategic Allocation

What are the implications of an institutional small cap allocation in the context of the total equity allocation. As previously noted, the premium to small caps experienced long cycles of strong performance in the 1980s and 2000s but not in the 1990s. Looking at just the past decade (since January 2002), the premium has been substantial—a 4.5 annual percentage point difference between the performance of the ACWI Small Cap Index and the ACWI Standard Index (large/mid caps) which returned 9.3% and 4.8% respectively (see Exhibit 2). In the context of an institution's total equity allocation the relevant comparison is between the return of a portfolio with small caps and the other without small caps, i.e., the return of the ACWI IMI (large, mid, and small caps) versus the return of the ACWI Standard Index. As seen in Exhibit 2, the MSCI ACWI IMI Index had annualized returns of 5.4%, compared to 4.8% for the MSCI ACWI Index over the last ten years, a difference of 60 basis points annually. By region, the small cap premium has been the strongest in the Pacific ex Japan region and the weakest in Emerging Markets. We note that variation in relative small cap performance from year to year can be quite large; in other words, timing risk can be important.

Exhibit 2: USD Gross Total Returns by Year, May 1994 to December 2011

Year	ACWI IMI*	ACWI Standard Index	ACWI Small Cap Index	ACWI IMI* Minus ACWI Standard Index	IMI* Minus Standard Returns				
					USA	Europe	Japan	Pacific ex Japan	Emerging Markets
1995	17.4%	18.6%	10.5%	-1.0%	-1.0%	-1.6%	-1.1%	-0.8%	-0.6%
1996	11.6%	12.1%	8.0%	-0.5%	-0.5%	-0.4%	-0.9%	0.7%	-0.2%
1997	11.2%	13.2%	-1.4%	-1.8%	-0.9%	-1.5%	-4.4%	-1.6%	-3.2%
1998	18.0%	20.1%	2.3%	-1.8%	-2.6%	-1.5%	0.8%	-2.0%	2.5%
1999	31.0%	31.1%	29.8%	-0.1%	0.2%	0.3%	-2.6%	0.1%	-3.1%
2000	-15.2%	-15.8%	-10.1%	0.8%	1.4%	-0.3%	2.2%	-1.0%	-0.3%
2001	-15.4%	-16.5%	-6.4%	1.3%	1.8%	-0.1%	2.0%	2.2%	0.0%
2002	-17.3%	-18.0%	-11.5%	0.9%	0.5%	0.6%	0.9%	3.1%	1.2%
2003	36.2%	33.6%	51.3%	2.0%	2.0%	1.9%	2.0%	2.7%	1.0%
2004	16.9%	15.6%	24.2%	1.2%	1.2%	1.4%	1.8%	1.5%	-0.4%
2005	12.1%	11.4%	15.9%	0.7%	0.5%	0.8%	1.4%	0.0%	-0.9%
2006	21.5%	21.5%	21.4%	0.0%	0.0%	1.5%	-3.2%	1.0%	0.0%
2007	11.7%	12.2%	7.2%	-0.5%	-0.3%	-0.9%	-0.8%	-0.4%	0.7%
2008	-42.0%	-41.8%	-43.4%	-0.2%	0.5%	-1.1%	1.2%	-2.4%	-1.0%
2009	37.2%	35.4%	51.3%	1.4%	1.4%	1.7%	-0.2%	2.3%	2.4%
2010	14.9%	13.2%	26.7%	1.5%	1.6%	1.7%	0.5%	1.3%	0.9%
2011	-7.4%	-6.9%	-11.0%	-0.5%	-0.6%	-1.1%	1.6%	-1.1%	-1.3%
June 1994 to December 2011	5.9%	5.8%	6.7%	0.2%	0.3%	0.0%	0.0%	0.3%	-0.1%
Period 1: Jun. 1994-Dec. 2001	6.6%	7.1%	3.5%	-0.5%	-0.2%	-0.8%	-0.7%	-0.4%	-0.6%
Period 2: Jan. 2002-Dec. 2011	5.4%	4.8%	9.3%	0.6%	0.7%	0.6%	0.5%	0.8%	0.3%

Source: MSCI. Geometric average for gross indices shown. Simulated indices based on GIMI methodology used prior to June 2008. The MSCI ACWI Index includes both developed (MSCI World Index) and emerging markets (MSCI Emerging Markets). Note that the regions (Europe, Japan, Pacific ex Japan, and USA) cover the World Index universe with the exception of Canada.
* IMI is the Investable Market Index consisting of Large, Mid, and Small caps.

The question that immediately follows is whether the incremental gain of 60 bps is significant. There are several reference points that come to mind. Consider first the incremental gains from selecting skilled managers. Whilst manager selection is not an asset allocation decision in the way the small cap allocation is, substantial resources are often devoted to selecting large cap active managers with the hope of getting, net of fees, additional basis points from these alpha mandates. Exhibit 3 shows the 5-year and 10-year excess returns of US and non-US active large/mid cap managers net of fees as of September 2011. The median excess returns for these US and non-US large/mid cap managers have been 22 bps and 36 bps, respectively.[5]

[5] Moreover, the active management portion represents only a fraction of the entire equity portfolio which can also include passive investments.

Exhibit 3: The Performance of Large and Mid Cap Managers (Managers Reporting to eVestment as of September 2011)

	US Large/Mid Cap Managers	Non-US Large/Mid Cap Managers
5-Year Excess Return Net of Fees		
Median of the Universe (%)	0.15	0.39
10-Year Excess Return Net of Fees		
Median of the Universe (%)	0.22	0.36

Reported excess returns and tracking error net of fees are shown.

A second reference point to consider is the time institutions may devote to allocating value or growth tilts through the selection of these types of managers.[6] The median excess return for value managers reporting to eVestment was 58 bps over the last decade.[7] This should be added to the return on the benchmark for the manager. For an approximate benchmark return, over the same period, the MSCI ACWI Value Index underperformed MSCI ACWI by 20 bps annually.

Even in a cap-weighted portfolio where small caps by definition get the least weight, the performance implications of adding small caps (60 bps over the last decade) have been significant compared to other allocation decisions.

What is the incremental volatility of investing in small caps? Exhibit 4 compares the volatility of small caps to large/mid caps. The incremental effect on risk of adding small caps is surprisingly small, and in some regions they can even reduce risk (e.g., Japan). Annualized volatility for MSCI ACWI over the past decade was 17.4%. MSCI ACWI IMI (with small caps added) over the same period showed only a marginal increase with annualized volatility of 17.6%, reflecting the diversification benefits of small caps.[8] Correlations, shown in Appendix 1, are generally lower between small cap segments.

Exhibit 4: Risk Summary (Annualized Standard Deviation, January 2002 to December 2011)

	IMI	Large/Mid Cap (Standard)	Small Cap
MSCI ACWI	17.6%	17.4%	19.8%
MSCI USA	16.4%	15.9%	20.3%
MSCI Europe	21.0%	20.8%	23.8%
MSCI Japan	16.9%	17.1%	17.3%
MSCI Pacific ex-Japan	22.1%	21.7%	26.3%
MSCI Emerging Markets	24.5%	24.4%	26.1%

Geometric annual average and annualized volatility of gross index returns shown. Source: MSCI

[6] Style-biased manager selection has historically had both an allocation component and a selection component. Again, we use this as a reference point as it is a decision which has typically consumed a fair amount of resources.

[7] These managers include US, EAFE, ACWI ex US, and Global managers, a total of 672 managers. Excess returns are assessed relative to their reported value benchmark.

[8] Note that the higher volatility of small caps has been more than offset by higher returns. For instance, the MSCI ACWI Small Cap Index had a return-to-risk ratio of 0.38 over the last decade compared to one of 0.32 for MSCI ACWI.

Overall volatility is important but equally important are the implications of excluding small caps for the risk budget. Risk budgeting is also very often expressed in terms of a maximum tracking error relative to the fund's benchmark. The tracking error of the equity portfolio with small caps relative to the one without small caps reflects the relative risk that an investor incurs by not investing in small caps. Tracking errors for the IMI indices relative to their large/mid cap counterparts are shown in Exhibit 5. The tracking error of MSCI ACWI IMI relative to MSCI ACWI has been 75 bps annually over the last decade, a relatively large amount when one considers the size of an average investor's risk budget. Large institutional investors, for example, typically take on 1.0-1.5% tracking error for their entire equity portfolio. It follows that the exclusion of small caps from the equity portfolio represents between one-half to three-quarters of the active risk budget. In Asia and the US, it may represent even more, given the higher tracking error in these regions.

Exhibit 5: Tracking Error of MSCI IMI Indices Relative to the MSCI Large/Mid Cap Indices (Annualized Tracking Error Based on Monthly Returns, June 1994 to December 2011)

	June 1994 to December 2011	January 2002 to December 2011
ACWI	0.82%	0.75%
USA	1.19%	1.09%
Europe	0.90%	0.85%
Japan	1.45%	1.34%
Pacific ex Japan	1.32%	1.23%
Emerging Markets	1.30%	1.06%

Source: MSCI

More recently, there has been growing interest within institutional asset allocators towards diversification across strategy betas. As we have seen in this section, the exclusion of small caps has had non-negligible effects on return and risk. The natural first step in harvesting risk premia, at least for those currently underweight small caps, may be just to add a plain vanilla small cap beta exposure. It may be somewhat premature to see more complex allocation decisions take precedence.

Section II: What Makes Small Caps Different?

In Section I, we discussed the premium to small caps and the implications for institutional investors. A question that often follows is what drives the performance of small caps and whether it is attributable to other well-known stock characteristics. A wealth of past studies have isolated the small cap premium from other effects such as beta, value (as reflected in book-to-price and earnings-to-price differences), momentum, and other fundamental or technical characteristics. This is in fact what many of the most well-known papers on the small cap premium aimed to do. Our efforts to attribute small cap performance to other factors also confirms that this small cap premium is one that can't be explained by other (at least well-known) traits. Appendix 2 describes additional detail on this issue.

In this section, we look at some of the characteristics that make small caps different from large and mid caps. We contrast small caps and large/mid caps along the following dimensions:

- Sector tilts
- Foreign exposure
- Strategic stakeholder profile
- Growth and valuation

Some of these are well-studied traits that impact stock returns such as sector profile, growth and valuation; other dimensions presented here such as foreign exposure and strategic stakeholder profiles are not as well-studied.

(1) **Sector Tilts:** Small-caps represent very different industries and companies. Generally industries that have large economies of scale will be under-represented in small caps (e.g. Consumer Staples, Energy, and Telecommunication Services) as reflected in the sector weights of the indices shown in Exhibit 6. Moreover, within sectors, there are important industry level differences. Within Health Care, for instance, pharmaceutical companies are tilted towards large caps while biotech companies are tilted towards small caps.[9] Within Financials, banks are tilted towards large caps while real estate firms are tilted towards small caps. Small caps also tend to be overweight cyclical sectors (Consumer Discretionary, Industrials, Materials) and underweight defensives (Health Care, Telecommunication Services, Consumer Staples).[10] These tilts can have significant return implications during different phases of the business cycle.

Sector biases can also vary substantially across regions. For instance, in Europe, there is much less difference in the exposure to banks and financial services between large/mid and small caps, especially relative to the US. Small caps in Europe have historically represented a very different part of the economy focusing on export-centric consumer and capital goods. This is in contrast with the heavy reliance of small caps in the US which has historically been concentrated in Financials and Information Technology.

Exhibit 6: Sector Weights of Small Caps (November 30, 2011)

A. Sector Weights

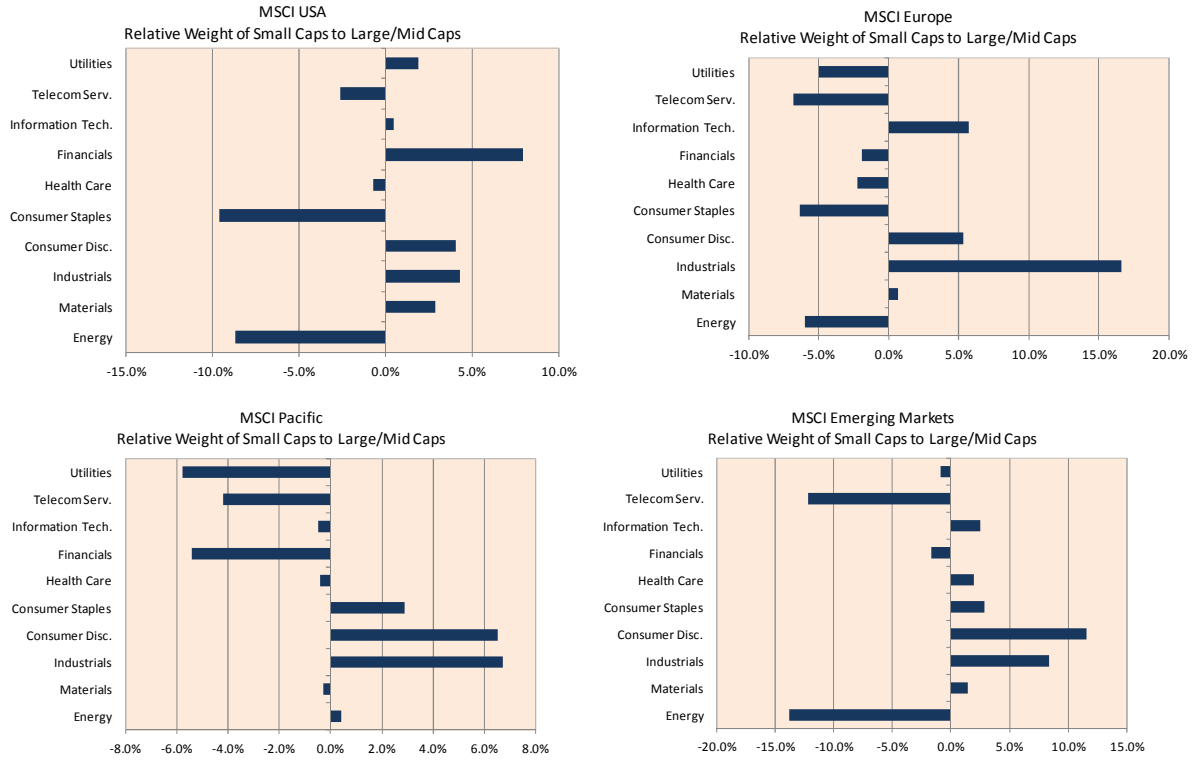
	MSCI USA		MSCI Europe		MSCI Pacific		MSCI Emerging Mkts	
	Large/Mid	**Small**	**Large/Mid**	**Small**	**Large/Mid**	**Small**	**Large/Mid**	**Small**
Energy	14.4%	5.7%	12.9%	6.9%	2.0%	2.4%	15.3%	1.6%
Materials	3.0%	5.9%	6.9%	7.5%	9.7%	9.5%	12.7%	14.1%
Industrials	10.6%	14.9%	9.2%	25.8%	15.3%	22.0%	7.2%	15.6%
Consumer Disc.	8.2%	12.3%	7.7%	13.0%	13.8%	20.3%	4.7%	16.2%
Consumer Staples	12.6%	3.0%	12.0%	5.7%	6.9%	9.8%	5.8%	8.7%
Health Care	13.9%	13.2%	11.1%	8.8%	6.0%	5.6%	2.7%	4.7%
Financials	13.7%	21.6%	21.5%	19.5%	25.2%	19.8%	22.7%	21.0%
Information Tech.	15.6%	16.1%	3.0%	8.7%	9.2%	8.7%	11.0%	13.4%
Telecom Serv.	3.8%	1.1%	8.1%	1.3%	4.4%	0.3%	13.7%	1.5%
Utilities	4.3%	6.2%	7.8%	2.7%	7.5%	1.7%	4.3%	3.4%

[9] Pharmaceuticals had a weight of 5.8% in MSCI ACWI and a weight of 1.4% in the MSCI ACWI Small Cap Index, as of November 30, 2011. Conversely, biotech companies had a weight of 0.7% in large/mid caps and a weight of 1.8% in small caps.

[10] Eleswarapu and Tiwari (1996), Jensen, Mercer, and Johnson (1996), Lofthouse (2001), and Conover, Jensen, and Mercer (2008) are good references for a discussion of sector performance and business cycles.

Sector Weights of Small Caps (November 30, 2011)

B. Active Weights



Source: MSCI. Note: Shown are weights to the GICS sectors for the MSCI Small Cap indices relative to the MSCI Standard indices.

(2) **Foreign Exposure:** Foreign sales are a less-explored dimension where small caps may differ from large and mid caps. Exhibit 7 shows the percentage of company sales which comes from abroad. Small caps overall have been less reliant on foreign sales which helps diversify performance during global shocks. What is particularly striking is the variation across regions. Europe has the highest percentage of foreign sales with a prominence of small entrepreneurial exporting companies. Note that for European countries, sales which come from outside the country but within the region still count as foreign sales. When European-to-European country sales are excluded as foreign sales, the figures for Europe drop closer to the other regions but still remain higher than North America and Asia Pacific. Meanwhile in the other regions, economies are much more domestically oriented. Particularly in emerging markets, small caps provide exposure to local consumer sectors.

Exhibit 7: Foreign Exposure Measured by Percentage of Sales from Foreign Countries, 2002-2010 (Weighted by Market Capitalization)

	Global Total		North America		Europe		Asia Pacific		Emerging Markets	
Year	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small
2002	41	27	29	18	68	52	35	24	30	24
2010	49	32	41	24	77	61	42	28	31	24

Source: MSCI, Worldscope. Foreign sales are aggregated for constituents of the various regions. The data is as of December 31 for the years shown.

(3) **Strategic Shareholder Profile:** Another lesser-known set of differences concerns the strategic shareholders for small caps relative to large/mid caps. As part of the identification of free float market capitalization, MSCI evaluates the percentage of a company's full market cap owned by strategic shareholders, including governments, banks, principal officers and board members, and employees. Exhibit 8 categorizes shareholders into management/founders (including company founders and families in family-owned businesses), employees, and local government. Small caps are more likely to be owned by management/founders and are less likely to be local government-owned. Comparing different regions, what is notable is the high percentage of ownership by management/founders in Europe and emerging markets which tend to have more small entrepreneurial companies.

Exhibit 8: Strategic Shareholder Differences (Percentage of Market Cap Owned by Shareholder Category, June 2011)

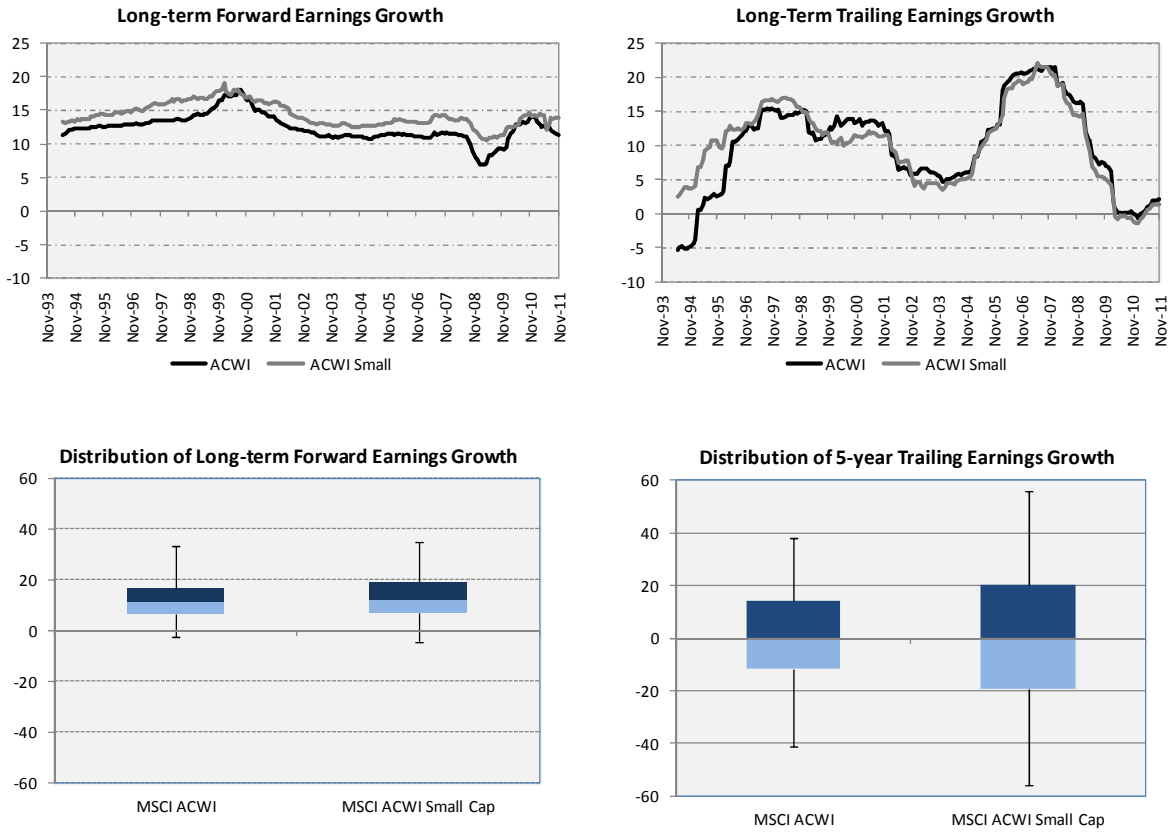
	World		North America		Europe		Asia Pacific		Emerging markets	
	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small	Large/Mid	Small
Mgmt/Founders/ESOP	13.9	21.8	6.5	13.2	20.6	31.2	18.4	28.5	33.8	43.9
Local Govt	1.6	0.4	0.0	0	4.2	1.3	1.5	0.3	6.6	2.0
Others	4.6	5.4	1.5	2.2	5.7	4.2	8.3	11.9	6.5	3.9
Total	20.1	27.6	8.0	15.3	30.5	36.7	28.1	40.8	47.0	49.8

Source: MSCI. Data as of June 2011. Select categories are shown. The strategic holder classifications are internal MSCI definitions for the purpose of calculating company float. Management ownership includes direct ownership by management, or other company ownership for management control. Others includes banks, insurance companies, treasury stocks, and lock-up shares. They are reviewed once a year.

(4) **Growth and Valuation:** Often institutional investors expect small caps to deliver superior earnings growth[11]. Exhibit 9 shows the long-term forward and trailing earnings growth for large/mid caps versus small caps. Small cap forward earnings-per-share has historically been higher meaning analysts expect higher growth. Interestingly, however, historical small cap growth has not been much different from large/mid caps. That is, the small cap premium is *not* a proxy for realized growth. This somewhat unintuitive result has been explained in past academic literature by over-optimism in analyst growth forecasts (see for instance Lakonishok, Shleifer, and Vishny (1994)). We note however that the range or dispersion of historical growth has been higher for small caps so that the great small cap growth stories investors seek (e.g. Hennes & Mauritz, Novo Nordisk) have in fact occurred but because there are just as many small cap companies that fail, they wash out in average.

[11] There remains an ongoing debate among academics as to the link between growth attributes and stock price performance. Most of the evidence suggests that growth stocks do not systematically earn higher stock returns precisely because of this over-optimism; see Lakonishok, Shleifer, and Vishny (1994). However, others have found growth stocks do outperform under certain conditions. Skinner and Sloan (2000) show that growth stocks earn positive returns once negative earnings surprises are controlled for. Lee and Song (2003) show that growth outperforms value conditional on the investor sentiment regime.

Exhibit 9: Historical Earnings Growth for Small Caps (Forecast versus Realized, November 2003-November 2011)



Source: MSCI, I/B/E/S. Distributions are based on 5th, 25th, 50th, 75th and 95th percentiles of index constituent ratios as of November 30, 2011.

Current regional differences in earnings growth, as well as other fundamentals, are shown in Exhibit 10. Expected growth for small caps has historically been higher than for large/mid caps but these expectations have not been realized in practice (except in Japan in recent years). Valuation metrics such as P/B, P/CE, forward P/E, and P/E have varied over time. Historically, price-to-book has been lower for small caps but their attractiveness is less stark than 10 years ago. Today, small caps have slightly lower price-to-book ratios than large and mid caps. On the other hand, they have a higher price-to-earnings ratio (except for in Japan); in past periods small caps were more attractively priced as reflected in P/E (1998-2002, for instance), while in other periods they were not (2003-present).[12] The US and Europe stand out as regions where current P/E and forward P/E are relatively higher for small caps.

[12] The link between valuation (mainly book-to-price or earnings-to-price firms) is as well-studied as the small cap premium. So-called value stocks, stocks with lower P/B and P/E, have historically earned excess returns resulting in the famous "value premium" popularized by Fama and French (1993). Small caps' lower P/B than large caps could in theory explain part of their strong returns.

Exhibit 10: Company Fundamentals for Small Caps Differ from Large/Mid Caps (December 30, 2011)

	ACWI	ACWI Small Cap	USA	USA Small Cap Cap	Europe	Europe Small Cap	Japan	Japan Small Cap	Pacific ex Japan	Pacific ex Japan Small Cap	EM	EM Small Cap
LT Forward EPS Growth	11.2	13.5	12.0	13.6	9.0	13.4	10.4	13.3	9.8	11.5	13.8	15.8
LT Historical EPS Growth	2.5	1.2	5.1	1.6	-1.7	-1.1	-13.2	-5.1	2.4	-1.0	12.2	11.2
Yield	2.9	2.3	2.2	1.5	4.2	3.4	2.7	2.4	4.5	4.4	3.0	3.2
ROE	12.6	7.5	14.8	8.5	12.4	7.2	5.0	5.2	13.0	7.0	14.7	7.4
P/B	1.6	1.3	2.0	1.8	1.4	1.2	0.9	0.7	1.5	1.2	1.6	1.1
P/CE	7.8	8.4	8.9	9.7	6.9	7.2	5.7	5.9	8.8	10.3	6.9	7.8
Forward P/E	10.6	12.9	11.2	15.3	9.8	11.5	11.6	11.1	11.0	10.6	9.1	9.0
P/E	12.8	17.9	13.9	20.7	11.2	16.3	18.6	14.3	11.7	16.5	10.7	14.8

Source: MSCI

In this section, we highlighted many of the differences between small caps and their large/mid cap counterparts. What should be clear is that small caps capture elements of the global opportunity set that are quite different from large/mid caps. Returns to small caps appear to have a significant component that is not readily explained by the sources of return they share with large/mid caps. Moreover, the characteristics of small caps can be quite different from that of large/mid caps. These differences can also vary by region. In Europe, for instance, the small cap investment story has been centered on small entrepreneurial companies exporting capital and consumer goods, and on retail and health care companies. In the US, in contrast, the small cap story has focused on the small technology stocks that have experienced rapid growth.[13]

[13] Over the January 1997 to December 2011 period, for instance, the Information Technology sector was the best performing sector in the US. It contributed 21 bps of annualized return to a total relative return of 91 bps to performance of the MSCI USA Index relative to MSCI ACWI.

Section III: Accessibility and Trading Costs

We have so far focused on the characteristics of small caps, highlighting the fact that they are different from large/mid caps such that they become an important active bet if left out of the equity universe. In the next two sections (Sections III and IV), we turn to accessibility and implementation issues related to small caps.

Regarding small cap accessibility, key concerns for investors have typically been: (1) their availability (2) their liquidity, and (3) their trading costs. Let's address these concerns in order. On the left side of Exhibit 11, we show the average free float of small caps relative to large/mid caps as a percentage of total shares. In developed markets (MSCI World), for instance, small caps have an average percentage float of 75% versus 82% for large/mid, as of November 2011. The difference is not large.

Exhibit 11: Float and Liquidity Characteristics of MSCI Index Constituents (November 30, 2011)

Average Float (in %)	Large / Mid cap companies	Small companies	Average ATVR (in %)	Large / Mid cap companies	Small companies
ACWI	73	68	ACWI	130	132
World	82	75	World	113	91
EM	56	52	EM	164	229
USA	94	87	USA	81	77
Europe	73	67	Europe	133	83
Japan	76	62	Japan	156	129
Pacific ex Japan	72	61	Pacific ex Japan	117	105

Source: MSCI. All analysis based on MSCI ACWI IMI constituents as of November 30, 2011

Second, the right side of Exhibit 11 shows a measure of liquidity,[14] the average Annual Traded Value Ratio (ATVR) across stocks in each universe. MSCI employs ATVR to screen out extreme daily trading volumes, taking into account the free float-adjusted market capitalization size of securities.[15] The lower the ATVR, the less liquid the security. Again, the average ATVR for developed small caps (91%) is not much lower than that for developed large/mid caps (113%).[16]

The results above are important in that they point to a common misperception on the part of investors. There are in fact two distinct segments of small caps – those that are investable and those that are not. The difference between the two is not trivial. The MSCI Global Investable Market Indices methodology, for instance, upholds investability screens for all equities to be included in the MSCI Small Cap Indexes. These include size requirements, free-float adjusted market capitalization requirements, liquidity requirements, trading length requirements, and foreign accessibility requirements (see MSCI Global

[14] Liquidity can be measured in a variety of ways including trading volume, bid-ask spreads, etc. Sometimes free float is used to reflect liquidity as well.

[15] ATVR is computed as follows. First, monthly median traded values are computed as the median daily traded value multiplied by the number of days in the month that the security traded. The daily traded value of a security is equal to the number of shares traded during the day multiplied by the closing price of that security. Second, the monthly median traded value of a security is divided by its free float-adjusted security market capitalization at the end of the month, giving the monthly median traded value ratio. Finally, the 12-month ATVR is obtained by taking the average of the monthly median traded value ratios of the previous 12 months – or the number of months for which this data is available (previous 6 months, 3 months or 1 month) – and annualizing it by multiplying it by 12.

[16] And interestingly, the average float can be higher for small caps as in the case of emerging market stocks in Asia and EMEA. Somewhat counterintuitively, the relationship between ATVR and market capitalization is not directly parallel. ATVR can be low for certain larger cap names and vice versa.

Investable Market Indices Methodology (2012) for details). In the recent November 2011 Semi-Annual Index Review, approximately 27% of the names of the eligible universe of small caps (accounting for approximately 8% of the float-adjusted market capitalization) were screened out and excluded.[17] Note that throughout this paper, we have used only investable small caps as captured by the MSCI Small Cap Indices in our analyses.

Third, what about trading costs? Relative to large and mid caps, trading costs have been and continue to be higher for small caps. Sample commission costs provided by ITG are shown in Exhibit 12. What is striking is the similarity between non-US and US commission costs (with the exception of Canada). Moreover, the spread between costs for large/mid caps and small caps is in many cases smaller (e.g., UK, Europe ex UK, Japan, Pacific ex Japan, and Emerging Markets).

Exhibit 12: Trading Costs (Commission Costs for 2Q10 – 1Q11, Average, Basis Points)

Region	Large Cap	Mid Cap	Small Cap	Micro Cap
US	7.0	10.7	19.6	25.5
Canada	8.7	18.8	37.1	49.4
UK	10.2	11.6	15.9	19.3
Europe ex UK	10.2	11.5	13.2	12.2
Japan	8.8	8.8	8.5	9.0
Asia Pacific ex Japan	13.7	15.3	15.2	18.1
Emerging Markets	18.1	18.5	17.4	16.1

Source: ITG (ITG's Global Cost Review 2011/Q1)

Historical trading costs outside the US are difficult to obtain but evidence suggests that trading costs have fallen significantly over time and continue to do so. In the US, Chalmers, Edelen, and Kadlec (1999) found commission costs in 1987 averaging 20 bps for what was mostly a large cap sample. In contrast, the 7 bps shown in Exhibit 12 represents a substantial decrease. Domowitz, Glen, and Madhavan (2000) published one of the earliest studies of non-US trading costs. There, they found brokerage and commission costs substantially higher than what we see today. For instance, they estimated costs of 37.7, 59.8, 41.3, and 54.5 bps for Germany, Hong Kong, Japan, and the UK, respectively.

Commission costs though are only one part of transaction costs. Implementation shortfall (bid-ask spread plus market impact) costs[18] are typically much higher. For US large cap stocks, ITG average estimates for Second Quarter 2010 to First Quarter 2011 are 7.0 bps for commission costs and 31.7 bps for implementation shortfall costs. For US small caps, ITG estimates 19.7 bps for commission costs and 110.8 bps for implementation shortfall costs. Implementation shortfall costs by size segment outside the US are not provided publicly; however we estimate that non-US developed small caps may have shortfall costs somewhere in the neighborhood of 120-140 bps. Emerging market small caps are likely much higher in the neighborhood of 180-220 bps.

[17] As part of the index construction, MSCI first identifies an eligible stock universe which is comprised of securities that meet the eligibility constraints relating to share classes and share types, as described in the MSCI Global Investable Market Indices methodology, and meet the minimum equity size requirement ($119 million as of the November 2011 Semi-Annual Index Review.) (For developed markets, these included all stocks with a market cap between $119 million and $3.38 billion. For emerging markets, these included all stocks with a market cap between $119 million and $1.69 billion). Combining developed and emerging markets, the small cap eligible universe in November 2011 had 10,133 securities. After the investability screens were applied, there remained 7,395 stocks. These 7,395 stocks represent 92% of the eligible universe's float-adjusted market cap.

[18] Implementation shortfall costs are provided by ITG; for details on the methodology please refer to ITG Research.

There may be additional costs we do not report here such as taxes and overhead or administrative costs. Taxes for instance must be factored in for some countries; the UK for instance has a "stamp duty reserve tax" (SDRT) of 50 bps. However, most tax regulations apply equally to companies of all market size. Meanwhile, overhead and administrative costs are generally higher for small caps in that the number of names for small cap universes tends to be much larger, thus requiring more in the way of tracking corporate actions, filing required paperwork, and other costs that fall outside of trading.

In sum, small caps in general continue to be less accessible than large and mid caps. However, accessibility issues appear to have eased over time as markets and trading environments have evolved. Moreover, while costs remain higher, non-US developed market small caps are surprisingly on par with US small caps where small cap managers are abundant.

Evaluating the Impact of Trading Costs

The key question for investors is whether the cost hurdle is significant enough to justify not holding small caps. How much of the small cap premium is eaten by the higher transaction costs? This may vary depending on the characteristics of the small cap portfolio resulting from the institutional investor's implementation choice (segregated or all cap; active or passive, concentrated or not). A starting reference point could be the trading costs associated with a simple passive replication. In Exhibit 13 we examine the turnover and trading costs of two separate portfolios, one large/mid cap portfolio tracking MSCI ACWI and a small cap portfolio tracking the MSCI ACWI Small Cap Index. In the first column we have the one-way annual turnover. In the third column, we show the turnover as a percentage of the entire large, mid, and small cap (IMI) universe by multiplying each segment by its weight in the universe. We use conservative trading cost assumptions in the fourth column and multiply turnover by trading costs to get the trading costs as a percentage of the portfolio's value in the last two columns.

Exhibit 13: Estimated Trading Costs in a Passive Replication of MSCI ACWI IMI

	One-Way % Annual Turnover *	Weight in IMI	Turnover As % of IMI	Trading Costs (TC) in bp	One-way TC in bp of IMI	Two-way TC in bp of IMI
Large/Mid Cap (Standard)	2.95	86%	2.54	60	1.5	3.0
Small Cap	13.68	14%	1.91	160	3.1	6.1

* Averages 2008-2011 for MSCI ACWI, MSCI ACWI Small Cap and MSCI ACWI IMI. Source: MSCI, ITG

The one-way turnover of the MSCI ACWI Small Cap Index was 13.68% on average over the last four years. Multiplying it by the small caps' weight in the Investable Market Index (IMI) of 14%, this translates into a turnover of 1.91% of the IMI. Using a very conservative 160 bps for trading costs, including implementation shortfall described earlier, the two-way trading costs would detract 6.1 bps from the performance of the IMI. This is the number to compare to the incremental return of adding small caps to the large and mid cap portfolio which was 60 bps over the last decade. Therefore it would appear that the higher trading cost argument alone could hardly justify a decision to disregard global small caps.

Clearly different implementation approaches could incur higher or lower transaction costs. Consider a portfolio passively replicating MSCI ACWI IMI without separating out large/mid caps and small caps into separate portfolios. This portfolio would have incurred an annual turnover of 3.03% over the last four

years compared to the 4.45% incurred by two portfolios independently tracking the large-mid cap and the small cap benchmarks. This is because stocks migrating from one capitalization segment to the other would not need to be removed from the total equity portfolio. There would be lower turnover for both large/mid and small cap stocks and the trading costs for just the small cap segment would, all else equal, be lower than the 6.1 bps we calculated earlier.

So far we have ignored the initial cost of investing in small caps. This amount, of course, is not trivial. With the same assumptions as before, our first example would result in a cost close to 45 bps for the initial investment. It is still lower than the 60 bps of small cap premium but is large enough to warrant a well-defined program which takes into account the cyclical aspects of small caps.

Section IV: Implementation Choices for Institutional Investors

The passive portfolio example described in the previous section is only one of many options institutional investors have for accessing small caps. What are the various implementation choices? These fall along several dimensions:

(1) active vs. passive management;

(2) external mandate vs. internal management;

(3) a segregated small cap portfolio vs. small caps integrated in an all-cap portfolio; and

(4) a global versus regional mandate

Currently, the largest segment is comprised of active, externally managed, segregated (dedicated), regional managers. Small caps have traditionally been seen as a specialty area where active managers can mine a great deal of value through a detailed knowledge of specific industries and companies. Because of this perception, the other options – passive, internal, all-cap, and global—have all been less prevalent historically.

However, all these options have experienced growth in recent years. The rapid creation of institutional passive products in global small caps has reinforced the argument that passive options are increasingly attractive for institutional investors who either cannot find or do not have the resources to find skilled active managers. In the absence of active management options, there is a strong argument that institutional investors should seek beta exposure through passive allocations instead of foregoing the beta return entirely.

We start by looking at the eVestment Alliance database, which contains self-reported manager information. This database captures a substantial sample of institutional mandates, at least in the US. (Similar consolidated databases are unavailable for Europe and Asia.) Exhibit 14 summarizes the current landscape of small cap products. Of managers reporting to eVestment, there were 572 dedicated US small cap products and 74 dedicated global/non-US small cap products reported as of September 2011. The US small cap products report assets under management that are about 6.5 times greater than the global/non-US small cap products. Across all cap sizes and in small caps, global products remain far fewer than regional products, and dedicated small cap products remain fewer than large, mid, and all cap products.

With 74 products and USD 97 billion AUM, the opportunity set for non-US small caps is non-negligible. The segment is still however only a fraction of the 572 small cap products in the US capturing USD 641 billion. One of the most striking observations is how many more all cap products there are across all the regions than small caps. Unfortunately, only a small proportion of these managers are actually benchmarked to an all-cap benchmark, and this is particularly so outside the US. For instance, out of the 169 managers identified as Global, only 13 are benchmarked to an index which contains small caps. In fact, 150 of these have a large/mid cap benchmark (the remaining 13 are unclassified). These findings highlight a significant problem of benchmark mismatch.

Exhibit 14: Small Cap Product Landscape (Summary of Managers with Significant Base, September 2011)

Region	Size segments	Number of Managers	AUM (in billions)	Number of Active Managers	Active Manager AUM (in billions)	Number of Passive Managers	Passive Manager AUM (in billions)
US							
	Total	1906	5,225	1,776	3,734	130	1,491
	Standard	1103	3,683	1,012	2,564	91	1,119
	Small cap	572	641	549	558	23	83
	All cap	231	901	215	612	16	289
EAFE							
	Total	258	845	243	637	15	209
	Standard	143	567	130	360	13	207
	Small cap	36	51	34	49	2	2
	All cap	79	227	79	227	0	0
ACWI ex US							
	Total	137	529	135	501	2	28
	Standard	70	272	69	261	1	11
	Small cap	19	19	19	19	0	0
	All cap	48	238	47	221	1	17
Global equity							
	Total	385	1190	374	1118	11	72
	Standard	197	453	186	380	11	72
	Small cap	19	27	19	27	0	0
	All cap	169	710	169	710	0	0

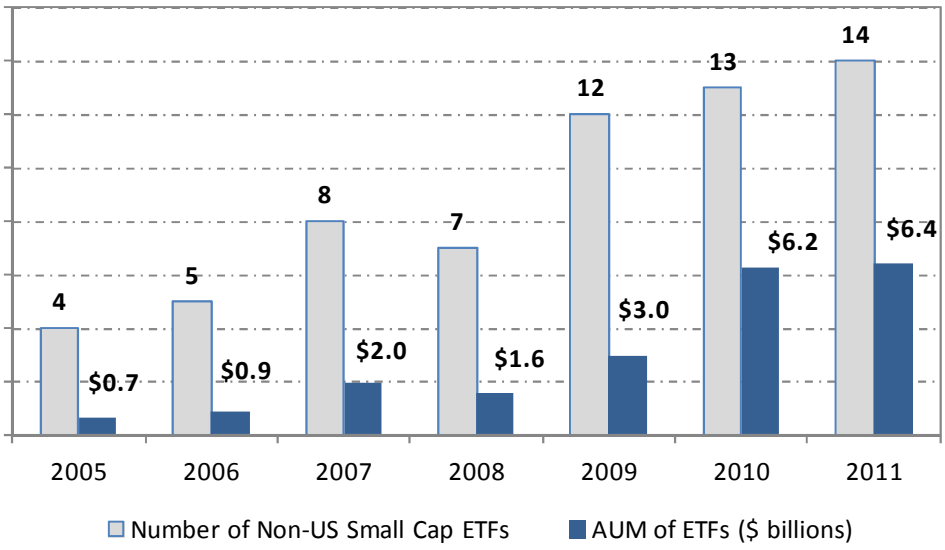
Source: eVestment, MSCI. Active and passive funds data comes from eVestment. Only funds with at least USD 100 million AUM are shown above. Small/mid-cap (SMID) products are also included.

Finally, Exhibit 14 also highlights the relatively larger proportion of active funds in the database. There are in fact only a handful of non-US passive products for small caps—only 2 funds with assets under management greater than $100 million, a topic which we address next.

Passive Options for Capturing Small Cap Beta

Given the current limits for hiring passive non-US small cap managers, what alternatives are open to institutional investors? First, we have seen strong growth in the breadth of exchange-traded-funds (ETFs). In September 2008, there were just 7 ETF products with USD 1.5 billion AUM. Today there are two times as many ETF products with USD 6.5 billion AUM. Exhibit 15 highlights the year to year growth in the non-US small cap ETF space.

Exhibit 15: Rapid Expansion in ETF Products with Significant Base



Source: MSCI, DeutscheBank, FactSet. Only ETFs with USD 100m AUM are included. Data as of September 30 of each year.

A second option for institutional investors is to manage small cap portfolios internally. Given the turnover and trading cost analysis discussed in Section III, full replication passive portfolios are a viable option; however, optimization techniques can also be used for the construction of non fully-replicating index-tracking portfolios. Exhibit 16 shows portfolios with fewer names than select MSCI Small Cap Indices constructed via optimization. Rebalancing quarterly, we can achieve lower turnover levels than the indices themselves and with reasonable tracking error. Appendix 3 contains additional details on the optimization procedure.

Exhibit 16: Passive Portfolios Can Be Constructed for Small Caps (Results of Optimizations Using US and Europe Small Caps, Quarterly Rebalancing, May 2008 to September 2011)

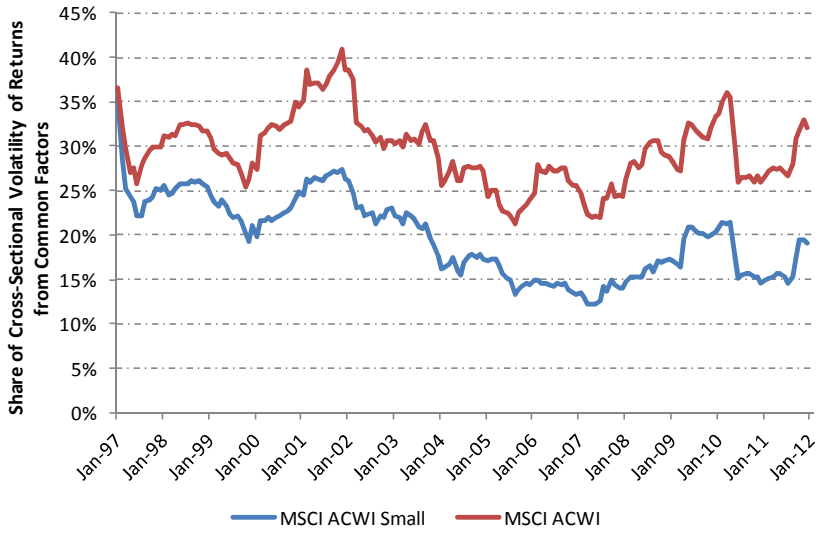
US Small Cap Portfolio	Annualized Tracking Error	Average Annual Turnover	Average Number of Names	Europe Small Cap Portfolio	Annualized Tracking Error	Average Annual Turnover	Average Number of Names
Benchmark	-	16.0%	1,907	Benchmark	-	16.3%	1,114
100 stock limit	3.3%	43.7%	100	100 stock limit	3.4%	18.5%	100
300 stock limit	2.1%	18.9%	300	300 stock limit	1.9%	11.5%	300
500 stock limit	1.6%	13.6%	499	500 stock limit	1.8%	9.6%	498
700 stock limit	1.4%	11.9%	697	700 stock limit	1.5%	9.0%	695
1000 stock limit	1.1%	11.0%	992	1000 stock limit	1.3%	8.4%	980
1500 stock limit	1.1%	10.5%	1,154				

Source: MSCI. For the US, we use the Barra Market Impact Model for transaction costs. Outside the US, we assume a fixed transaction cost of 20 bps per value traded. The US portfolio uses the Barra USE3L model as the risk model. The European portfolio uses the Barra EUE3L model. For further details, see the Barra US Equity Model Handbook and European Equity Model Research Notes.

A Fertile Field for Active Managers

The alternative to passively investing in small caps is to choose a global or regional small cap active manager. There are many reasons why institutional investors may choose active over passive. Because information on small caps is less widely available, in theory, analyst research can generate more value-added insights. Similarly, small cap stocks are more heavily impacted by company specific characteristics, favoring a bottom-up stock picking investment process. Exhibit 17 shows the contribution to the cross-sectional dispersion of returns for the global large/mid cap universe versus the small cap universe. These characteristics may favor regional rather than global small cap mandates in order to benefit from managers' stock picking skills and local knowledge.

Exhibit 17: Small Cap Stock Returns Are Less Driven by Systematic Sources (Explained-to-Total Cross Sectional Volatility Ratio, Constituents of MSCI ACWI and MSCI ACWI Small Cap Index, USD Cap-Weighted, January 1997 to December 2011)



Note: Systematic sources of risk are defined by the common factors in the Barra Global Equity Model (GEM2). There are 134 factors in the model. Here, we take the standard deviation of cross-sectional component returns for individual stocks, where the component returns are the contribution to return in aggregate from the factors to each stock. The ratio of the computed standard deviation to the total cross-sectional volatility is shown. Standard deviations are computed with a weighting scheme based on market capitalization of the individual stocks. The ratio is smoothed by taking the average over the past 12 months.

We note however there remains a vigorous debate about the ability of active small cap managers to generate outperformance (either measured by alpha relative to a benchmark or alpha relative to large/cap manager alphas). A number of studies suggest that small cap managers can add value. For US small caps, these include Keim (1999), Christopherson et al. (2002) and Gorman (2003); and for European small caps, these include Dahlquist et al. (2000), Otten and Bams (2002) and Engstrom (2004). However other studies have provided contrary evidence. Studies along these lines include Blitzer and Dash (2002), Ennis and Sebastian (2002), Davis et al. (2007), and Kang, Nielsen, and Fachinotti (2011)—all based on US small cap managers.

In Exhibit 18, we show the returns, tracking error, and information ratios (IRs) reported by US versus non-US small cap managers. Managers are grouped into quartiles based on their tracking error. The median figure is reported for each group. We find that over the last 10 years non-US small cap managers have not earned higher IRs than US small cap managers.

Exhibit 18: Performance after Fees (Median Manager by Category Ranked by Excess Returns, 10 Years Ending for Managers with a Significant Base, September 2011)

	Excess Return over Benchmark (%)	Tracking error (%)	IR
US Small Cap Managers			
Low Risk Managers	0.73	4.65	0.16
All Managers in the Universe	1.25	6.80	0.18
High Risk Managers	1.57	10.00	0.16
Non-US Small Cap Managers			
Low Risk Managers	-0.03	3.36	-0.01
All Managers in the Universe	0.45	5.31	0.09
High Risk Managers	0.73	7.23	0.10

Source: eVestment Alliance. Only products with at least USD 100 million AUM are considered. We include all managers including Core, Value, and Growth. For non-US managers, we consider MSCI ACWI ex-US, EAFE, and Global Equity managers as part of our sample. The universe of managers is first grouped by tracking error. Low risk managers are the first quartile while high risk managers are the fourth quartile. Second, managers are ranked by excess returns within each category. The median manager within each category is reported in the table. Returns are reported in USD relative to the managers' reported benchmark.

Overall, the issue of whether active management in small caps is rewarded continues to be one of ongoing research. The good news for institutional investors is the growing array of choices should they decide to go with active mandates. The challenge however is the time and effort needed to select appropriate managers. An emerging alternative half way between passive beta exposure and active management may be to use alternative weighting schemes within small caps as a way of efficiently capturing additional risk premia in small caps such as value.

Conclusion

When evaluating global equities in asset allocation, the natural starting point for the global equity universe should include global large, mid, and small caps, which is the investable opportunity set available to investors. Outside the US, however, small caps remain relatively underowned by institutional investors. Here, we argue that leaving out small caps is a significant "active" decision which investors may be making unconsciously. This decision represents a 14% underweight in the portfolio. In fact, excluding small caps amounts to a negative view on the small cap premium. Had an investor allocated to a global equity universe comprising large, mid, and small caps, annualized return would have been 5.4% (for MSCI ACWI IMI) over the last decade, an incremental gain of 60 basis points annually over MSCI ACWI. Moreover, foregoing small caps historically would have consumed a substantial part of a plan's risk budget, in the range of 50% to 75%.

There are various reasons why institutional investors have refrained from small caps. First, some are content with the implicit small cap exposure they get through their large and mid cap managers who often invest opportunistically in small caps. This is an inefficient approach. Not only is the risk budget (which should be allocated to find alpha) consumed in part by a beta small cap exposure, but these managers are then rewarded for this beta exposure.

Second, it is often argued that small cap investing is more resource-intensive because there are more companies to cover and information is less readily available. Some have argued it is harder to find good small cap managers, particularly outside the US, and there is more downside risk if poor managers are chosen. To this, we counter that institutional investors should seek beta exposure through passive allocations. Foregoing the beta return to small caps because the right active managers cannot be found is suboptimal. In addition, an alternative between passive beta exposure and active management may be to use alternative weighting schemes within small caps as a way of efficiently capturing additional risk premia within small caps such as value.

Third, there is the argument that passively replicating small caps is complicated by their lower liquidity and higher trading costs. Here, we show that while trading costs for small caps are generally higher and liquidity is generally lower, the differences are not as large as what may have been conventionally believed. Moreover, turnover levels for small cap allocations are not excessive, meaning that even high costs are not insurmountable. It may not be surprising then that the availability of active and passive small cap products continues to expand, giving institutional investors an increasing set of options for accessing the small cap premium. If more institutional investors embrace this segment, liquidity is likely to improve which in turn drives the creation of products, resulting in a virtuous cycle.

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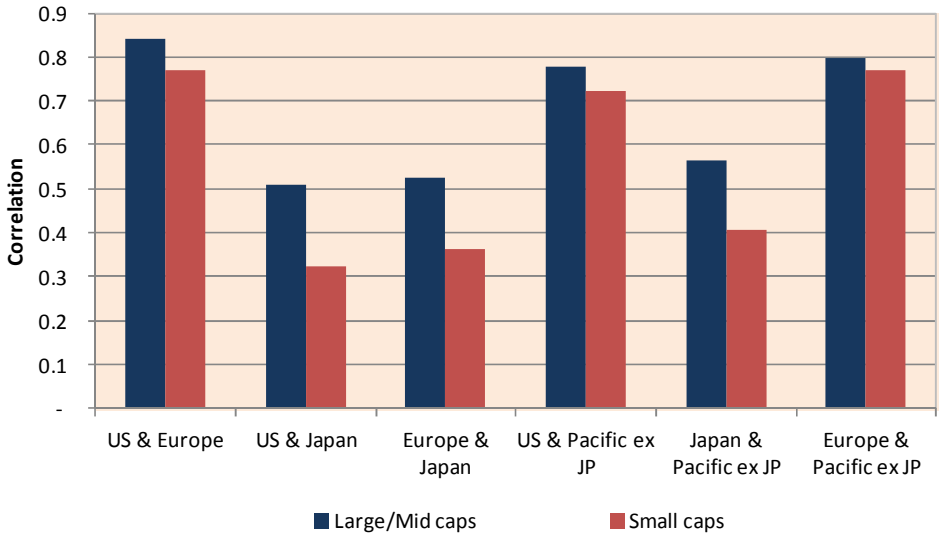
Appendix 1: Additional Characteristics of Small Cap Stocks

Exhibit A1: Adjusted Market Capitalization (USD, Billions, December 30, 2011)

	Large/Mid Cap (Standard)	Small Cap
ACWI	25,752	3,903
USA	11,855	2,005
Europe	6,129	677
Japan	2,050	381
Pacific ex Japan	1,251	201
EM	3,241	417

Exhibit A2: Correlations Between Small Caps Across Regions Are Lower than Equivalent Correlations Between Large/Mid Caps (Correlations between MSCI Standard Indices in Each Region and Correlations between MSCI Small Cap Indices in Each Region, Monthly Returns, June 1994 to December 2011)



Note: Large/mid caps are represented by the MSCI Standard Indices for respective regions. Small caps are represented by the MSCI Small Cap Indices for respective regions. Gross returns are used. Simulated history is used prior to June 2008. Europe and Asia include only developed markets. Source: MSCI

Appendix 2: Attributing the Performance of Small Caps

Exhibit A3 summarizes the results of attributing the returns of MSCI ACWI IMI relative to MSCI ACWI.[19] The first two approaches show the return attributable to sectors and regions, respectively. The returns from "Selection" are those that cannot be explained by them. In the Factor Approach, we use the Barra Global Equity Model (GEM2) to attribute returns. Common factors include countries, industries, and 8 style factors capturing investment styles and risk premia. (Note that one of them is in fact a factor that captures the size of companies but the amount of return it explains is relatively small). Again, as in the other two approaches, the specific return accounts for 108 bps of the active return of 150 bps. In other terms while common factors do explain part of the incremental return of small caps, it is only a part. Stock specific factors appear to play a much bigger role, and that makes smalls caps a truly different segment from a return perspective.[20]

Exhibit A3: Attribution of MSCI ACWI IMI Returns with MSCI ACWI as Benchmark (January 2003 to November 2011)

(1) Brinson Approach (Sectors)	
Active Return (USD)	1.67%
Local Active Return	1.50%
Return from Allocation across Sectors	-0.02%
Return from Selection within Sectors	1.51%
(2) Brinson Approach (Regions)	
Active Return	1.67%
Local Active Return	1.50%
Return from Allocation across Regions	0.12%
Return from Selection within Regions	1.37%
(3) Factor Approach	
Active Return	1.67%
Local Active Return	1.50%
Common Factor	0.41%
Specific	1.08%

The factor approach uses the Barra Global Equity Model (GEM2). There are five regions used in the Brinson "regional" approach: Asia Pacific, EMEA, Latin/South America, North America, and the rest of the world. Sectors are the 10 2-digit GICS sectors. Appendix 2 contains further details on the attribution.

The following tables show the detailed performance attribution results for MSCI ACWI IMI relative to MSCI ACWI. The former index includes small caps while the latter does not. In Exhibits A4 and A5, we use the Brinson framework for attribution, first using sectors as the decision variable, and second using regions. In both cases, excess return to MSCI ACWI IMI is mostly attributable to the Selection Effect

[19] The active return in this case essentially reflects the result of adding small caps.

[20] Whether what is currently accounted for under stock specific factors may include other yet unspecified common factors is a hypothesis that deserves more research.

which suggests that active weights to sectors and regions does not have significant return implications. In Exhibit A6, we use the attribution using a factor-model framework. The factor model used is the Barra Global Equity Model (GEM2). Consistent with the Brinson results, much of the return comes from specific (or idiosyncratic) sources.

Exhibit A4: Brinson Attribution of MSCI ACWI IMI Using GICS Sectors (January 2003 to November 2011, Benchmark = MSCI ACWI)

Source of Return	Cumulative Net Return	Cumulative Net Risk	Cumulative Information Ratio
Total Managed	-2.50%	24.72%	N/A
Total Active	1.67%	0.73%	0.71
Local Excess	1.50%	0.77%	0.6
Residual	1.50%	0.77%	0.6
Allocation	-0.02%	0.26%	-0.02
Selection	1.51%	0.60%	0.78
Market Timing	0.00%	N/A	N/A
Currency	0.18%	0.13%	0.43
Trading Effect	0.00%	N/A	N/A
Return adjustment	0.00%	N/A	N/A
Total Benchmark	-4.17%	24.31%	N/A

Source of Return	Return from Allocation Effect	Return from Selection Effect
Consumer Discretionary	0.17%	0.03%
Consumer Staples	-0.18%	-0.04%
Energy	0.00%	-0.08%
Financials	0.04%	0.82%
Health Care	0.01%	0.05%
Industrials	-0.03%	0.16%
Info. Tech.	0.03%	0.11%
Materials	0.00%	0.33%
Others	0.00%	0.00%
Telecomm.	-0.07%	-0.01%
Utilities	0.02%	0.15%

Exhibit A5: Brinson Attribution of MSCI ACWI IMI Using Regions (January 2003 to November 2011, Benchmark = MSCI ACWI)

Source of Return	Cumulative Net Return	Cumulative Net Risk	Cumulative Information Ratio
Total Managed	-2.50%	24.72%	N/A
Total Active	1.67%	0.73%	0.71
Local Excess	1.50%	0.77%	0.60
Residual	1.50%	0.77%	0.60
Allocation	0.12%	0.06%	0.61
Selection	1.37%	0.76%	0.56
Market Timing	0.00%	N/A	N/A
Currency	0.18%	0.13%	0.43
Trading Effect	0.00%	N/A	N/A
Return adjustment	0.00%	N/A	N/A
Total Benchmark	-4.17%	24.31%	N/A

Source of Return	Return from Allocation Effect	Return from Selection Effect
Asia Pacific	-0.03%	0.35%
EMEA	0.03%	0.31%
Latin-S America	0.03%	0.05%
N America	0.09%	0.66%
Rest of World	0.00%	0.00%

Exhibit A6: Factor Attribution of MSCI ACWI IMI Using GICS Sectors (January 2003 to November 2011, Benchmark = MSCI ACWI)

Source of Return	Cumulative Net Return	Cumulative Net Risk	Cumulative Information Ratio
Total Managed	-2.50%	24.72%	N/A
Total Active	1.67%	0.73%	0.71
Local Excess	1.50%	0.77%	0.60
Residual	1.50%	0.77%	0.60
Common Factor	0.41%	0.67%	0.19
World	0.06%	0.15%	0.13
Industry	0.05%	0.08%	0.18
Risk Indices	0.00%	0.00%	N/A
Country	0.30%	0.57%	0.16
Specific	1.08%	0.21%	1.58
Market Timing	0.00%	N/A	N/A
Currency	0.18%	0.13%	0.43
Trading Effect	0.00%	N/A	N/A
Return adjustment	0.00%	N/A	N/A
Total Benchmark	-4.17%	24.31%	N/A

Appendix 3: Information on Passive Replication

Our objective was to replicate an index with three goals:

- Control the number of names
- Control turnover to reduce transaction costs
- Minimize tracking error

Holding the maximum number of names always yields the lowest tracking error and lowest turnover. The fewer the number of names held, the higher the turnover and the higher the tracking error. Thus there is a tradeoff between the number of names (turnover) and the tracking error.

Ideally, we desire also to achieve positive realized alpha relative to the benchmark although the outcome will be random since the ex ante alpha will always be zero (since all alphas are zero).

We used Barra Aegis Automation Assistant (AAA) and Aegis Performance Analyst (APA) to create the optimized portfolios. All expected returns are zero, thus the objective function purely minimizes tracking error.

Paring constraints were used to control the number of names in the optimized portfolio. We set the maximum number of names to the desired target.

We ran optimizations relative to the MSCI small cap benchmarks for USA, Europe, and Asia ex Japan. Because of the transition to the MSCI Global Investable Market Indices Methodology in 2007-2008, there is a significant change in the number of names for all indices. Therefore, prior to May 2008, simulated index history must be used. Transaction costs were assumed for all optimizations. In the US we used the Barra Market Impact model. Outside the US, we assumed fixed costs per amount traded.

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The company's flagship product offerings are: the MSCI indices with approximately USD 7 trillion estimated to be benchmarked to them on a worldwide basis[1]; Barra multi-asset class factor models, portfolio risk and performance analytics; RiskMetrics multi-asset class market and credit risk analytics; MSCI ESG (environmental, social and governance) Research screening, analysis and ratings; ISS governance research and outsourced proxy voting and reporting services; FEA valuation models and risk management software for the energy and commodities markets; and CFRA forensic accounting risk research, legal/regulatory risk assessment, and due-diligence. MSCI is headquartered in New York, with research and commercial offices around the world.

[1] *As of June 30, 2011, based on eVestment, Lipper and Bloomberg data.*