The "New Classic" Equity Allocation?

A discussion on implementation of global equity allocation and evolving mandate structures

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MSCI RESEARCH
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Executive Summary

The recent financial crisis led many institutional investors to review their asset allocation policies and explore alternative approaches to implementation. MSCI recently held discussions around the world with major pension plans, asset managers, and investment consultants to understand different approaches to implementing equity allocation. Based on these consultations and our own research, this research insight provides a framework for the implementation of global equity allocation.

Investors who choose to adopt global equity allocation face the challenge of covering an opportunity set that spans developed and emerging markets and a range of market capitalizations. Defining the opportunity set of individual mandates is a critical consideration.

The continued evolution of global equity markets and investment processes calls for a review of traditional mandate structures. Traditionally, institutional investors partitioned the global investment opportunity set into geographic building blocks and allowed the corresponding manager line-up to reflect such mandate structure. More recently, investors increasingly assign global mandates based on a view that the nature of equity risk and return drivers no longer supports the partitioned equity mandate structure.

Our observation is that developed markets are driven mainly by global industry and style risk factors and less by differences across countries or regions. Compared to a domestic/international structure, global mandates enable managers to pick stocks from a global opportunity set and accommodate investment bets on global sector and style exposures.

Emerging markets, on the other hand, continue to have different risk and return dynamics, with local risk factors and country allocation as the dominant drivers. Some investors believe that managing emerging market equities requires a different investment process, and therefore may suit dedicated emerging market mandates.

Small cap stocks typically exhibit higher idiosyncratic risks than large/mid cap stocks. Thus, some investors prefer dedicated regional small cap mandates, aiming to benefit from the stock-picking skills and local knowledge of small cap specialists. Such dedicated mandates enable investors to introduce deeper and more systematic exposure to the small cap segment.

These findings indicate that the global equity allocation can be structured around three segments that suit different mandates:

- Developed markets large/mid cap
- Developed markets small cap
- Emerging markets

While the majority of active global mandates target only developed markets, some investors have recently allocated broader global mandates that encompass both developed and emerging markets. This trend may reflect further integration across these two market segments and the realization that many large companies in emerging markets have become global players, competing with their peers in developed markets. It may also reflect investors' beliefs in the potential benefits of investing in an unconstrained and broader opportunity set.

In summary, our findings suggest that global equity mandates, often complemented by dedicated emerging market and small cap specialist mandates, may be emerging as the "new classic" structure for implementing equity allocation. Investors who need or want to maintain a certain level of home bias can manage separate, domestic portfolios alongside the global equity structure.

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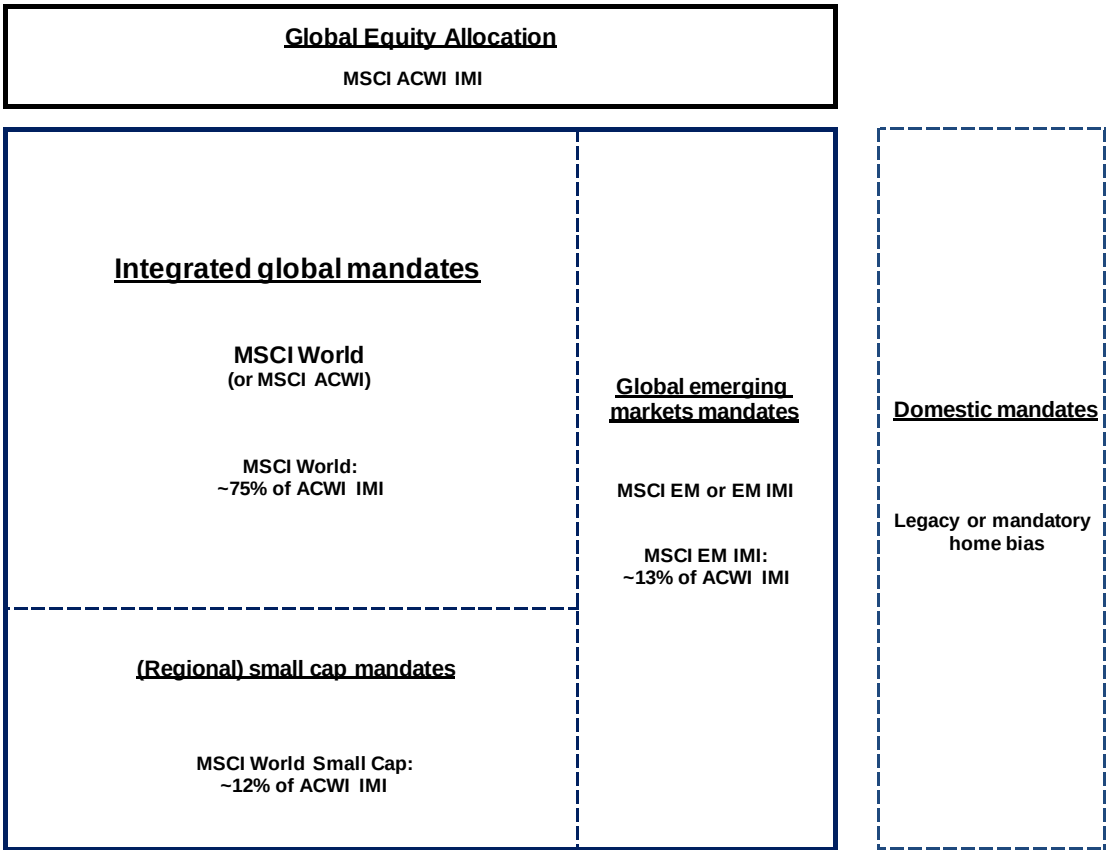
Such an implementation approach, as illustrated in Exhibit 1, can benefit from an integrated global equity investment process, while accommodating different risk and return drivers and investment processes in different market segments and legacy or mandatory home bias in equity allocation.

Exhibit 1: "New Classic" Equity Allocation?[1]



Note: MSCI ACWI IMI denotes the MSCI All Country World Investable Market Index that covers large, mid and small cap companies in developed and emerging markets. MSCI World covers the large and mid cap companies in developed markets. MSCI EM IMI denotes the MSCI Emerging Markets Investable Market Index that covers large, mid and small cap companies in emerging markets. The weights of MSCI World, MSCI World Small Cap and MSCI EM IMI in MSCI ACWI IMI represent their market capitalization weights as of September 2010.

This paper is the first in a series that focuses on current practices and emerging trends in the implementation of global equity allocation. Passive/active considerations are addressed and alternative approaches are explored in two forthcoming research papers.

[1] The structure illustrated here addresses active mandates. If an investor decides to go passive across the whole global equity allocation, then the mandate structure is a less critical consideration.

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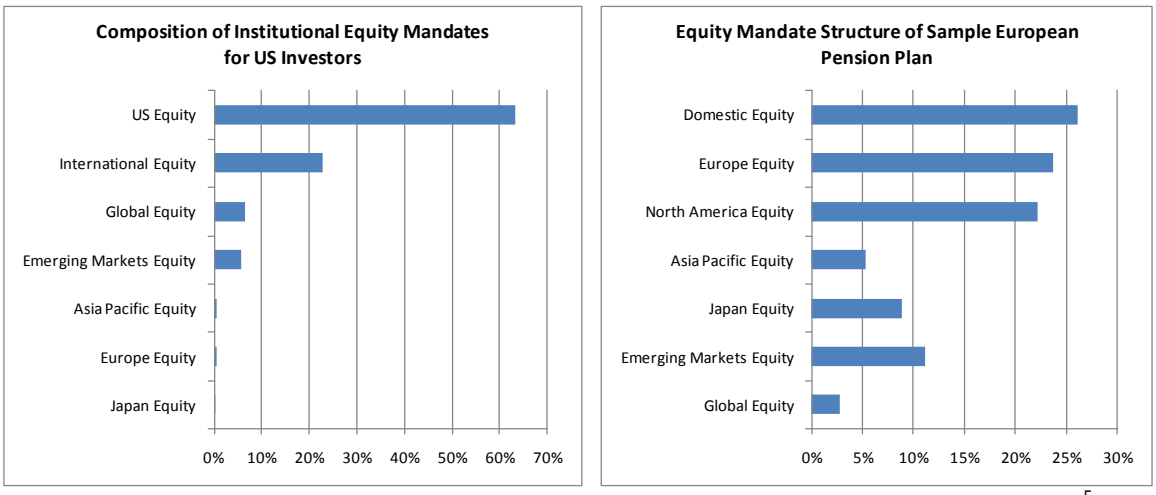
I. The Case for Global Equity Mandates[2]

Many institutional investors have chosen to adopt a global equity allocation. At the policy level, the investment opportunity set encompasses the global equity universe. Often, the policy allocation is represented by a global equity index, such as the MSCI All Country World Investable Market Index ("MSCI ACWI IMI"), that covers large, mid, and small cap companies in developed and emerging markets. However, the structure of mandates and the definition of the relevant opportunity set for individual mandates are critical decisions that require further consideration.

Institutional Trends toward Global Equity Markets

Traditionally, most investors viewed the global equity market as a set of geographic building blocks and defined the opportunity set of individual mandates accordingly. Exhibit 2 illustrates that US investors implemented their equity allocation using US and international mandates[3], while European investors often adopted a more fragmented mandate structure. One may question the investment rationale behind the different structures, given that the underlying global equity opportunity set is the same for all investors.

Exhibit 2: Traditional Equity Mandate Structure of US and European Investors



Source: eVestment Alliance[4], public websites of sample pension funds, MSCI. International equity mandates include the EAFE[5], EAFE Plus, and ACWI ex US mandates; global equity mandates include the World and ACWI mandates.

Under the traditional mandate structure, the focus of equity implementation has been to select skilled managers within relatively narrow building blocks, and allow the manager line-up to reflect the mandate structure. While investors can potentially benefit from managers' local/regional expertise, the downside

[2] Note that in this section and the rest of the paper, we have sometimes used US information in our analysis on the institutional equity market as well as the historical manager performance, due to the better availability of relevant US data.

[3] A similar practice is observed in Japan, where most of the equity mandates have traditionally been structured along domestic and non-domestic (Kokusai) portfolios.

[4] eVestment Alliance provides a database that covers a global sample of investment products, including more than 6,000 equity products.

[5] EAFE stands for Europe, Australasia, and Far East – i.e. all developed markets ex the US and Canada of the MSCI World country coverage.

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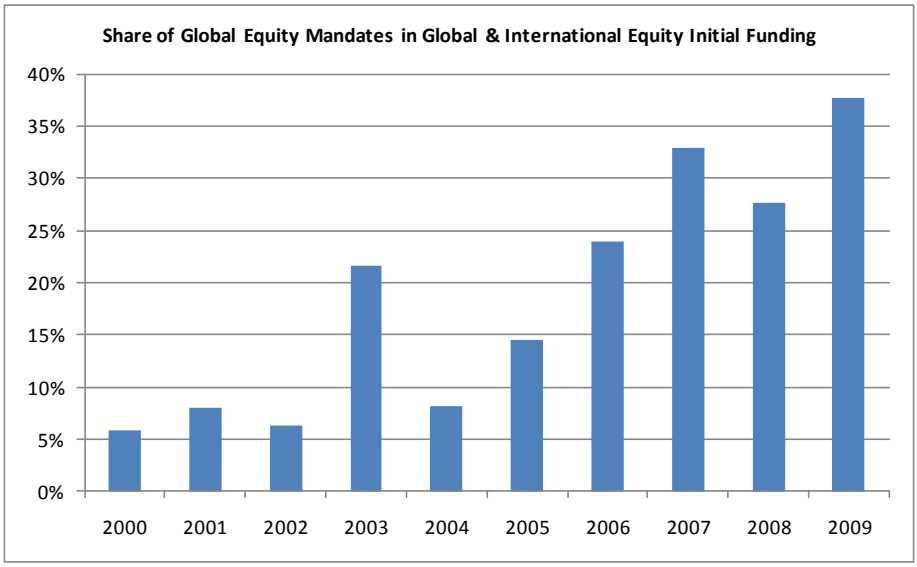
is that managers are limited to their segment and have to forgo investment opportunities within the broader equity universe.

With the globalization of equity markets, institutional investors increasingly realize that the partitioning of the investment opportunity set into domestic/international or regional blocks is becoming artificial. In comparison, global equity mandates give managers a higher degree of freedom in making investment decisions. For instance, managers can apply their sector expertise or insights to select the best stocks in global sectors, regardless of the domicile of the companies.

Many institutional investors and investment consultants have identified the move toward global mandates as a trend. Exhibit 3 shows the strong increase in the initial funding of global equity mandates: from a mere 6% in 2000, it has grown to represent 38% of all global and international equity initial funding in 2009[6].

Exhibit 3: Growth in Global Equity Mandate Initial Funding



Source: Intersec.

While many institutional investors have a certain degree of home bias in their equity allocation[7], it is important to note that such home bias does not necessarily prevent investors from adopting global equity allocation or global equity mandates. In fact, some pension plans have moved toward a global equity allocation by isolating the home bias into a separate domestic allocation, alongside a global allocation that no longer treats domestic and international equities as separate asset classes.

For instance, Exhibit 4 shows the equity allocation of a large US public pension plan. Alongside the market-cap weighted global equity allocation, it isolates the home bias into separate US large/small cap allocations, similar to its overweight in emerging markets[8]. Such a portfolio structure may enable

[6] As the growth in the initial funding of global equity mandates is a relatively recent trend, global equity mandates still represent a smaller proportion of total institutional equity assets compared to international mandates. See Exhibit 1, for instance.

[7] Subramanian, Nielsen, and Fachinotti (2009), Kang and Melas (2010), and Chia (2009) discussed the inherent risks of home-biased equity allocation in institutional portfolios and identified an increasing adoption of a global approach to equity allocation.

[8] Note that the adoption of a global equity allocation permits global mandates, but it does not necessarily lead to the adoption of a global mandate. For instance, some investors may use US and international mandates to implement a global equity allocation.

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investors to benefit from the merits of a global investment process and to manage home bias according to their specific investment objectives.

Exhibit 4: Global Equity Structure with Separate Domestic Mandates

Public Equity Asset Class	Benchmark	Target
Global Equity	MSCI All Country World Index	66%
US Large Cap	MSCI USA Large Cap Index	12%
US Small Cap	MSCI USA Small Cap Index	10%
Emerging Markets	MSCI Emerging Markets Index	12%

Source: A major US pension plan's public website.

Developed Market Equities as an Integrated Block

Proponents of a global investment process argue that developed market equities should be managed using global mandates. The global nature of economies and companies increasingly requires managers to value the companies versus their peers globally and to identify the best investment opportunities on a global basis.

In addition, it is well documented that global sectors/industries now play a very significant role in driving the cross-section of security returns in developed markets. Exhibit 5 confirms that, while country factors dominated industry factors in the late 1990s, industry factors have become equal or even more important drivers of developed market stock returns than country factors over the last decade. This highlights the increased importance of global sector allocation decisions relative to country allocation decisions in developed markets.

Fundamental style factors such as momentum, volatility, size, and value also represent important sources of global equity portfolio risk and return (Exhibit 5 shows the historical performance of the main fundamental factors). As illustrated in Exhibit 5, during certain periods of high systematic market risk (i.e., around the 2001 IT bubble and the recent financial crisis), style factors became so dominant that they explained about 40-60% of the cross-sectional stock return dispersion. The implication is that the decision to tilt the global equity portfolio toward certain fundamental styles can be critical to portfolio performance during certain periods of market turmoil.

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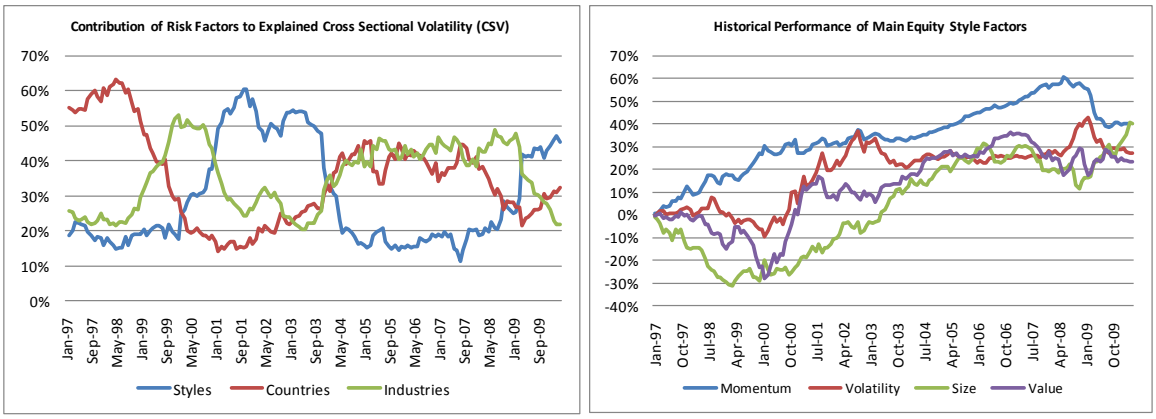
Exhibit 5: Importance of Global Sector and Style Factors in Developed Markets



Source: MSCI. The contribution of risk factors to explained Cross-Sectional Volatility (CSV) indicates the relative importance of the country, industry, and style factors in driving cross-sectional volatility. See the Appendix for technical details on CSV analysis. The performance of Momentum and Volatility represents the Momentum factor return and the inverted Volatility factor return from the Barra Global Equity Model (GEM2), respectively; the performance of the Size factor is the performance of the MSCI World Small Cap Index relative to the MSCI World Large Cap Index; the performance of the Value factor is the performance of the MSCI World Value Index relative to the MSCI World Growth Index.

While domestic/international or regional mandates enable investors to implement their allocation decisions along such lines, they cannot effectively accommodate global sector and style exposure targets, which recently have dominated the performance of developed market equity portfolios. For instance, allocating investments across a number of regional mandates may make it difficult for plan sponsors to implement strategic sector positions or to manage effectively the portfolio's style exposures. The aggregated global sector/style exposure may become byproducts of the often "bottom-up" investment processes of individual regional mandates, resulting in unintended bets on global sectors or styles.

In comparison, global mandates enable plan sponsors and managers more effectively to implement and monitor strategic or tactical positions in global sectors and styles. Plan sponsors may set explicit sector and style policies on global mandates, in addition to regional exposure guidelines, and may permit managers to tactically deviate from these policies/guidelines within certain active limits. For instance, a plan sponsor who wants strategically to overweight the Energy and Materials sectors can more effectively implement and monitor such positions in global mandates instead of multiple regional mandates.

The higher degree of freedom for managers to pick stocks globally and manage global sector and style exposures offers more potential to add value. Exhibit 6 shows that the top quartile active global managers (benchmarked to MSCI World) have indeed outperformed the top quartile US and EAFE managers over the last 5 and 10 years.

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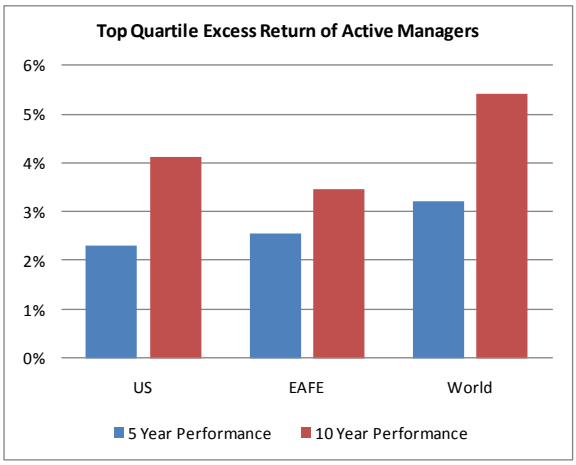
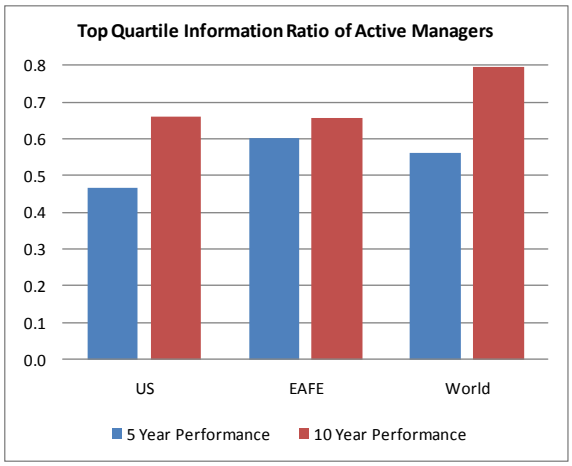
Exhibit 6: Historical Performance of Top Quartile US, EAFE, and World Mandates[9]





Source: MSCI, eVestment Alliance. Data as of March 2010. The performance analysis is before adjustments for selection bias, survival bias, and management fees. Excess return is the active return relative to the benchmark. EAFE stands for Europe, Australasia, and Far East – i.e. all developed markets ex the US and Canada of the MSCI World country coverage. Past performance is not indicative of future results.

The Breadth of Equity Mandates

Though institutional investors seem to agree that the large/mid cap segment of developed market equities may be managed globally, there is less consensus as to whether global mandates should also cover emerging markets and small caps. Exhibit 7 shows that the majority of global equity products targets only developed markets, and there are also a significant number of dedicated emerging market mandates. While there is a deep pool of US small cap products, the number of international, global, and emerging market small cap products is limited.

Exhibit 7: Number of Equity Products with a Significant Asset Base

Segment	# Products	Segment	# Products
US Mandates		**Emerging Markets Mandates**	
US Large/Mid/All Cap	1420	Emerging Markets	151
US Small Cap	568	Emerging Markets Small Cap	7
International Mandates		**Global Mandates**	
EAFE / World ex US	272	World	184
ACWI ex US	68	ACWI	52
International Small Cap	50	Global Small Cap	12

Source: MSCI, eVestment Alliance. Data as of March 2010. The performance analysis is before adjustments for selection bias, survival bias, and management fees. Excess return is the active return relative to the benchmark. EAFE stands for Europe, Australasia, and Far East – i.e. all developed markets ex the US and Canada of the MSCI World country coverage. Past performance is not indicative of future results.

Over the last few years, investors started to allocate investments to global mandates that target both developed and emerging markets (MSCI ACWI). More recently, some investors have given out even broader mandates targeting the whole global equity universe (MSCI ACWI IMI)[10].

[9] The historical performance data of managers is sourced from eVestment Alliance. Note that manager performance databases may be subject to potential biases such as selection bias, survivorship bias.

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While this may indicate an institutional trend to move toward broader and more global mandates, it does not imply that targeting all segments of the global equity universe in one global mandate is the preferred structure.

Instead, when deciding the coverage of equity mandates, careful consideration may be given to the characteristics of various market segments. For instance, investors may examine whether different market segments are driven by different risk and return factors, and whether they require different investment processes. In addition, the choice of mandate structure may have significant implications for manager selection. For instance, Exhibit 7 indicates that investors who implement global equity allocation through developed market and dedicated emerging market mandates face a deeper manager pool than investors who allocate to ACWI mandates.

In addition, only managers with global research and portfolio management capacity can capitalize on the increased breadth of the broader opportunity set[11]. Exhibit 8 shows that the global equity universe (measured by MSCI ACWI IMI) includes more than eight thousand securities across developed and emerging markets, as well as large, mid, and small cap segments.

Exhibit 8: Coverage and Composition of the Global Equity Universe

	No. of Securities			Weight in ACWI IMI		
	Large/Mid Cap	Small Cap	All Cap	Large/Mid Cap	Small Cap	All Cap
Develope Markets: MSCI World IMI	1659	4517	6176	75.4%	11.4%	86.8%
Emerging Markets: MSCI EM IMI	756	1892	2648	11.5%	1.7%	13.2%
All Country World: MSCI ACWI IMI	2415	6409	8824	86.9%	13.1%	100.0%

Source: MSCI. Data as of 2 August 2010.

II. Implementing Emerging Market Equities

Institutional investors generally use two different approaches to introduce emerging market exposures. The first is through broad international or global mandates that include emerging markets (such as ACWI ex US or ACWI mandates). The second is through dedicated emerging market mandates.

Some investors prefer dedicated emerging market mandates as a way to implement a certain level of strategic exposure to this segment. For instance, a strategic overweight in emerging markets can be implemented using dedicated emerging market mandates. In comparison, the emerging market exposure in international/global mandates may vary across different managers and over time.

Most emerging markets differ from developed markets in the level of economic development and market accessibility[12]. More important, many investors consider emerging markets to have different risk and return drivers from developed markets. Such characteristics may suggest that emerging markets

[10] See Intersec (2009).

[11] Per the Fundamental Law of Active Management (Grinold and Kahn, 1999), the manager's information ratio depends not only on the breadth (the number of independent forecasts that the manager can make), but also on the information coefficient (the quality of the forecasts). Broader global mandates certainly give managers increased breadth, but only managers with truly global capacity can maintain a sufficiently high information coefficient to benefit from the increased breadth. Thorley, Clarke, and Silva (2002) discuss the role of constraints, as active portfolio management typically is conducted within constraints that do not permit managers to exploit fully their ability to forecast returns.

[12] For instance, the MSCI Market Classification Framework uses three criteria to classify countries in either developed, emerging, or frontier markets: economic development, size and liquidity, and market accessibility.

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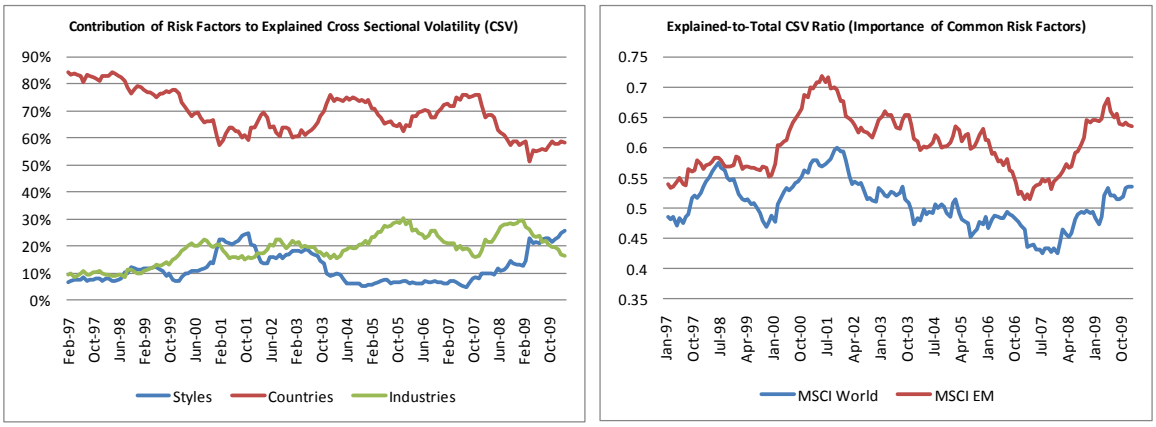
require a different investment process, and investors may value the emerging market managers' specialization and track record.

While institutional investors increasingly view developed markets as an integrated block driven by global risk factors, emerging markets continue to represent a heterogeneous investment universe with countries at different stages of economic and equity market development. Local factors such as economic, political, and regulatory risks are often dominant drivers in emerging market equities.

Exhibit 9: Risk and Return Drivers in Emerging Markets



Source: MSCI. The contribution of risk factors to explained Cross-Sectional Volatility (CSV) indicates the relative importance of the country, industry, and style factors in driving cross-sectional volatility. The explained-to-total CSV ratio indicates the importance of common risk factors (as opposed to stock specific risks) in driving cross-sectional volatility: a higher ratio indicates a higher importance of common factors. See the Appendix for technical details on CSV analysis.

Exhibit 9 confirms that country factors in emerging markets are still more important return drivers than industry and style factors. This is in stark contrast to developed markets, in which global industry and style factors dominate. The implication is that, while global sector allocation and style exposures are important for developed markets, country allocation and local expertise may be more important skills for managing emerging market mandates.

Exhibit 9 also illustrates that the explained-to-total Cross-Sectional Volatility (CSV) ratio of emerging markets has been higher than for developed markets. This ratio indicates the importance of common risk factors, as opposed to company-specific risks. It implies that a top-down investment process that focuses on systematic factors is more important for emerging markets[13].

The importance of a top-down investment process with a focus on country allocation implies that emerging market managers may have more potential to add value in a global emerging market mandate, as opposed to regional/country emerging market mandates. Exhibit 10 confirms that the vast majority of emerging market mandates (94.5% by AUM) are global mandates. In contrast, investors who choose regional emerging market mandates would likely need the skills to make their own country allocation decisions and allocate their mandates accordingly.

[13] Morck, Yeung, and Yu (2000) suggest that one explanation could be that emerging markets, compared with developed markets, are more efficient in incorporating marketwide information (systematic factors) and less efficient in reflecting private information (idiosyncratic factors).

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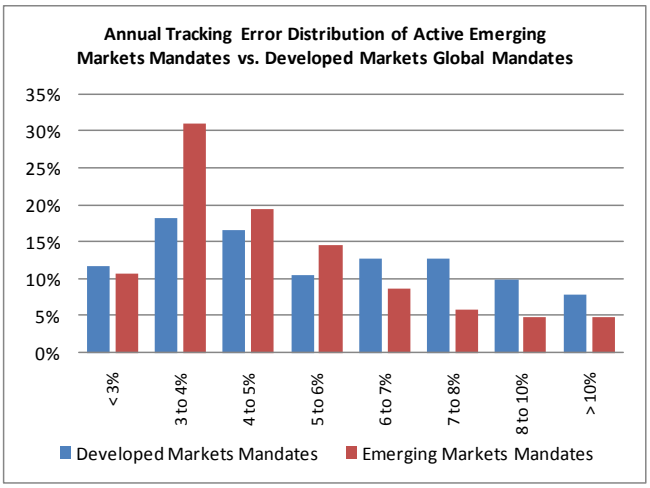
Exhibit 10 also shows that emerging market mandates typically target core exposures instead of value/growth styles, which is consistent with the finding that style factors play a less important role in emerging markets. Another observation is that all-cap mandates already represent 14.3% of emerging market mandates. This is a recent development and indication that investors opt for all-cap mandates to get the deeper exposure to emerging markets.

Exhibit 10: Characteristics and Tracking Error Distribution of Emerging Market Mandates

Characteristics of Emerging Markets Mandates	% by AUM
Geographic Region	
Diversified Emerging Markets	94.5%
Regional/Country	5.5%
Primary Style	
Core	87.5%
Value	7.3%
Growth	5.2%
Capitalization	
Large/Mid Cap	85.1%
All Cap	14.3%
Small Cap	0.6%



Source: MSCI, eVestment Alliance. The geographic/style/capitalization distribution is calculated based on the benchmarks of the emerging market mandates. The data is as of March 2010.

In addition, Exhibit 10 shows that the majority (61%) of emerging market mandates have a modest tracking error of below 5%, compared to 46% of developed market mandates. This is somewhat surprising, as one might expect the tracking error of emerging markets to be higher than that of developed market mandates, given that emerging markets have been more volatile than developed markets. This observation may confirm that many emerging market mandates are structured to get the diversified beta exposure to the segment.

III. Implementing Small Cap Allocation

Investors can implement small cap allocation either through all-cap or specialist small cap mandates. Currently, very few investors allocate money to dedicated emerging market small cap managers. Exhibit 10 shows that small cap products represent only 0.6% of emerging market mandates.

However, in developed markets, there is a much deeper pool of specialist small cap managers. While using all-cap mandates reduces the number of mandates, specialist small cap mandates are often considered one way to introduce a more systematic exposure to the small cap segment.

In addition, investors who prefer specialist small cap mandates typically consider small cap as a different segment from large and mid cap. For instance, the small cap segment is often considered less efficient, due to the relatively poor information flow compared with the large cap segment. The relatively illiquid nature of small cap stocks also makes capacity constraint an important consideration when constructing small cap portfolios or selecting small cap managers. In addition, there is a higher degree of manager selection risk than in the large/mid cap segment, due to the higher return dispersion of small cap managers.

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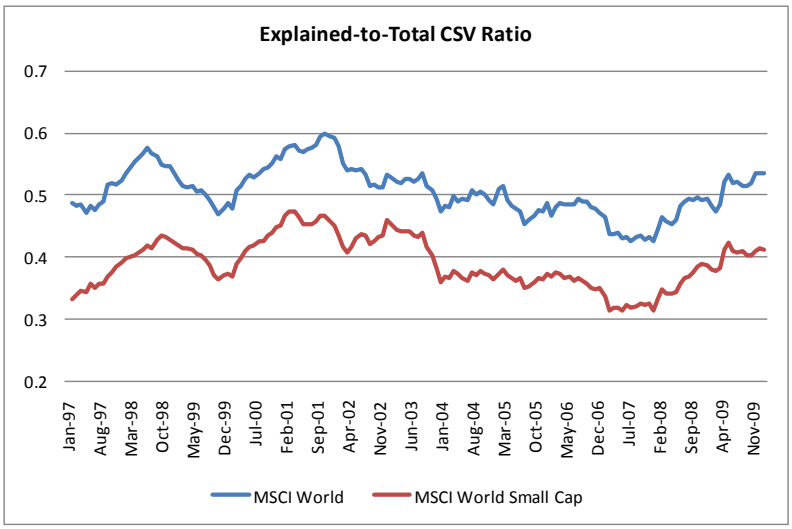
While large cap stocks tend to be driven more by systematic risk factors (global industry, style, and country factors), small cap stocks are more heavily affected by company-specific characteristics. Exhibit 11 confirms that systematic risk factors explain a smaller proportion of the cross-sectional volatility in small cap stocks compared to large/mid cap stocks. An investment implication is that a bottom-up stock-picking investment process may be critical for actively managed small cap portfolios. Another implication is that separate small cap mandates, compared to all-cap mandates, may give investors more flexibility in using both passive and active investment approaches. For instance, some investors tend to employ more passive mandates for the large/mid cap segment, while using active management for the small cap segment.

Exhibit 11: Higher Company-Specific Risks in Small Cap Segment



Source: MSCI. The explained-to-total CSV ratio indicates the importance of common risk factors (as opposed to stock-specific risks) in driving cross-sectional volatility: a higher ratio indicates a higher importance of common factors. See the Appendix for technical details on CSV analysis.

Due to the higher company-specific risks and the less global nature of small cap companies, some investors may opt for regional mandates to benefit from a manager's stock-picking skills and local knowledge. Indeed, some investors consider global small cap to be a relatively difficult mandate to execute successfully, given the challenge for a manager to possess a significant amount of local company specific knowledge spread over a vast number of small cap stocks across countries and regions.

Manager Selection Risk

The performance dispersion of individual small cap managers has been higher than for large cap managers, and it represents both a challenge and an opportunity for plan sponsors who aim to select top managers. As the small cap universe contains thousands of relatively small stocks with high company-specific risks, individual small cap managers can hold portfolios of different risk profiles, which can result in higher manager return dispersion. Small cap managers also tend to incur higher tracking errors relative to the benchmark.

Exhibit 12 illustrates that the tracking error distribution of US small cap managers is significantly skewed to the right (i.e., higher tracking error) compared to US large/mid cap managers. It also shows the distribution of managers' excess return relative to the median performance of the peer group. A larger proportion of large/mid cap managers delivered similar performance to their median peer, compared to

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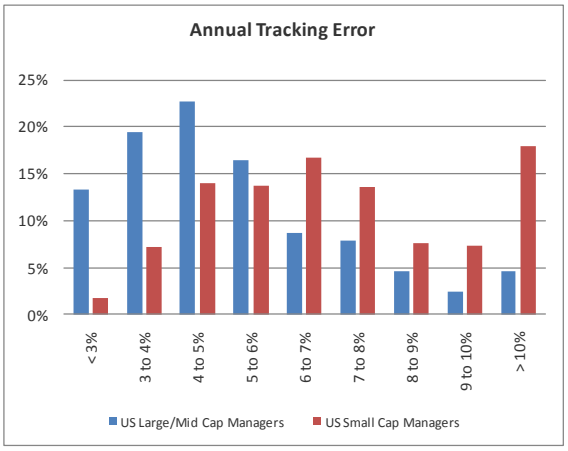
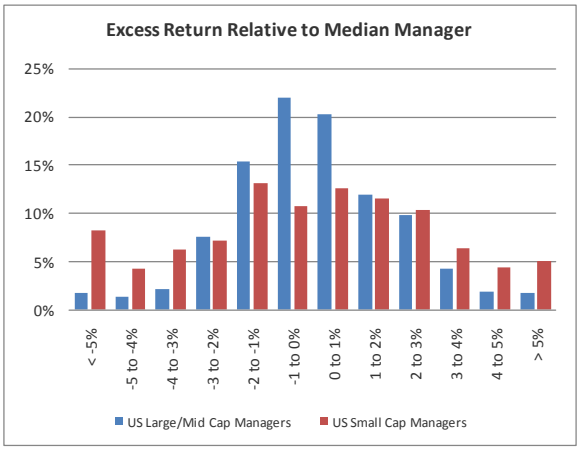
small cap managers. More notably, the excess return distribution of small cap managers has a fatter left tail: about 19% of small cap managers underperformed their median peer by more than 3%, while merely 5% of large/mid cap managers delivered such underperformance.

Exhibit 12: Tracking Error and Return Dispersion of US Large/Mid Cap vs. Small Cap Managers





Source: MSCI, eVestment Alliance. 5 Years to March 2010.

The higher tracking error and return dispersion of small cap managers imply a higher manager selection risk. One approach that is used often by pension plans to diversify the manager selection risk is to adopt multiple mandates in each market segment. While multiple small cap mandates mitigate the manager selection risk, it requires resources to select and monitor multiple managers.

Capacity Constraint Considerations

Another challenge in managing small cap portfolios is the capacity constraint caused by the relatively illiquid nature of this segment. Zeiler and Allen (2004) discuss the capacity constraint of small cap managers and suggest that most managers estimate the capacity for a product to be somewhere between USD1 and USD3 billion. Capacity constraint arises when limited stock liquidity narrows down the universe of small cap stocks about which managers can implement a strong view within a short time. We can obtain a more intuitive picture of the capacity constraint of small cap products by examining a numerical example.

Exhibit 13 examines the proportion of small cap stocks that may pose a liquidity challenge in different segments of the small cap universe, and it illustrates how the liquidity challenge rises with portfolio size. We imagine a case in which a manager wants to implement a strong view on a stock by either establishing or liquidating a 1% position of a small cap portfolio on this stock. If it takes more than 10 trading days to implement such position without exceeding 20% of the average daily trading volume on each day, a stock is considered to have a potential liquidity issue. Exhibit 13 shows that, for a USD1 billion US small cap product, 78% of stocks (represent 49.6% of the market capitalization of the universe) in the US small cap universe may have such a potential liquidity issue. Not surprisingly, the proportion of international and emerging markets small cap stocks that may face such liquidity challenges is even more significant. Another observation is that the liquidity challenge rises quickly when the portfolio size rises from USD500 million to USD2 billion.

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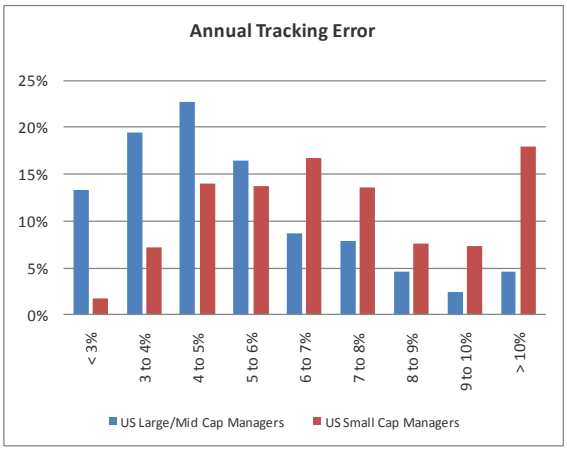
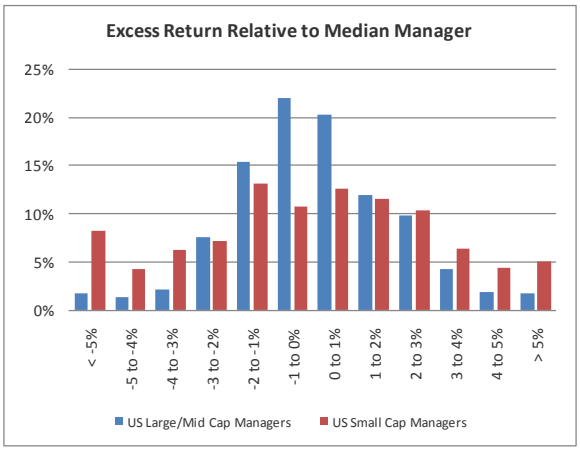
Exhibit 13: Capacity Constraint Illustration — Proportion of Small Cap Stocks with Potential Liquidity Issue under Different Portfolio Sizes





Source: MSCI. Data as of July 2010.

One way to mitigate the capacity constraint in small caps is to increase the number of holdings. For instance, for a USD1 billion portfolio, holding 200 stocks instead of 100 stocks would reduce the average position from USD10 million to USD5 million, significantly mitigating the liquidity challenges. Exhibit 14 shows that the median US small cap mandates hold about 100 stocks across different AUM categories. Interestingly, the median international small cap mandates hold 190 stocks, which may partly reflect more significant liquidity challenges in the international small cap segment.

Exhibit 14: AUM & Holdings Statistics of Small Cap Products with a Significant Asset Base (above USD250M AUM)

US Small Cap Mandates

AUM Category	% of AUM	Median No. of Holdings
250 - 500M	27.5%	88
500M - 1Bn	34.0%	95
1 - 2 Bn	21.7%	100
> 2Bn	16.8%	107
All Mandates	**100%**	**99**

International Small Cap Mandates

AUM Category	% of AUM	Median No. of Holdings
250 - 500M	34.7%	119
500M - 1Bn	16.3%	126
1 - 2 Bn	24.5%	261
> 2Bn	24.5%	243
All Mandates	**100%**	**190**

Source: MSCI. Data as of July 2010.

These observations highlight that the portfolio size, number of stock holdings, and small cap segment (US vs. international or emerging markets) all affect the liquidity challenges a small cap product may face, and thus they should be taken into account when evaluating the capacity of the small cap allocation. One implication may be that investors who have a sizable small cap allocation may need to assign multiple small cap mandates to mitigate the potential challenges of capacity constraint.

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IV Conclusions and Future Research

Traditionally, institutional investors partitioned the global investment opportunity set to geographic building blocks. As a result of the continued evolution of global equity markets, institutional investors are increasingly adopting a more integrated global equity investment processes.

Our research suggests that global equity mandates, together with dedicated emerging market mandates and small cap mandates, may be emerging as the "new classic" structure for implementing equity allocation. Investors who need to maintain a home bias can manage the domestic portfolio separately. Such a more top-down mandate structure not only accrues benefits from the potential merits of an integrated global investment process, but it also accommodates segment-specific considerations on manager selection, legacy or mandatory home bias in equity allocation, and different risk and return drivers and investment processes in various equity market segments.

We intentionally avoided a discussion on active vs. passive implementation of the global equity allocation, as that question is part of our ongoing research efforts and will be addressed in an upcoming research paper.

We plan to explore further other recent equity allocation trends. For instance, some investors implement an equity allocation using a passive core portfolio with active decisions implemented through overlays; and some pension plans consider capturing the risk premia associated with various equity risk factors in a systematic fashion through factor-based asset allocation. We will examine alternative approaches for implementing an equity allocation in a separate research paper.

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Appendix: Cross-Sectional Volatility Analysis

Cross-sectional volatility (CSV) measures the dispersion of stock returns over a period and is a gauge of the opportunity for active portfolio management. The CSV analysis in this paper is based on a monthly calculation and smoothed using a 12-month rolling average. The Barra Global Equity Model, GEM2 (see Menchero, Morozov, and Shepard 2008), is used to examine the drivers of cross-sectional volatility. The equity factor set in GEM2 includes a World factor (w), countries (c), industries (i), and styles (s). The excess return of stock n is expressed as:

$$r_n = f_{common(n)} + u_n = f_w + \sum_c X_{nc} f_c + \sum_i X_{ni} f_i + \sum_s X_{ns} f_s + u_n \ ,$$

where f_{common} is the return that can be attributed to common factors (World, countries, industries, and styles), and u_n is the stock specific return not explained by the common factors. For convenience, we denote $f_{country(n)} = \sum_c X_{nc} f_c$, $f_{industry(n)} = \sum_i X_{ni} f_i$, and $f_{style(n)} = \sum_s X_{ns} f_s$,

For each month, the Total CSV can be calculated as:

$$\sigma(r) = \sqrt{\sum_n w_n \left(r_n - \bar{r}\right)^2} \ ,$$

where w_n is the market-cap weight of stock n, and $\bar{r}$ is the average return of all stocks. The cross-sectional variance is the square of CSV, $\sigma^2(r)$.

The Total CSV can be decomposed into Explained CSV and Specific CSV, where Explained CSV can be calculated similarly as:

$$\sigma\left(f_{common}\right) = \sqrt{\sum_n w_n \left(f_{common(n)} - \bar{f}_{common}\right)^2} \ ,$$

The ratio of Explained CSV to Total CSV indicates the importance of common factors in driving total cross-sectional volatility, and it can be calculated as[14]:

$$\text{Explained-to-Total CSV Ratio} = \sigma\left(f_{common}\right) / \sigma(r) \ .$$

As Explained CSV is driven by country, industry, and style factors[15], we can infer the relative importance of country, industry, and style factors by examining the relative magnitude of their contribution to cross-sectional variance:

$$\text{Contribution of Countries} = \sigma^2\left(f_{country}\right) / \left(\sigma^2\left(f_{country}\right) + \sigma^2\left(f_{industry}\right) + \sigma^2\left(f_{style}\right)\right),$$

$$\text{Contribution of Industries} = \sigma^2\left(f_{industry}\right) / \left(\sigma^2\left(f_{country}\right) + \sigma^2\left(f_{industry}\right) + \sigma^2\left(f_{style}\right)\right),$$

$$\text{Contribution of Styles} = \sigma^2\left(f_{style}\right) / \left(\sigma^2\left(f_{country}\right) + \sigma^2\left(f_{industry}\right) + \sigma^2\left(f_{style}\right)\right).$$

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[14] Note that the square of Explained-to-Total CSV Ratio is the Relative R-Squared.

[15] The World factor does not affect CSV, as every stock has the same exposure of 1 to this factor.

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