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# Economic Exposure in Global Investing

Tilting Portfolios Based on Macroeconomic Views

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## Executive Summary

Market capitalization-based indexes classify companies based on their country or region of domicile. This approach, however, does not reflect the sources of a constituent's revenues, which have become more global in nature. How should investors adjust to this increased globalization and what opportunities does it present?

At a policy benchmark level, this growing shift raises a critical question: Should investors shift to benchmarks based on economic exposure instead of market capitalization? The answer, we believe, is clearly no. A policy level benchmark should represent the global opportunity set and be market capitalization-weighted (as in the case of MSCI ACWI IMI). However, at the strategic or mandate level, institutional investors may choose to depart from market-cap weighting, both in how they design mandates and how they measure their performance.

In this paper, we highlight the disparity between the geographic revenue exposures of flagship MSCI regional indexes relative to their market capitalization weights. Our analysis shows that the performance of companies is sensitive to that of the economies to which they are exposed. The economic exposure of companies can be a meaningful descriptor for characterizing the macro-factor risks of stocks. After controlling for the market, industry and style factors in a multivariate regression framework, the economic exposure factor has historically yielded a positive and significant return for the U.S. market.

Investors can use these insights in a variety of ways:

- Active managers can use economic exposure-based insights in equity allocation. For example, they can tilt portfolios towards regions with higher projected growth and away from those facing political and macroeconomic uncertainty.
- Active managers can also achieve global diversification by creating a portfolio of companies with diversified regional revenue exposure — a significant departure from traditional diversification in stocks based on their country of domicile.
- Investors can shift their exposures by using an economic exposure index-based fund to complement their existing passive portfolio.
- Asset owners can use economic exposure data to understand their equity exposure to various markets at the total portfolio level as well as to understand how the global equity opportunity set can be dissected into new baskets of stocks based on economic exposure.

In summary, economic exposure provides an alternative approach to characterize a company's country and regional exposures. Economic exposure indexes can be used by asset managers to implement their macroeconomic views, form the basis for security selection, and may serve as useful tools for global investors in portfolio construction, asset allocation and passive product creation.

# Introduction

Market capitalization-based indexes classify companies based on their country or region of domicile. This approach, however, does not reflect the sources of a constituent's revenues. For example, as of June 30, 2014, emerging markets stocks within the MSCI ACWI Index comprised 11% of the index by cap weight but accounted for nearly 35% of global revenues. In contrast, U.S. stocks comprised 49% of the MSCI ACWI Index by cap weight but contributed only 28% of global revenues.

Globalization has made this disparity more apparent over time. For investors, this phenomenon raises an intriguing issue: Should investors shift to benchmarks based on economic exposure instead of market capitalization? At the policy level, the answer, we believe, is clearly no. The market capitalization-based benchmark reflects the complete investable opportunity set and is macro consistent. If investors deviate from the market-cap policy benchmark, the implication is that they are making an active bet.

However, at the strategic or mandate level, institutional investors may consciously choose to depart from the global opportunity set, both in how they establish specific portfolios and how they measure their performance. In this case, they may instead choose to select indexes where constituents are weighted based on the source of their revenues, such as the MSCI Economic Exposure Indexes. These indexes may serve as meaningful benchmarks as well as the basis for a portfolio.

Economic exposure presents an alternative and indirect way of gaining access to specific regions. This approach is particularly useful for investors who have constraints on direct investing abroad. But global investors can also use this tool: They can implement macroeconomic views and themes by gearing a portfolio's economic exposure towards (or away from) target regions or countries through the use of funds tracking the MSCI Economic Exposure Indexes.<sup>1</sup> Also, examining constituent companies based on the regional profile of their revenues provides important insights for global and even purely domestic investors.

This paper explores new dimensions in global investing and may interest:

- Investors who can shift their exposures by using an economic exposure index-based fund to complement their existing passive portfolio.
- Asset owners who wish to understand how the global equity opportunity set can be dissected into new baskets of stocks based on economic exposure.
- Asset managers with both long-term and short-term macroeconomic views on the performance of specific countries and regions.
- Risk managers who wish to understand the country and regional exposure of their portfolios through the lens of economic exposure.

The rest of the paper is organized in the following sections. Section I presents information on the economic exposures of global as well as regional benchmarks. Section II highlights global companies' exposure to country and regional risks, which imply that their stock returns are sensitive to economic activity in those regions. Section III underscores the importance of global mandate structures and highlights the potential role of economic exposure indexes alongside global policy benchmarks. The last section sets out conclusions.

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<sup>1</sup> More information on the indexes, including descriptions of the methodology, related research papers, ticker codes and other data can be found at [http://www.msci.com/products/indexes/thematic/economic\\_exposure/](http://www.msci.com/products/indexes/thematic/economic_exposure/)

# I. Economic Exposure of Global Equity Benchmarks

As companies operate across several countries and regions, their revenues are exposed to economic activity beyond their home country. As of June 30, 2014, Samsung Electronics Co., domiciled in Korea, derived 90% of its revenues outside Korea and close to 50% outside emerging markets (EM). Yum Brands, a consumer discretionary company headquartered in the United States, generated 53% of its revenues from China and only 22% from the United States. In fact, within the MSCI ACWI Index, a global equity index consisting of developed and emerging market companies, 25% of constituents by market cap drew at least 75% of their revenues from international markets.

Exhibit 1 contrasts the benchmark weights and revenue exposures of the MSCI ACWI Index. Emerging markets, 11% by cap weight of the MSCI ACWI Index, contributed nearly 35% of global revenues. Similarly, the United States made up 49% of MSCI ACWI by cap weight but contributed only 28% of global revenues. Even where weights are consistent in terms of market cap and revenue, such as in Europe Ex-UK, the underlying baskets of stocks can vary.

*Exhibit 1: Market Cap vs. Revenue Exposure of MSCI ACWI Index*



Data as of June 30, 2014

The revenue exposure to emerging markets also includes the frontier markets and other countries

Exhibit 2 reveals that a number of MSCI regional indexes offer substantial foreign exposure. For example, the MSCI North America Index drew 69% of its revenues from domestic operations, 11% from Europe and 16% from emerging markets. Strikingly, the MSCI Europe Index derived only 50% of its revenue from the European economy.<sup>2</sup>

<sup>2</sup> See "How European is Europe?" MSCI Research Bulletin. (February 2013), <http://www.msci.com/resources/research/articles/2012/Economic-Exposure-How-European-Is-Europe.pdf>

Exhibit 2: Geographic Distribution of Revenues of Various MSCI Regional Benchmarks

MSCI Indexes	North America		Europe		Pacific		EM	
	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure
MSCI North America	100%	69%	0%	11%	0%	4%	0%	16%
MSCI Europe	0%	18%	100%	50%	0%	5%	0%	27%
MSCI Pacific	0%	11%	0%	5%	100%	66%	0%	18%
MSCI EAFE	0%	15%	68%	35%	32%	25%	0%	24%
MSCI World	59%	38%	28%	25%	13%	16%	0%	21%
MSCI EM	0%	7%	0%	7%	0%	3%	100%	82%
MSCI ACWI	53%	31%	25%	21%	12%	13%	11%	35%

\* Data as of June 30, 2014

\*\* The revenue exposure to emerging markets also includes the frontier markets and other countries. The revenue exposures reported are the revenue weights of the benchmarks, independent of benchmark weights

The difference between cap weights and revenue exposure is apparent even at the sector level. Exhibit 3 shows the economic exposure of the constituents of the MSCI World Index by sector, as of June 30, 2014. For example, within the MSCI World Energy Index, North American companies made up 71% weighted by market capitalization but accounted for only 39% of total revenues. The MSCI World Energy Index meanwhile had a revenue exposure of 22% to EM. Across sectors, Materials, Information Technology and Industrials had larger EM exposures than more domestically oriented sectors such as Utilities, Telecom, Health Care and Financials.

Exhibit 3: Market Cap vs Revenue Exposure across MSCI World Sector Indexes

MSCI World Sector Indexes	North America		Europe		Pacific		EM	
	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure	Market Cap Weight	Revenue Exposure
Energy	71%	39%	27%	29%	3%	10%	0%	22%
Materials	43%	25%	39%	23%	19%	18%	0%	35%
Industrials	54%	32%	28%	23%	19%	22%	0%	24%
Consumer Discretionary	59%	43%	24%	20%	17%	14%	0%	23%
Consumer Staples	53%	44%	38%	21%	9%	13%	0%	22%
Health Care	63%	64%	31%	13%	6%	10%	0%	13%
Financials	50%	37%	29%	30%	21%	18%	0%	15%
Information Technology	85%	33%	7%	18%	8%	19%	0%	30%
Telecommunication Services	42%	34%	39%	29%	19%	25%	0%	13%
Utilities	53%	26%	36%	48%	12%	17%	0%	8%

\* Data as of June 30, 2014

\*\* The revenue exposure to emerging markets also includes the frontier markets and other countries. The revenue exposures reported are the revenue weights of the benchmarks, independent of benchmark weights

The contrasting benchmark weights and revenue exposure profiles underscore the importance of understanding the implicit foreign exposure of typical benchmarks when performing security analysis and portfolio construction.<sup>3</sup> In subsequent sections of this paper, we will discuss how investors can exploit these opportunities, depending on their views, using funds tracking the MSCI Economic Exposure Indexes.

<sup>3</sup> More insights on economic exposure can be found in "Economic Exposure to Emerging Markets" [http://www.msci.com/resources/research/articles/2012/Economic\\_Exposure\\_to\\_EM\\_24\\_May\\_2012.pdf](http://www.msci.com/resources/research/articles/2012/Economic_Exposure_to_EM_24_May_2012.pdf); "Are Small Caps Truly Domestic?" [http://www.msci.com/resources/research/articles/2013/Are\\_Small\\_Caps\\_Truly\\_Domestic.pdf](http://www.msci.com/resources/research/articles/2013/Are_Small_Caps_Truly_Domestic.pdf)

## II. Economic Exposure and Stock Sensitivity to Country / Region Risks

A company’s exposure to country and regional risks is a function of a number of variables including where its revenues originate, the location of its production facilities, its supply chain linkages, and the extent to which it employs risk management tools such as hedging. Given issues of data availability and the need to maintain a consistent measure of economic exposure across a global set of companies, MSCI uses the revenue exposure of firms as a proxy for economic exposure.

With the advent of globalization and an interconnected system of economic and financial markets across developed and developing countries, understanding the macroeconomic landscape is increasingly important. Rapid changes in the relative economic growth rates of countries around the world suggest that a company’s economic exposure is likely to be relevant in forecasting its future cash flows, associated risks, valuations and stock performance.

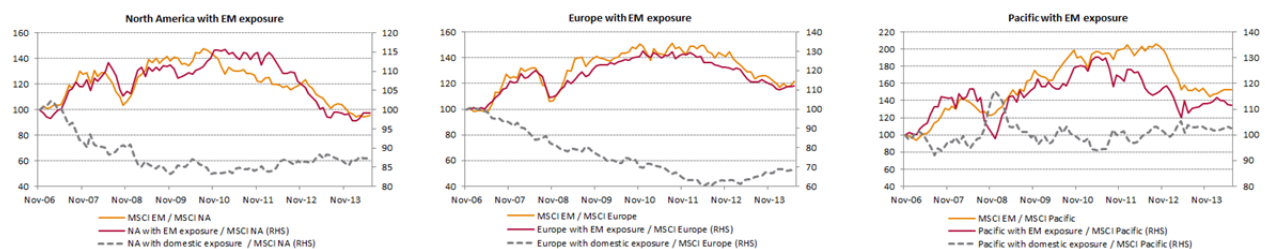
Several research studies also show that the exposures of global companies to country and regional risks are a critical component of their valuations (Damodaran, 2003) and are key risk factors driving stock performance (Li, Richardson, Tuna, 2014). Recent studies investigating the effect of international diversification on firm value for U.S. multinational corporations have found evidence of statistically and economically significant premia (Creal, Robinson et al., 2014).

### International Exposure and Macro Sensitivity of Stocks

Companies have risk exposure to the countries and regions from which they derive revenues. In this section, we present empirical evidence that underscores the importance of a company’s economic exposure to different countries as a macro driver of its stock performance.

Exhibit 4 shows the relative performance of various MSCI indexes as well as the correlations between them. The performance of North American, European and Pacific companies with high EM exposure historically experienced high correlation with emerging markets performance, as can be seen in the cells highlighted in green in the table below. Domestically oriented firms, in contrast, had a lower correlation with emerging markets, as can be seen in the cells highlighted in yellow.

Exhibit 4: EM Exposure: Relative performance and historical correlations (November 2006 – June 2014)



Indexes were simulated. The charts show relative index levels in local currency.

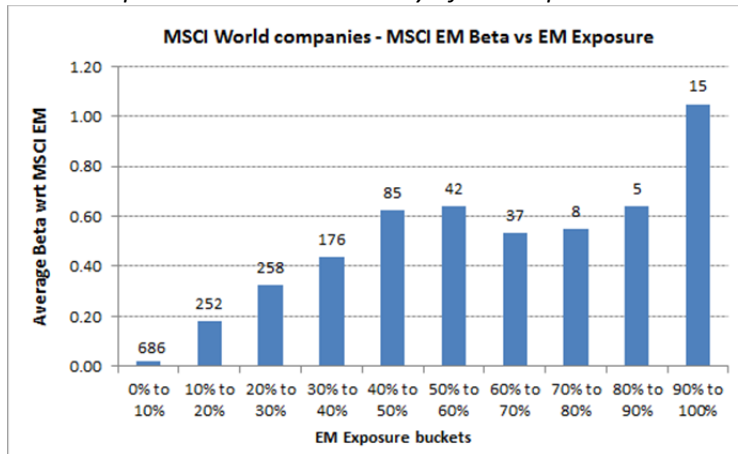
Correlations	NA with EM exposure / MSCI NA	NA with domestic exposure / MSCI NA	Europe with EM exposure / MSCI Europe	Europe with domestic exposure / MSCI Europe	Pacific with EM exposure / MSCI Pacific	Pacific with domestic exposure / MSCI Pacific
MSCI EM / MSCI NA	0.51	-0.47				
MSCI EM / MSCI Europe			0.63	-0.30		
MSCI EM / MSCI Pacific					0.52	-0.32

\* Correlations between gross local returns for period November 30, 2006 to June 30, 2014  
 NA = North America; EM = Emerging Markets

The cross-sectional differences in sensitivities of companies to regions can also be highlighted by stratifying stocks based on their regional economic exposure and their linkages with regional betas. As an illustrative example, we stratify stocks in the MSCI World Index based on their economic exposure to emerging markets as the target region. We then regress the returns of each company in the MSCI World Index with both the World domestic returns (X1) and the excess returns of EM domestic over World domestic (X2).<sup>4</sup> The use of domestic indexes ensures that the independent variables in the regression model (i.e., both X1 and X2) are less influenced by stocks with international exposure and thus provide less correlated regional signals.

Exhibit 5 shows the distribution of EM exposure of MSCI World companies against the average beta with respect to the EM premium (X2). Historically, the returns of companies with higher economic exposure to emerging markets reflected, on average, a higher sensitivity to the EM premium. The trend line clearly slopes upwards, though some of the variation in the right side of the graph may be affected by small sample sizes.

Exhibit 5: EM Exposure and EM Sensitivity of Developed Market Companies



Data as of June 30, 2014

Regression beta estimated at the stock level using five years of monthly gross local returns. The figure on top of each bar shows the number of companies in each of the exposure ranges. Companies must have at least three years of stock price history to be included.

This analysis has been extended across several MSCI universes and target region combinations, as can be seen in Exhibit 6. To simplify the results, average stock beta is provided for only two exposure buckets: one with low exposure to the target (<=25%) and the other with high exposure to the target (>25%). For example, in the MSCI EM (Universe) and Europe Domestic (Target) combination, the green highlighted cell indicates that the average beta with respect to Europe domestic of all EM stocks that have high exposure to Europe is 0.45 – much higher than the average beta of all EM stocks that have low exposure to Europe (which is 0).

Across all universe-target combinations, stocks with high exposure to a target region are more sensitive to the target compared to stocks with low exposure. There is, however, a varying degree of beta dispersion between the two exposure buckets across universe-target pairs. Companies across major regions with high exposure to emerging markets reflect high sensitivity to EM in their stock prices.

<sup>4</sup> All domestic indexes were simulated for the purpose of research. These indexes target a fixed number of securities with an aim to attain a high domestic exposure with reasonable market cap coverage, as per the MSCI Economic Exposure Index methodology.



Similarly, EM companies with high exposure to North America and Europe are sensitive to those regions. In contrast, for companies that are exposed to the Pacific region, the beta dispersion is slight.<sup>5</sup>

Exhibit 6: Average Stock Sensitivity to Economic Exposure for MSCI Universe and Target combinations

Average Stock Beta relative to Economic Exposure		TARGET							
		North America (Domestic)		Europe (Domestic)		Pacific (Domestic)		EM (Domestic)	
		EE <=25%	EE >25%	<=25%	>25%	<=25%	>25%	<=25%	>25%
UNIVERSE	MSCI North America			0.06	0.11	-0.06	0.00	0.13	0.40
	MSCI Europe	0.40	0.51			0.04	0.12	0.18	0.56
	MSCI Pacific	0.27	0.56	0.18	0.32			0.09	0.75
	MSCI EM	0.03	0.25	0.00	0.45	-0.04	0.00		

\* Data as of June 30, 2014. Regression beta estimated at the stock level using 5 years of monthly gross local returns. Only companies with at least 3 years of stock price history were considered for analysis

\*\* Exposure buckets where dispersion in beta is greater than 0.20 are highlighted with a box

\*\*\* EE stands for Economic Exposure

## Evaluating Economic Exposure in Multi-Factor Framework

With the linkages between economic exposure and regional betas clear, we now evaluate the performance of a systematic investment factor (Bayraktar et al., 2013) based on economic exposure in a multifactor setting, to highlight its applicability in portfolio management.

Such an investment factor seeks to capture regional economic growth and is defined as the sum of the product of the economic exposure of a stock to different regions and the economic growth forecast of that region.

We estimate the performance of this systematic factor by running a cross-sectional regression of stock returns in a multivariate framework, where we introduce the economic exposure-based investment factor in addition to a set of market, industry and style factors. With this construction, the Economic Exposure factor portfolio generally holds long positions in stocks with high exposure to regions with positive economic prospects, short positions in stocks with high exposure to adversely affected regions, and no exposure to the other set of factors.

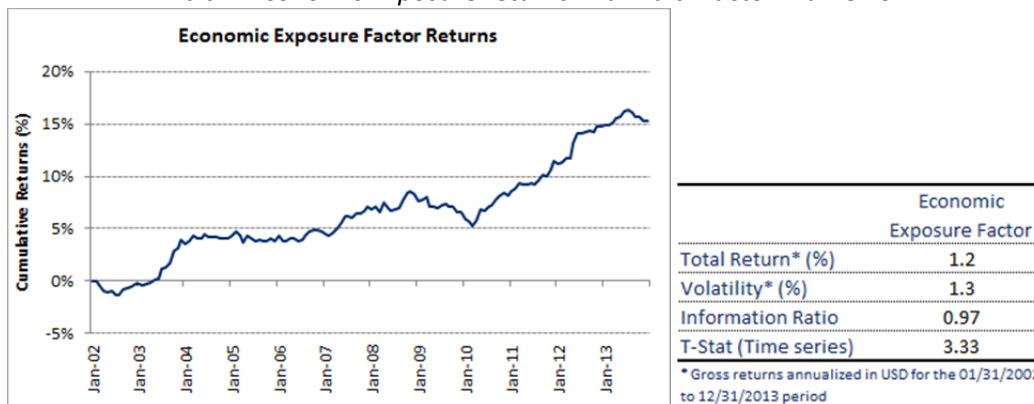
<sup>5</sup> Very few stocks across regions have high exposure to Pacific. This relatively small sample size makes it difficult to draw any conclusions about the sensitivity of stocks that have exposure to this region.

All factor exposures are standardized. Because the current monthly stock excess return is regressed against the previous month’s factor exposures, the estimated factor returns represent the out-of-sample performance of the strategy net of all other factors in the regression.<sup>6</sup>

As an illustrative example, we conducted a cross-sectional regression for the U.S. market after controlling for market, industry and style factors in the Barra US Equity Model. We used the trailing performance of relevant MSCI Country/Region indexes as leading economic indicators and proxy forecasts of the different regions.

Exhibit 7 shows that historically there has been a consistent and significant positive return associated with the implementation of the Economic Exposure factor. The Economic Exposure factor yielded 1.2% annually between March 2002 and December 2013 with an information ratio of 0.97.

Exhibit 7: Economic Exposure returns in a Multi-Factor Framework



Data as of Dec 31, 2013.

Economic Exposure Factor returns estimated for the U.S. market in USD gross total returns.

In summary, these empirical results underscore the linkages between macro drivers based on the economic exposure of companies and stock returns. In the next section, we build on this idea and present different approaches that institutional investors might adopt to construct portfolios which reflect various macroeconomic views by leveraging economic exposure data.

<sup>6</sup> More details on factor models and regression framework can be found at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1601414](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1601414).

### III. Economic Exposure in Global Equity Allocation

Institutional investors are increasingly adopting a global equity allocation, abandoning the traditional split between domestic and international stocks. As explained in “The ‘New Classic’ Equity Allocation?”<sup>7</sup> the evolution of global equity markets and investment processes is leading investors to embrace a global framework and move away from home country biases.

The capitalization-weighted global investment opportunity set forms the benchmark of choice at the policy level. Any deviation from the market-cap policy benchmark means that investors are making active factor, sector and regional as well as stock-level bets. Appendix 1 shows why an ACWI with developed market exposure index may not be suitable for a policy benchmark compared to the MSCI World Index. However, at the strategic level, investors may choose to construct portfolios that are alternatively weighted and therefore adopt MSCI Economic Exposure Indexes as meaningful benchmarks.

Within global mandates, institutional investors generally use two different approaches to introduce exposure to a target region. The first approach is through broad international or global mandates based on capitalization-weighted benchmarks that include targeted allocations to specific areas. For example, emerging markets can be typically accessed through ACWI ex USA, EAFE + EM or ACWI mandates. The second is through dedicated regional mandates, such as EM.

A third approach may be through mandates, based on a global universe of stocks, to access specific regions and linked to benchmarks such as the MSCI Economic Exposure Indexes. This approach may be useful for investors who have constraints on direct investment in securities domiciled in certain regions or countries. For example, some investors may have mandate restrictions on directly investing in certain emerging markets or may avoid direct investments due to issues related to governance, illiquidity or lack of suitable currency hedging instruments. For such investors, indirect investments through developed market stocks with high emerging markets exposure may provide an alternative.

Global investors can gain access to specific regions and markets via funds tracking the MSCI Economic Exposure Indexes to implement their macroeconomic views. For example, they may choose to tilt towards regions where they project relatively high levels of growth. Conversely, they may apply tilts away from specific regions or countries that have undesirable macroeconomic or geopolitical risks.

Active managers can use MSCI Economic Exposure Indexes in a number of different ways:

- Tilting their portfolios towards domestic stocks with higher international exposure.
- Creating a more “pure” domestic bias in their portfolio.
- Dynamically allocating to (or away from) securities in countries or regions that display momentum.
- Increasing or decreasing allocations via passive exposures.
- Developing an alternative way to diversify globally through a portfolio of companies with diversified regional exposure.

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<sup>7</sup> Kang, Xiaowei, Frank Nielsen and Giacomo Fachinotti. “New Classic Equity Allocation.” (October 2010). [http://www.msci.com/resources/research/articles/2010/The\\_New\\_Classic\\_Equity\\_Allocation\(Oct%202010\).pdf](http://www.msci.com/resources/research/articles/2010/The_New_Classic_Equity_Allocation(Oct%202010).pdf)

## Accessing International Markets

Active domestic managers who believe that international markets will perform better than the domestic market may want to tilt their portfolios towards domestic stocks with high international exposure. Exhibit 8 compares the performance of regional benchmarks with those geared towards high international exposure. From November 2006 to June 2014, North American, European and Pacific stocks with high international revenue streams performed well relative to their regional counterparts. This outperformance may be attributable both to companies' exposure to international markets as well as to the superior performance of international compared to domestic markets over the period of analysis. Thus, asset managers may tilt portfolios towards international stocks based on their return expectations.

*Exhibit 8: Accessing International Markets through MSCI Economic Exposure Indexes*

	North America	NA With International Exposure	Europe	Europe With International Exposure	Pacific	Pacific With International Exposure	Emerging Markets	EM With International Exposure	ACWI	ACWI with International Exposure
Total Return* (%)	6.9	7.6	3.6	7.1	2.6	3.2	5.2	4.6	5.1	5.9
Total Risk* (%)	16.7	17.7	22.2	20.7	17.6	20.9	25.2	25.0	18.4	20.0
Return/Risk	0.41	0.43	0.16	0.34	0.15	0.15	0.21	0.18	0.28	0.30
Sharpe Ratio	0.40	0.43	0.21	0.37	0.16	0.19	0.28	0.25	0.29	0.32
Active Return* (%)	0.0	0.8	0.0	3.5	0.0	0.6	0.0	-0.7	0.0	0.8
Tracking Error* (%)	0.0	4.4	0.0	6.0	0.0	7.5	0.0	5.6	0.0	3.5
Information Ratio	N/A	0.17	N/A	0.59	N/A	0.08	N/A	-0.12	N/A	0.23
Historical Beta	1.00	1.03	1.00	0.90	1.00	1.11	1.00	0.97	1.00	1.07
Turnover** (%)	2.2	6.0	2.4	14.0	2.2	6.1	5.5	10.8	2.5	6.3
Price to Book***	2.3	2.7	1.7	2.4	1.4	1.7	1.8	1.9	1.9	2.1
Price to Earnings***	16.6	16.5	13.1	14.9	18.7	18.1	13.2	12.3	15.3	14.5
Div. Yield*** (%)	2.1	1.9	3.7	3.0	2.6	2.3	2.6	2.4	2.7	2.8
Avg No of Stocks ^	709	176	486	92	494	124	811	203	2507	610
Market Cap Coverage (%) ^	100.0	32.3	100.0	24.6	100.0	32.2	100.0	36.9	100.0	34.2
Minimum Target Exposure #		0.56		0.96		0.54		0.51		0.66

\* Gross returns annualized in USD for the 11/30/2006 to 06/30/2014 period

\*\* Annualized one-way index turnover for the 11/30/2006 to 06/30/2014 period

\*\*\* Monthly averages for the 11/30/2006 to 06/30/2014 period

^ Average values across rebalancings from 11/30/2006 to 06/30/2014

# Minimum security level economic exposure to target as of 06/30/2014

For a more detailed look at the active factor and sector exposures of internationally oriented portfolios, please see Appendix 2.

Active managers with a strong positive view on the performance of a specific region may consider increasing their exposure to that region alone. Exhibit 9 presents the performance of MSCI Indexes with high emerging markets exposure between November 2006 and June 2014. The MSCI World with EM Exposure Index outperformed the MSCI World Index by about 0.7% on an annualized basis with a tracking error of 5.6% over the observation period, in large part because many European and Pacific companies benefited from their exposure to emerging markets during this period. The underperformance of North America with EM exposure may be attributed to the underperformance of emerging markets relative to North America during this period.

Exhibit 9: Accessing Target Country or Region through MSCI Economic Exposure Indexes

	North America	NA With EM Exposure	Europe	Europe With EM Exposure	Pacific	Pacific With EM Exposure	World	World With EM Exposure	ACWI	ACWI With EM Exposure	Emerging Markets
Total Return* (%)	6.9	6.8	3.6	5.4	2.6	3.8	5.2	5.9	5.1	4.8	5.2
Total Risk* (%)	16.7	17.9	22.2	23.7	17.6	22.4	17.9	20.9	18.4	23.3	25.2
Return/Risk	0.41	0.38	0.16	0.23	0.15	0.17	0.29	0.28	0.28	0.20	0.21
Sharpe Ratio	0.40	0.38	0.21	0.29	0.16	0.22	0.30	0.32	0.29	0.26	0.28
Active Return* (%)	0.0	-0.1	0.0	1.8	0.0	1.2	0.0	0.7	0.0	-0.4	0.0
Tracking Error* (%)	0.0	4.6	0.0	5.0	0.0	8.9	0.0	5.6	0.0	7.9	0.0
Information Ratio	N/A	-0.02	N/A	0.37	N/A	0.14	N/A	0.12	N/A	-0.05	N/A
Historical Beta	1.00	1.03	1.00	1.04	1.00	1.18	1.00	1.13	1.00	1.21	1.00
Turnover** (%)	2.2	7.9	2.4	11.7	2.2	11.1	2.2	11.7	2.5	10.3	5.5
Price to Book***	2.3	2.7	1.7	2.1	1.4	1.6	1.9	2.3	1.9	2.0	1.8
Price to Earnings***	16.6	17.7	13.1	14.0	18.7	18.6	15.6	15.9	15.3	14.5	13.2
Div. Yield*** (%)	2.1	1.9	3.7	3.1	2.6	2.0	2.7	2.5	2.7	2.6	2.6
Avg No of Stocks ^	709	150	486	103	494	124	1696	305	2507	1010	811
Market Cap Coverage (%) ^	100.0	31.3	100.0	29.4	100.0	29.9	100.0	23.0	100.0	27.5	100.0
Minimum Target Exposure #		0.21		0.23		0.28		0.29		0.41	

\* Gross returns annualized in USD for the 11/30/2006 to 06/30/2014 period  
 \*\* Annualized one-way index turnover for the 11/30/2006 to 06/30/2014 period  
 \*\*\* Monthly averages for the 11/30/2006 to 06/30/2014 period  
 ^ Average values across rebalancings from 11/30/2006 to 06/30/2014  
 # Minimum security level economic exposure to target as of 06/30/2014

Domestic Pure Play

Some investors may need or want to maintain a “pure” domestic bias in their domestic portfolios. However, these portfolios may have substantial foreign exposure through their domestic holdings (Cai and Warnock, 2012). Investors can reduce the foreign exposure of their domestic equity portfolios by investing in core domestic equities, i.e., companies with high domestic exposure. The motivation behind investing in core domestic equities is to provide a “pure play” on the domestic economy, mitigate any influence from foreign exposure and provide a less correlated source of equity returns. The domestic indexes are more distinct from each other; they display lower correlations than those of their regional counterparts, as can be seen in Appendix 3.

Exhibit 10 presents the performance of domestic indexes. Pacific and emerging markets indexes with high domestic exposure outperformed their regional benchmarks from November 2006 to June 2014. North America domestic and Europe domestic indexes, however, underperformed their regional benchmarks during this period. Appendix 4 details the style and sector biases of the domestic indexes.

Exhibit 10: Domestic exposure through MSCI Economic Exposure Indexes

	North America	North America With Domestic Exposure	Europe	Europe With Domestic Exposure	Pacific	Pacific With Domestic Exposure	EM	EM With Domestic Exposure	ACWI	ACWI With Domestic Exposure
Total Return* (%)	6.9	5.0	3.6	-2.1	2.6	2.7	5.2	5.8	5.1	4.0
Total Risk* (%)	16.7	16.6	22.2	24.7	17.6	15.3	25.2	25.1	18.4	16.8
Return/Risk	0.41	0.30	0.16	-0.08	0.15	0.18	0.21	0.23	0.28	0.24
Sharpe Ratio	0.40	0.29	0.21	-0.01	0.16	0.16	0.28	0.30	0.29	0.24
Active Return* (%)	0.0	-1.9	0.0	-5.6	0.0	0.1	0.0	0.6	0.0	-1.1
Tracking Error* (%)	0.0	4.0	0.0	5.7	0.0	8.4	0.0	4.6	0.0	3.7
Information Ratio	N/A	-0.47	N/A	-0.99	N/A	0.01	N/A	0.13	N/A	-0.31
Historical Beta	1.00	0.96	1.00	1.09	1.00	0.76	1.00	0.98	1.00	0.90
Turnover** (%)	2.2	5.8	2.4	9.7	2.2	8.0	5.5	16.1	2.5	7.2
Price to Book***	2.3	1.8	1.7	1.2	1.4	1.3	1.8	1.9	1.9	1.7
Price to Earnings***	16.6	17.1	13.1	12.1	18.7	21.7	13.2	14.1	15.3	16.5
Div. Yield*** (%)	2.1	2.5	3.7	4.5	2.6	2.7	2.6	2.7	2.7	2.7
Avg No of Stocks ^	709	300	486	201	494	175	811	352	2507	1003
Market Cap Coverage (%) ^	100.0	28.9	100.0	31.9	100.0	26.9	100.0	36.0	100.0	24.6
Minimum Target Exposure #		0.78		0.21		0.87		0.96		0.85

\* Gross returns annualized in USD for the 11/30/2006 to 06/30/2014 period  
 \*\* Annualized one-way index turnover for the 11/30/2006 to 06/30/2014 period  
 \*\*\* Monthly averages for the 11/30/2006 to 06/30/2014 period  
 ^ Average values across rebalancings from 11/30/2006 to 06/30/2014  
 # Minimum security level economic exposure to target as of 06/30/2014

## Macro Momentum through Economic Exposure

Global institutional investors may dynamically allocate to countries or regions to reflect regional momentum. One way to achieve this objective is by overweighting stocks that have high economic exposure to countries with high price momentum and underweighting those with high economic exposure to countries with low price momentum. For illustration purposes, we have simulated a long-only ACWI macro momentum index. Details on the construction methodology of this simulated index are provided in Appendix 5.

As shown in Exhibit 11, the ACWI macro momentum index outperformed the MSCI ACWI Index with a higher Sharpe ratio over the period November 2006 to May 2014. The historical information ratio is 0.24. The style, sector and regional biases of the ACWI macro momentum index are highlighted in Appendix 4.

Exhibit 11: Macro Momentum through Economic Exposure

	ACWI	ACWI Macro Momentum
Total Return* (%)	4.9	6.1
Total Risk* (%)	18.5	21.0
Return/Risk	0.27	0.29
Sharpe Ratio	0.28	0.33
Active Return* (%)	0.0	1.2
Tracking Error* (%)	0.0	5.0
Information Ratio	N/A	0.24
Historical Beta	1.00	1.11
Turnover** (%)	2.6	50.3
Price to Book***	1.9	1.7
Price to Earnings***	15.3	17.6
Div. Yield*** (%)	2.7	2.5

\* Gross returns annualized in USD for the 11/30/2006 to 05/30/2014 period

\*\* Annualized one-way index turnover for the 11/30/2006 to 05/30/2014 period

\*\*\* Monthly averages for the 11/30/2006 to 05/30/2014 period



## Economic Exposure Overlay on Passive Investments

Investors who have adopted a global mandate but seek to increase exposure to specific countries or regions of their choice may tilt their exposures by using funds based on the MSCI Economic Exposure Indexes. For example, investors who use the MSCI World Index as a policy benchmark can increase their exposure to emerging markets by combining passive funds based on MSCI World and MSCI World with EM Exposure Indexes. The proportion in which these indexes may be combined will be dictated by the exposure targets of investors.

Exhibit 12 shows the exposures and the performance characteristics of three such combinations as of June 2014, with increasing allocations to the MSCI World with EM Exposure Index. The economic exposure of these allocations to emerging markets progressively increases from 28% to 42%, with modest increases in volatility and tracking error with respect to the MSCI World Index. Across the three allocations, the 25%-75% allocation achieved the highest average annual return of 9.9% from Nov. 29, 2002 to June 30, 2014.

Alternatively, investors who want to reduce their emerging markets exposure may combine MSCI World and World with domestic exposure indexes. By adopting a 50%-50% combination of MSCI World and World with domestic exposure indexes, EM exposure drops to nearly 12%; this is well below the 22%

exposure to emerging markets displayed by MSCI World, as can be seen in Exhibit 12. Investors can thus adopt tilts to their policy benchmark by using passive funds linked to MSCI Economic Exposure Indexes.

Exhibit 12: Combining MSCI World and MSCI Economic Exposure Indexes

	ACWI	World	EM	World with Domestic Exposure	World with EM Exposure	World + World with Domestic Exposure	World + World with EM Exposure		
						50:50	75:25	50:50	25:75
Direct Exposure to emerging markets (%)	10.9	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
EM Economic exposure (%)	28.1	21.5	82.1	3.1	49.2	12.3	28.4	35.4	42.3
Total Return* (%)	9.5	9.3	14.5	8.1	10.0	8.8	9.5	9.7	9.9
Total Risk* (%)	16.0	15.6	22.9	13.8	18.2	14.5	16.1	16.7	17.5
Return/Risk	0.59	0.60	0.63	0.59	0.55	0.60	0.59	0.58	0.57
Sharpe Ratio	0.54	0.54	0.63	0.50	0.52	0.53	0.54	0.53	0.53
Active Return* (%)		0.0	5.1	-1.2	0.7	-0.5	0.2	0.4	0.5
Tracking Error* (%)		0.0	11.9	4.1	5.0	2.0	1.3	2.5	3.8
Information Ratio		N/A	0.43	-0.30	0.13	-0.27	0.17	0.16	0.15

\* Gross returns annualized in USD for the 11/29/2002 to 06/30/2014 period  
 Direct exposure to emerging markets refers to the market cap weight of emerging market companies in the index. Data as of 06/30/2014  
 EM Economic exposure is computed as the portfolio weighted EM exposure of each security. EM exposure data as of 06/30/2014

## Alternative Approach to Global Diversification

While some companies may have high international revenue exposures, their revenues may be highly concentrated in a handful of foreign countries. As of June 30, 2014, Yum Brands, a U.S.-based consumer discretionary company, had 77% revenue exposure to international markets, but the majority of its revenues (53%) were derived from China. High concentrations of revenue exposure can leave a company exposed to political and economic turmoil in specific markets. Companies that are genuinely diversified across countries may, however, be less affected by the idiosyncrasies of any given economy.

One approach for creating a portfolio of genuinely globally diversified companies is to select firms on the basis of revenue concentration. We calculate the revenue concentration of a company as the sum of its squared revenue exposures across different countries. A lower revenue concentration value indicates high diversity in a company’s revenue profile. For illustration purposes, we have constructed a globally diversified exposure index using the top 25% of stocks by market cap in the MSCI ACWI Index with the lowest revenue concentrations. We then compared its historical performance characteristics with the MSCI ACWI Index, as can be seen in Exhibit 13. From November 2006 to June 2014, the ACWI with globally diversified exposure index recorded a higher Sharpe ratio than the traditional MSCI ACWI Index, and a tracking error of 3.9%. The index had a high size and low leverage bias. It also systematically overweighted Energy, Materials and Information Technology, and underweighted Financials.

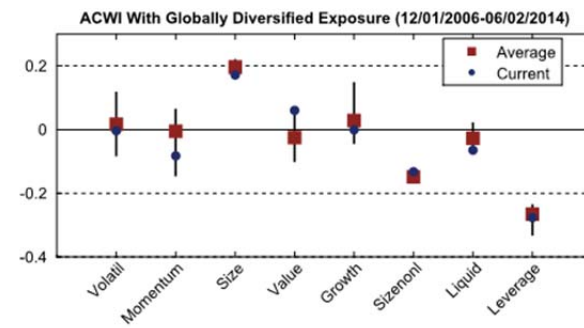
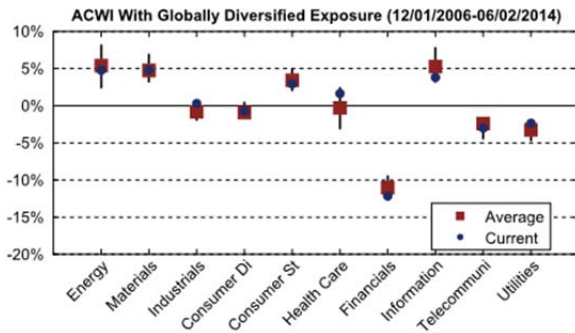
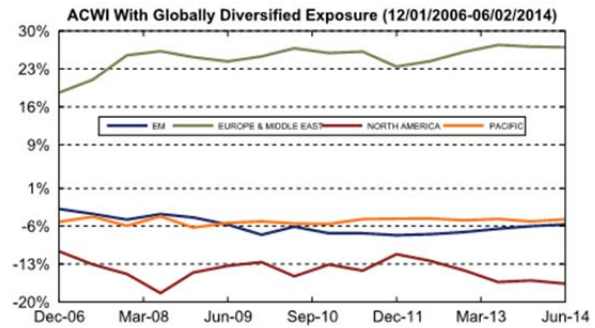
Exhibit 13: Historical Performance Characteristics of ACWI with Globally Diversified Exposure Index

	ACWI	ACWI With Globally Diversified Exposure
Total Return* (%)	5.1	6.2
Total Risk* (%)	18.4	20.1
Return/Risk	0.28	0.31
Sharpe Ratio	0.29	0.34
Active Return* (%)	0.0	1.1
Tracking Error* (%)	0.0	3.9
Information Ratio	N/A	0.28
Historical Beta	1.00	1.07
Turnover** (%)	2.5	15.1
Price to Book***	1.9	2.1
Price to Earnings***	15.3	14.2
Div. Yield*** (%)	2.7	2.8

\* Gross returns annualized in USD for the 11/30/2006 to 06/30/2014 period

\*\* Annualized one-way index turnover for the 11/30/2006 to 06/30/2014 period

\*\*\* Monthly averages for the 11/30/2006 to 06/30/2014 period





## Conclusion

The market-capitalization based benchmark reflects the complete investable opportunity set and is the benchmark of choice at the policy level. At the strategic or mandate level, institutional investors may consciously choose to depart from the global opportunity set and adopt alternatively weighted indexes such as MSCI Economic Exposure Indexes as strategic benchmarks for individual portfolios.

Economic exposure indexes are becoming increasingly important as companies expand their global operations and thus their exposure to international economic activity. A company's exposure to country risk results not solely from its place of incorporation or stock listing, but from where it does business. Economic exposure, derived from the geographic distribution of a company's revenues, provides an innovative way of characterizing its global, regional and country exposures.

The family of MSCI Economic Exposure Indexes has made it possible for investors to obtain a better understanding of the revenue exposure profiles of global and regional benchmarks, and to gauge the "true" geographic exposures of their portfolios. Furthermore, these indexes make it possible for investors to:

- Tilt their portfolios based on their macroeconomic views
- Shift their exposures by using an economic exposure index-based fund to complement their existing passive portfolio
- Achieve global diversification by creating a portfolio of companies with diversified regional revenue exposure
- Understand their portfolios at the total portfolio level as well as at regional and country levels, through the lens of economic exposure

In short, the Economic Exposure Indexes offer investors new insights and tools for an increasingly globalized investment world.

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# Appendix 1: Policy and Strategic Benchmarks

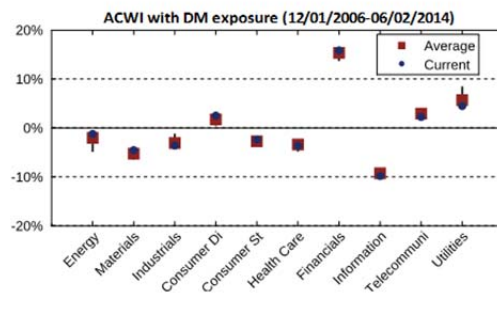
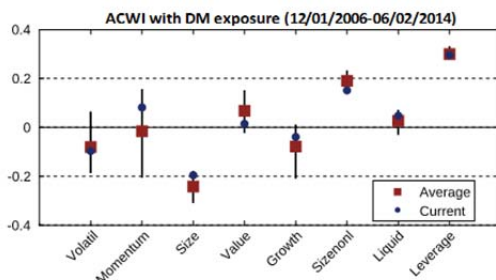
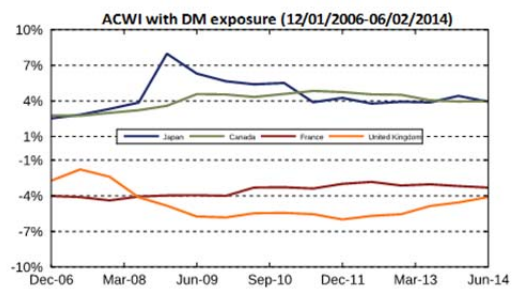
The MSCI Economic Exposure Indexes select a fixed number of securities from the Parent Index with the aim of attaining a high target exposure with reasonable market cap coverage. The MSCI Economic Exposure Indexes are not controlled for factor, sector, regional or stock level active bets and thus may not be suitable for a policy benchmark. The analysis below summarizes the active bets of an ACWI with developed market exposure index relative to the MSCI World Index.

One of the desired characteristics of a strategic benchmark is a low tracking error to the plan's overall policy benchmark. Between November 2006 and June 2014, the ACWI with developed market exposure index had a low tracking error of 3.4% with respect to MSCI World, making it suitable for use as a strategic benchmark.

*ACWI with DM exposure index relative to MSCI World Index (November 2006 – June 2014)*

	MSCI World Index	ACWI with DM exposure
Avg No of Stocks*	1696	755
Market Cap Coverage* (%)	100.0	31.9
Top 10 Sec Wt* (%)	9.7	12.7
Tracking Error** (%)	0.0	3.4
Turnover*** (%)	2.2	9.4

\* Average over all the corresponding rebalancing dates from 12/01/2006 to 06/02/2014  
 \*\* Gross returns annualized in USD for the 11/30/2006 to 06/30/2014 period  
 \*\*\* Annualized one-way index turnover for the 11/30/2006 to 06/30/2014 period



**Top Active Weights in ACWI with DM exposure index**

	Country	Sector	Weight (%)	Active Weight (%)
Wells Fargo & Co	US	Financials	2.3	1.5
AT&T	US	Telecommunication Services	1.6	1.1
JPMorgan Chase & Co	US	Financials	1.7	1.0
Bank of America Corp	US	Financials	1.3	0.8
Berkshire Hathaway B	US	Financials	1.2	0.8
Commonwealth Bank	AU	Financials	1.1	0.7
Disney (Walt)	US	Consumer Discretionary	1.1	0.7
Comcast Corp A (New)	US	Consumer Discretionary	1.0	0.6
Home Depot	US	Consumer Discretionary	0.9	0.6
Gilead Sciences	US	Health Care	1.0	0.6

As of 06/30/2014

**Bottom Active Weights in ACWI with DM exposure index**

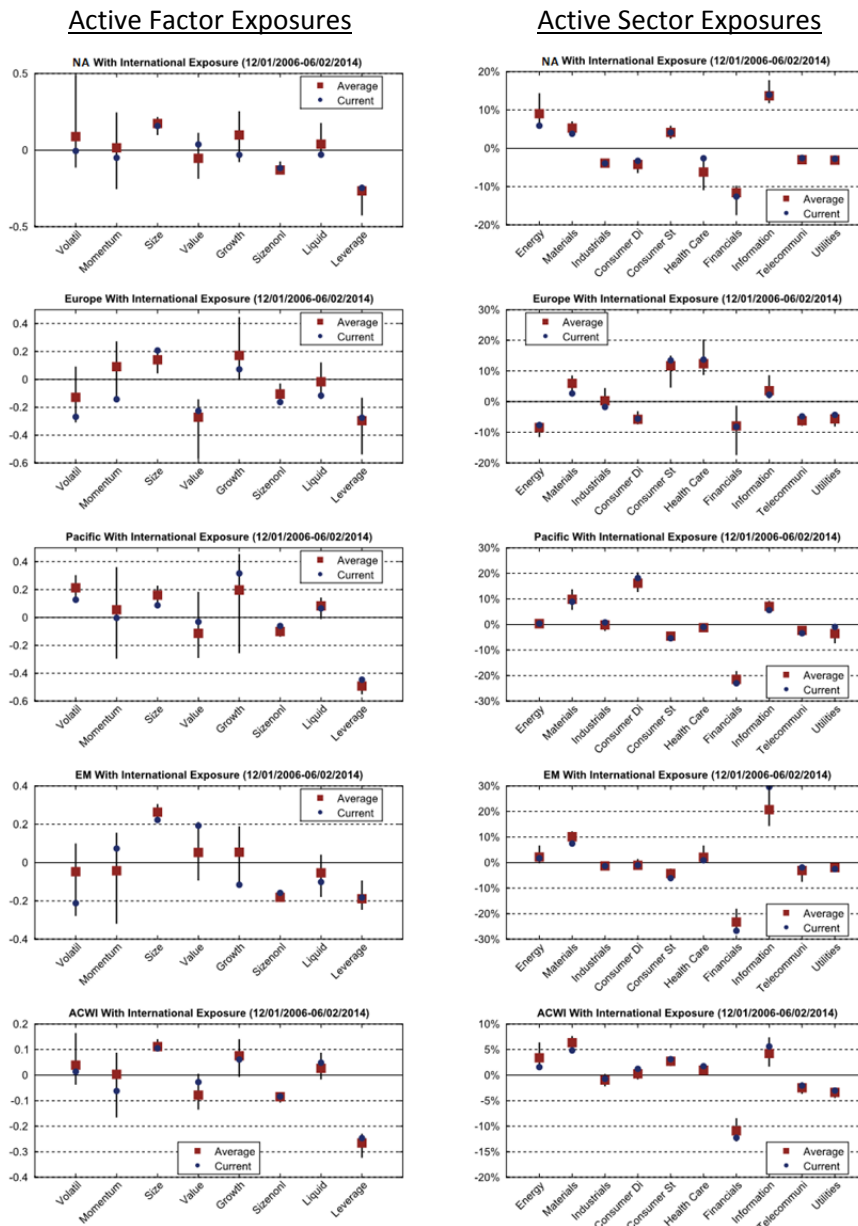
	Country	Sector	Weight (%)	Active Weight (%)
Apple	US	Information Technology	0.0	-1.7
Exxon Mobil Corp	US	Energy	0.0	-1.3
Microsoft Corp	US	Information Technology	0.0	-1.0
Johnson & Johnson	US	Health Care	0.0	-0.9
General Electric Co	US	Industrials	0.0	-0.8
Chevron Corp	US	Energy	0.0	-0.7
Nestle	CH	Consumer Staples	0.0	-0.7
Procter & Gamble Co	US	Consumer Staples	0.0	-0.6
Novartis	CH	Health Care	0.0	-0.6
Roche Holding Genuss	CH	Health Care	0.0	-0.6

As of 06/30/2014

# Appendix 2: Accessing International Markets

The charts below display active factor and sector exposures of regional indexes with international exposure from November 2006 to June 2014. Larger companies with low leverage and high growth characteristics consistently dominate these portfolios. The international exposure indexes overweighted global sectors such as Materials and Information Technology and underweighted more domestically oriented sectors such as Financials, Telecom and Utilities. These observations confirm the intuitive view that large companies are more globally diversified. Also, low leverage may be explained by an underweight in Financials and high growth may be a reflection of an overweight in high growth sectors such as Information Technology.

Active exposures to Investment Styles and Sectors (November 2006 – June 2014)

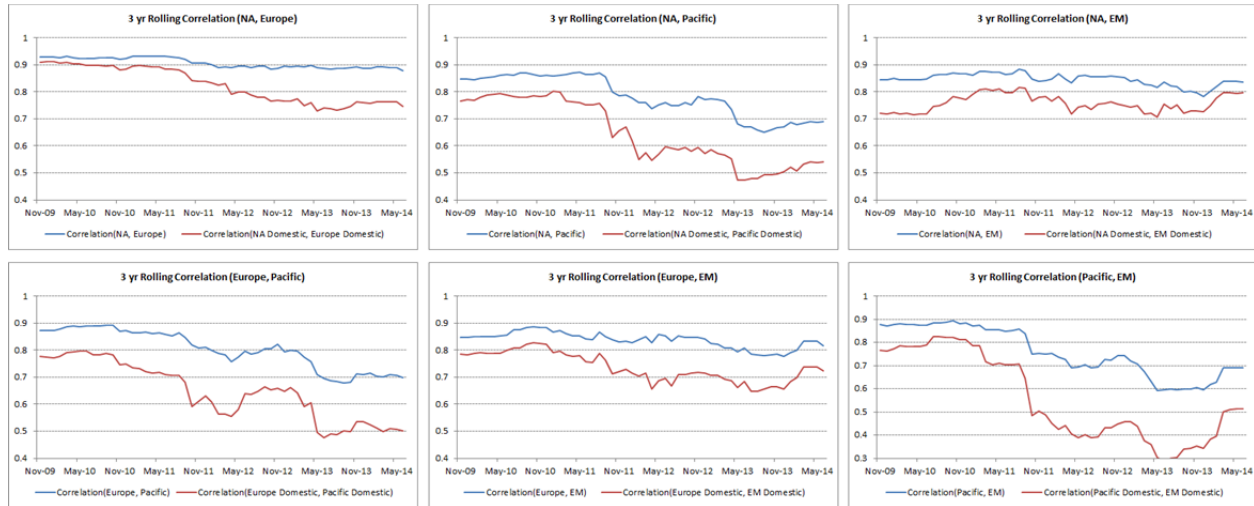


The red dot indicates the average exposure while the vertical line indicates the range between maximum and minimum exposure.

# Appendix 3: Historical Index Correlations

The charts below compare historical return correlations of indexes with domestic exposure against their regional counterparts. Indexes with domestic exposure were less correlated compared to the regional indexes, thus providing a less correlated source of equity return.

*Historical Index correlations (November 2009 – June 2014)*

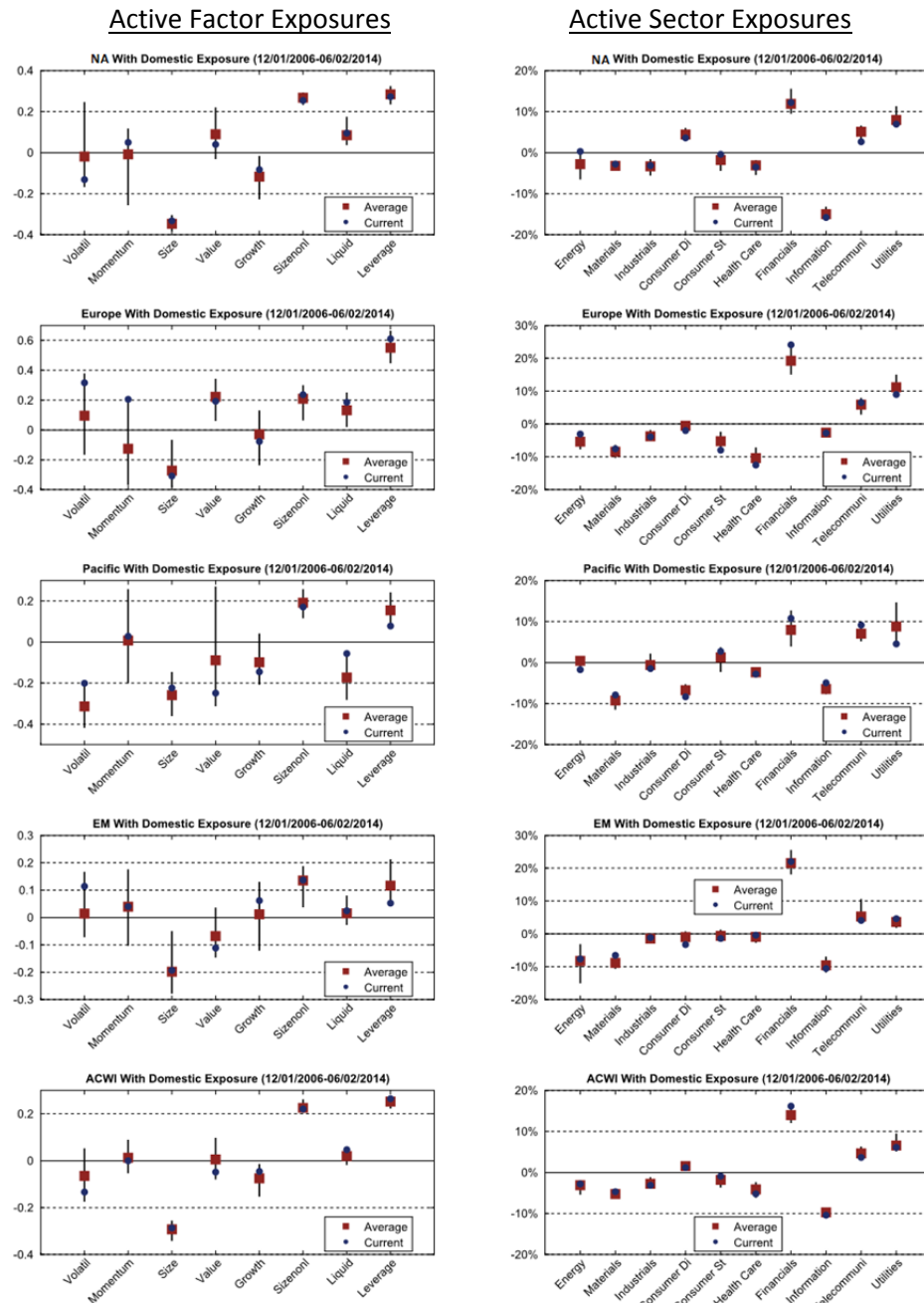


Indexes were simulated. Three-year rolling correlation between index levels in local currency.

# Appendix 4: Core Domestic Allocations

The charts below indicate active factor and sector exposures of various regional indexes with domestic exposure from November 2006 to June 2014. These indexes are characterized by exposure to smaller companies with high leverage. In contrast to indexes with international exposure, the domestic indexes overweighted Financials, Telecom and Utilities, and underweighted Materials and Information Technology.

Active exposures to Investment Styles and Sectors (November 2006 – June 2014)



The red dot indicates the average exposure while the vertical line indicates the range between maximum and minimum exposure.

# Appendix 5: Macro Momentum Index

## Simulated Index Methodology

At each semi-annual index rebalancing, a macro descriptor is computed for each security in the universe. The macro descriptor is the sum of the product of the security’s economic exposure to a country and the country’s price momentum as illustrated below:

$$Macro\_Descriptor_i = \sum_{j=1}^k EE_{ij} Country\_Momentum_j$$

$Macro\_Descriptor_i$ : Descriptor of stock i  
 $EE_{ij}$ : Economic Exposure of stock i to region j  
 $Country\_Momentum_j$ :  $(P_{T-1}/P_{T-7}) - 1$  of country j

Where,  $P_{T-1}$  = Security Local Price one month prior to the rebalancing date (T)

$P_{T-7}$  = Security Local Price seven months prior to the rebalancing date (T)

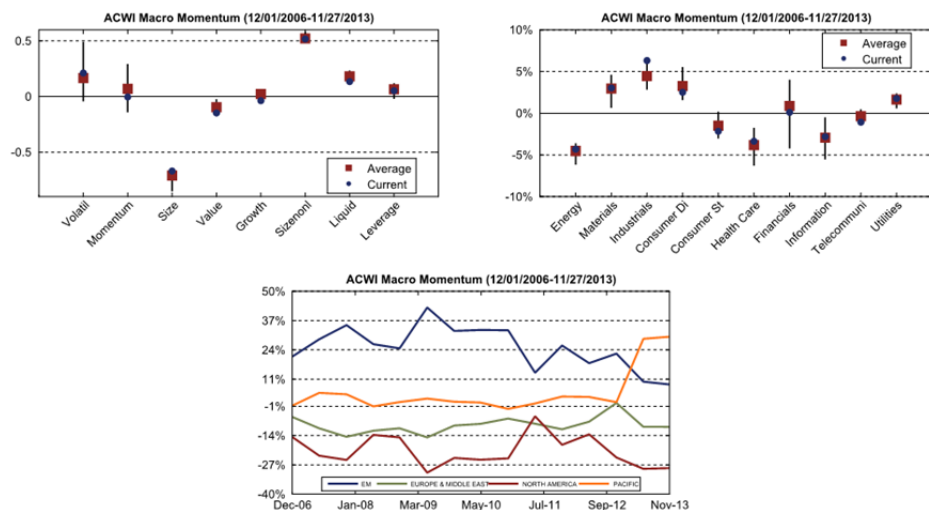
The macro descriptors are then standardized into z-scores and a final macro momentum weight of each security in the portfolio is computed as follows:

$$Macro\ Momentum\ weight = \begin{cases} 1+Z, & Z > 0 \\ (1-Z)^{-1}, & Z < 0 \end{cases}$$

## Active Exposures

The charts below indicate active factor, sector and regional exposures of the ACWI macro momentum index from November 2006 to November 2013. The index had a small-cap bias and overweighted Materials, Industrials and Consumer Discretionary and underweighted Energy, Health Care and Information Technology sectors. The portfolio also had an emerging markets bias, indicative of a higher relative regional momentum compared to other regions over the observation period.

Active exposures to Investment Styles, Sectors & Regions (November 2006 – November 2013)



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<sup>1</sup>As of March 31, 2014, as reported on June 25, 2014, by eVestment, Lipper and Bloomberg