Evaluating global benchmarks

Vanguard research

October 2012

Executive summary. The primary benchmarks representing the global stock market have been developed by long-established, well-respected providers, including MSCI, FTSE, Standard & Poor's, and Dow Jones.[1] Of course, to differentiate their products, each provider may employ different criteria and processes to construct and maintain its indexes. This paper expands upon our previous work on U.S. benchmark construction to evaluate the benchmarking methodologies of global benchmark providers.[2] Not surprisingly, we find that as global benchmarks focus on narrower market segments, the return differences across providers become more noticeable. Therefore, it is essential for investors to understand these distinctions when constructing a globally diversified portfolio. Note that the methodologies, practices, and implications presented here are neutral to an investor's country of domicile. The only visible difference in applying these methods from country to country would be the impact of investors' respective home currencies on returns.

Authors

Christopher B. Philips, CFA

Francis M. Kinniry Jr., CFA

1 As of July 1, 2012, the McGraw-Hill Companies, owners of the Standard & Poor's series of indexes, and CME group, owners of the Dow Jones series of indexes, merged. As of September 2012, it is unclear whether or how the various benchmarks identified in this report might change as a result of the merger.

2 For more on U.S. benchmark methodology, see Philips, and Kinniry (2012).

Whether selecting an appropriate benchmark for use with an index fund or exchange-traded fund (ETF) or evaluating the relative performance of an actively managed fund, several steps are involved. Broadly speaking, an investor must first define an investment objective and then identify a suitable level of market coverage to satisfy that objective. For example, market coverage can be defined as global, regional, or country exposure, or more specifically, exposure to a particular market cap or investment style. Next, an investor needs to understand how benchmark providers address these objectives and what these differences can mean in the context of constructing a global portfolio.

In the United States, market coverage is typically defined by market capitalization, by investment style (growth or value), and by how well a benchmark represents the potential opportunities afforded by a specific set of marketable securities. In the context of a global portfolio, however, choosing among providers incorporates an additional layer of distinction: geographic exposure. For example, an investor may seek exposure to the broad global market, or he or she may desire exposure to a narrower slice of that market by focusing specifically on developed or emerging markets. In so doing, it is important for investors to realize that different providers can define geographic regions differently. Even within a targeted region, for example, providers can vary in their breadth of security coverage (that is, in both country representation and depth of exposure). The impact of these additional layers of differentiation can mean increased complexity when examining methodologies across providers.

Using a 'tiered' approach to define market coverage

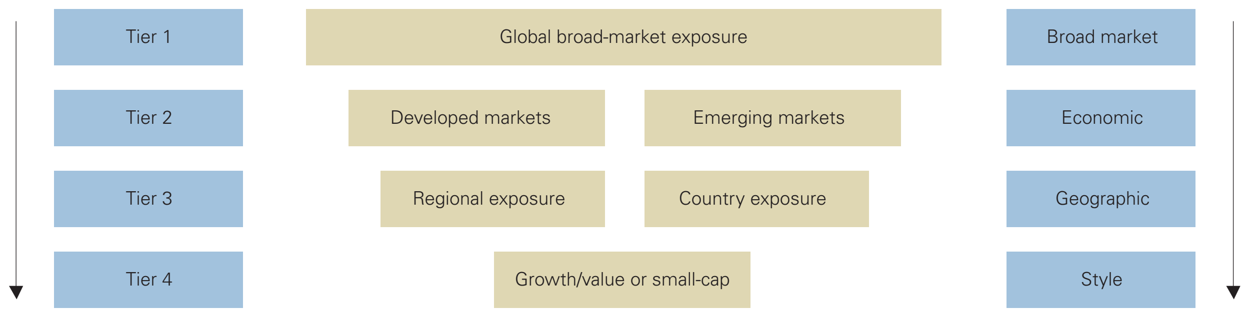
Similar to the process of evaluating U.S. benchmarks, an investor can conceptualize major global benchmarks' coverage by using what we refer to as a tiered framework, starting with the broadest available coverage and breaking that down into subcomponent indexes.[3] Not surprisingly, each provider uses different criteria to determine appropriate levels of market coverage for each subcomponent index. Given the differences in classification criteria, investors must understand the exposure that each index provides, in order to determine whether it adequately represents an investment objective. At the most basic level, global benchmarks can be broken down into four tiers, with each tier representing a narrower slice of the global market,[4] as shown in **Figure 1**.

Because of the multitiered structure and the varying levels of depth in market coverage, many potential benchmarks can provide "international stock exposure" to an investor in any domicile, assuming that investment options with adequate liquidity, transparency, and cost hurdles are available. That said, the portfolio impact of one option versus another may also be quite different.

3 We recognize that index providers may not refer to their indexes in a tiered framework. For this discussion, however, we believe that it is helpful to visualize the various layers in the form of tiers.

4 It should be noted that certain providers such as MSCI, FTSE, and S&P extend their indexes' coverage beyond developed and emerging markets. For example, the MSCI All Country World Index + Frontier Markets Index extends global coverage to frontier markets (primarily composed of securities from countries in Eastern Europe, the Middle East, or Sub-Saharan Africa). As of June 30, 2012, the MSCI Frontier Markets Index had an aggregate market capitalization of approximately $97 billion, or 0.8% of the global ex U.S. equity market. Similarly, FTSE has a dedicated index for frontier markets (the FTSE Frontier 50 Index) whose market cap as of June 30, 2012, was about $45 billion. Finally, S&P's frontier market index, the S&P Frontier Markets Broad Market Index (BMI), had a market cap of $192 billion. Given the negligible portion of the global market cap that is derived from frontier markets, we have excluded them from this analysis.

Figure 1. Global indexes broken down into tiers



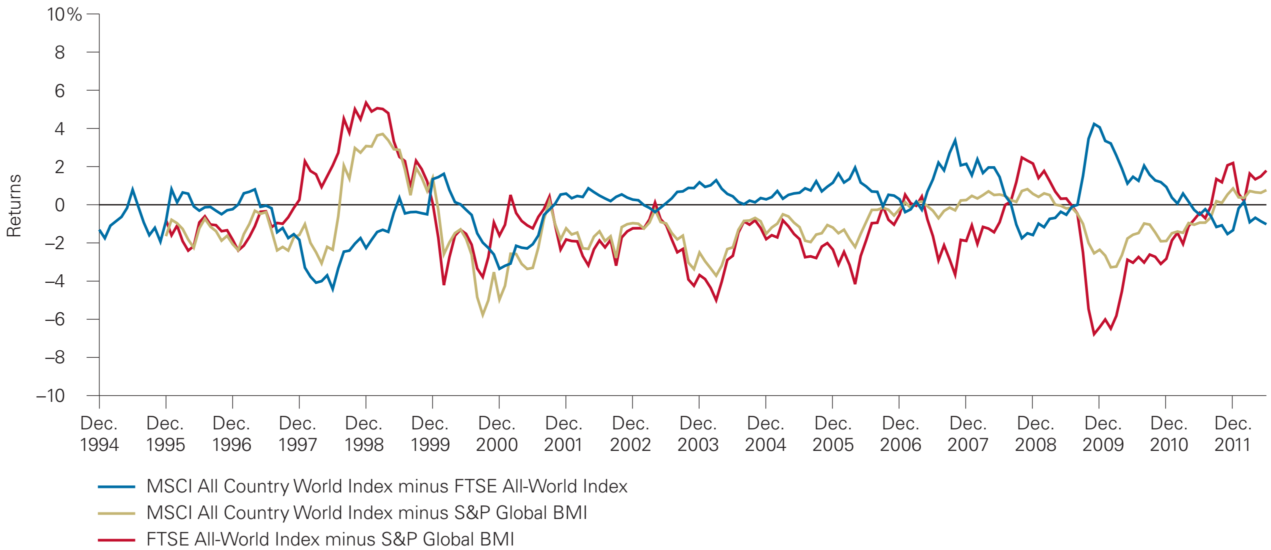
Source: Vanguard

Criteria for inclusion: Global broad-market indexes

Each of the four major index providers—MSCI, FTSE, Standard & Poor's, and Dow Jones—has developed its own criteria to screen securities for inclusion in its broadest global market index. (The accompanying appendix contains a comprehensive review of the inclusion criteria for each *tier* of international exposure, by provider.) Despite some technical differences, a number of common factors exist across providers. For example, all indexes are market-cap-weighted and adjusted for free float. In addition, each security in an index must meet a predetermined liquidity requirement and free-float threshold to ensure that the indexes are fully investable and accessible to all investors.

Finally, providers may treat stocks identified as small-cap differently when defining their broadest geographic coverage. For example, the S&P Global Broad Market Index (or S&P Global BMI) includes large-, mid-, and small-cap securities, while the FTSE All-World Index includes only large- and mid-cap securities. Both FTSE and MSCI offer separate indexes dedicated to small-cap stocks for many of their respective Tier 1 and Tier 2 indexes. As a result, it's important for investors to be aware that similarities in geographic coverage across providers do not always signify similarities in the depth of market coverage, and that, for complete market coverage using FTSE or MSCI indexes, investors must consciously include an allocation to a fund or ETF focused on small-cap stocks.

Figure 2. Return differences have not persisted among Tier 1 (global) benchmarks: Rolling 12-month return differential, December 31, 1994–June 30, 2012



Note: Data for these indexes begin January 1, 1994.

Source: Vanguard, based on data provided by Thomson Reuters Datastream.

Because of the overlap in security-inclusion criteria across providers, we would expect the "Tier 1 indexes" to generate very similar returns and to exhibit a similar responsiveness to systematic market-risk factors. **Figure 2**, which plots the rolling return differentials between the broad-market global indexes, confirms this expectation. In addition, correlations among these Tier 1 indexes have historically been in excess of 0.99, so there is little difference in risk exposures.

Criteria for inclusion: Developed and emerging market indexes

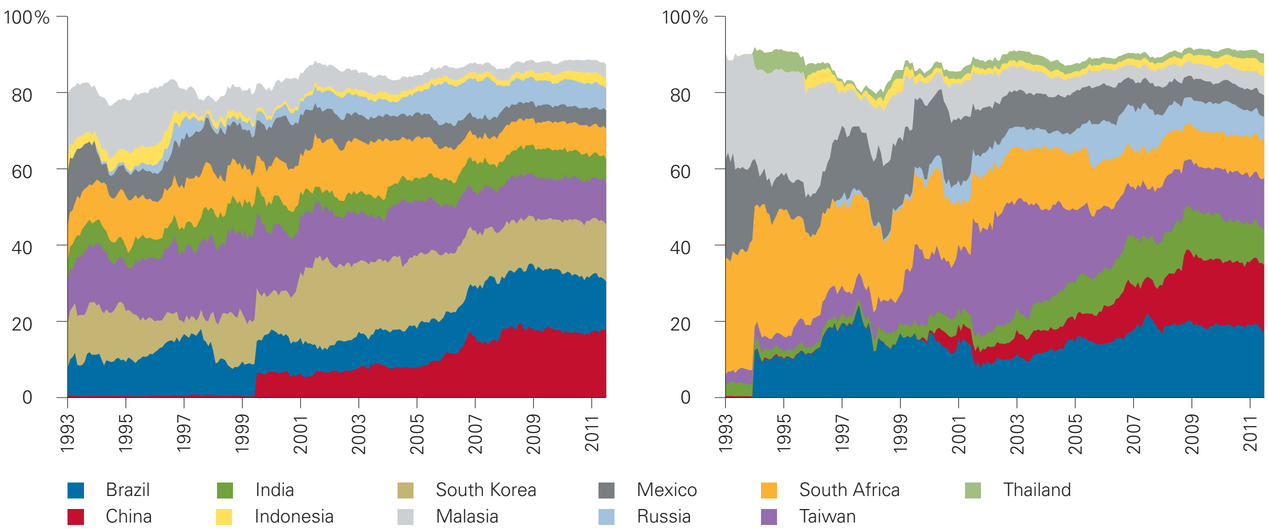
Although specific criteria for classifying an economy as developed or emerging differ from provider to provider, several themes recur. Today's common factors include market capitalization, infrastructure reliability, and the sustainability of a country's economic development. Over time these criteria have led to some differences in constituents, particularly in emerging markets. For example, in 1994, three countries accounted for 85% of the FTSE Emerging Markets Index (Malaysia, 28%; Mexico, 26%; and South Africa, 31%), while the MSCI Emerging Markets Index was more balanced, with the three-largest countries accounting for 43% of the index's total assets (Malaysia, 17%; Mexico, 14%; and South Korea, 12%). **Figure 3** illustrates the evolution of the top-ten country weightings (as of June 30, 2012) for these benchmarks.

Given the differences in the indexes' construction in the mid-1990s, we were not surprised to find a significant difference in returns at that time between FTSE and MSCI (see **Figure 4**). Today, the allocations are much more similar, resulting in less-extreme return differentials as well as much higher correlations. In fact, as was also true for the broad global benchmarks, over the past ten years, correlations between the FTSE and MSCI emerging market indexes have consistently exceeded 0.99.

Figure 3. Evolution of ten-largest country allocations (as of June 30, 2012) for MSCI and FTSE Emerging Markets Indexes: December 31, 1993–June 30, 2012

a. MSCI Emerging Markets Index geographic composition

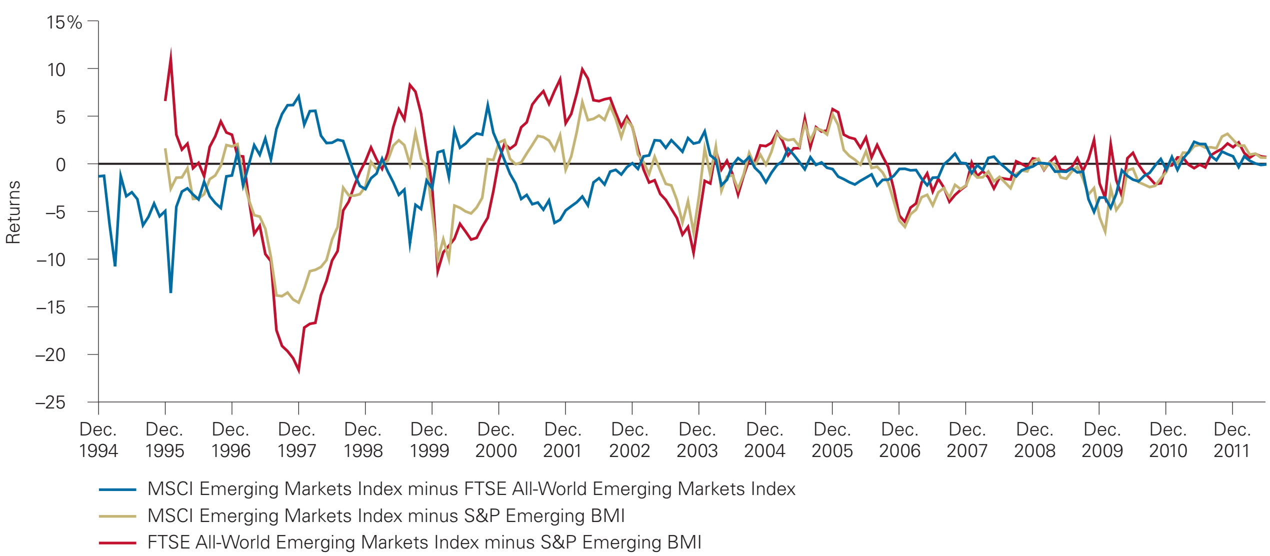
b. FTSE Emerging Markets Index geographic composition



Note: Data for these indexes begin January 1, 1994.

Source: Vanguard, based on data provided by Thomson Reuters Datastream.

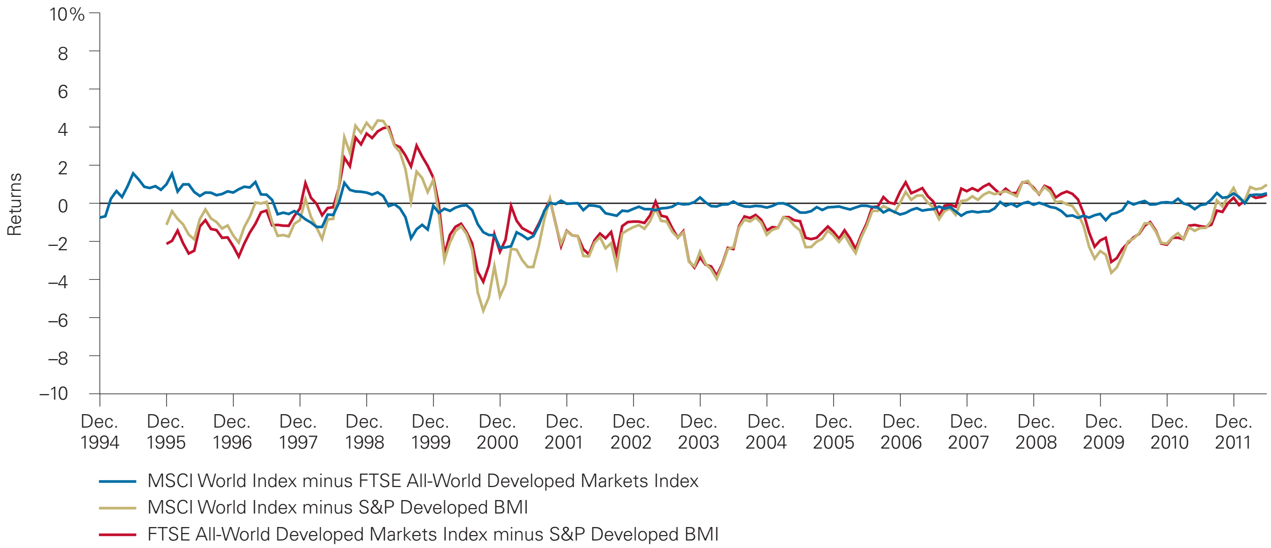
Figure 4. Return differences have not persisted among Tier 2 emerging market benchmarks: Rolling 12-month return differential, December 31, 1994–June 30, 2012



Note: Data for these indexes begin January 1, 1994.

Source: Data provided by Thomson Reuters Datastream.

Figure 5. Return differences have not persisted among Tier 2 developed market benchmarks: Rolling 12-month return differential, December 31, 1994–June 30, 2012



Note: Data for these indexes begin January 1, 1994.

Source: Vanguard, based on data provided by Thomson Reuters Datastream.

As expected, among developed markets, the broad themes in country and security inclusion have led to many more similarities than differences. The most noticeable difference was in 1994, when the United States and Japan together accounted for approximately 5% more of the FTSE All-World Developed Markets Index's asset weighting than that of the MSCI World Index. Today, the benchmarks' weightings are even closer, with differences in country exposure between the two providers commonly within 1%. The result is little meaningful differentiation with respect to historical returns (see **Figure 5**).

From evidence presented in Figures 2–5, we concluded that any differentiation with respect to country inclusion and weightings is marginal among global, developed, and emerging market indexes.

Figure 6 provides a more complete, side-by-side comparison of the country representation for each of the four benchmark providers. In addition to differences in breadth, each provider may vary its relative exposure within a country. In other words, although each of the providers offers exposure to Brazil, for example, their weighting in the country and depth of market coverage vary. Essentially, while each of the four providers targets a significant majority of each country's market capitalization, different criteria are used to determine whether a specific security should be included in the pool. For example, while MSCI includes "all listed securities . . . that exhibit characteristics of equity securities," FTSE's criteria include "permission for direct equity investment by non-nationals; ability to retrieve dividends and capital gains in timely manner; and existence of adequate liquidity."[5]

5 See MSCI and FTSE benchmark methodology documents, at mscibarra.com and ftse.com, respectively.

Figure 6.	Country exposure for developed and emerging markets, by index provider (%)

a. Developed Markets

	Dow Jones	FTSE	MSCI	S&P
Australia	3.43%	3.57%	3.56%	3.44%
Austria	0.13	0.14	0.11	0.14
Belgium	0.43	0.42	0.46	0.46
Canada	4.73	4.31	4.87	4.88
Denmark	0.46	0.52	0.47	0.47
Finland	0.36	0.36	0.29	0.36
France	3.32	4.16	3.74	3.33
Germany	2.94	3.52	3.26	3.04
Greece	0.05	0.04	0.02	0.06
Hong Kong	1.10	1.99	1.22	1.48
Iceland	0.03			
Ireland	0.18	0.07	0.12	0.17
Israel	0.27	0.28	0.24	0.30
Italy	0.92	1.05	0.89	0.98
Japan	9.69	8.46	8.89	8.96
Luxembourg				0.12
Netherlands	0.91	1.44	0.97	0.99
New Zealand	0.09	0.07	0.05	0.08
Norway	0.43	0.45	0.38	0.44
Portugal	0.07	0.10	0.06	0.09
Singapore	0.90	0.79	0.76	0.82
South Korea	2.01	2.48		2.41
Spain	0.95	1.23	1.10	1.00
Sweden	1.27	1.31	1.27	1.26
Switzerland	3.12	3.50	3.47	3.17
Taiwan	1.81			
United Kingdom	8.65	9.04	9.47	8.83
United States	51.75	50.72	54.32	52.71

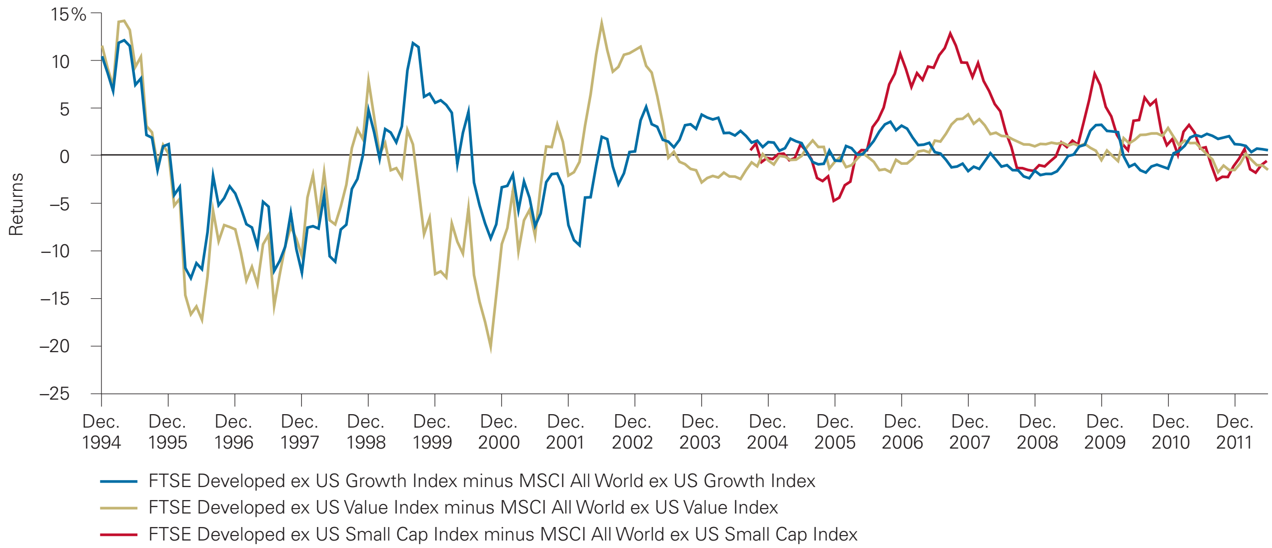
a. Emerging Markets

	Dow Jones	FTSE	MSCI	S&P
Brazil	16.94%	18.55%	13.10%	14.28%
Chile	3.21	2.44	1.99	2.64
China	22.87	16.60	17.85	19.50
Colombia	1.71	1.21	1.28	1.53
Czech Republic	0.38	0.42	0.31	0.33
Egypt	0.55	0.46	0.34	0.44
Hungary	0.32	0.42	0.29	0.33
India	10.44	9.53	6.46	8.58
Indonesia	4.13	3.26	2.72	3.46
Malaysia	4.88	4.77	3.56	3.72
Mexico	5.64	5.66	5.00	5.88
Morocco	0.37	0.11	0.09	0.34
Pakistan		0.12		
Peru	0.82	0.53	0.70	0.92
Philippines	1.83	0.87	0.94	1.45
Poland	1.98	1.36	1.43	1.59
Russia	9.18	6.51	5.96	7.12
South Africa	9.17	9.98	7.96	8.47
South Korea			15.18	
Taiwan		12.89	11.00	14.63
Thailand	3.23	2.40	2.17	2.74
Turkey	2.36	1.61	1.67	2.06
United Arab Emirates		0.28		

Notes: Owing to rounding, percentages may not add to 100%.

Sources: FTSE, MSCI, Dow Jones, and Standard & Poor's. Country representation and weightings as of June 30, 2012.

Figure 7. Greater variation in performance can be seen across style indexes for developed markets: Rolling 12-month return differential, December 31, 1994–June 30, 2012



Notes: Similar results are available using the Standard and Poor's Developed BMI. We excluded the S&P indexes from this chart for clarity of presentation. Data for these indexes begin January 1, 1994.

Source: Vanguard, based on data provided by Thomson Reuters Datastream.

Criteria for inclusion: Style indexes

Similar to inclusion criteria for style benchmarks within the United States, criteria for inclusion in growth or value global indexes differ among providers. FTSE uses nine factors (four value and five growth), MSCI uses eight factors (three value and five growth), and S&P uses seven factors (four value and three growth). For specific factors used by each provider, please see the appendix. In addition to the number of factors used to classify securities, the evaluation period varies across providers; for example, S&P uses five-year trailing metrics, while FTSE uses two- to three-year trailing as well as forward-looking metrics.

Providers can differ, too, in their definition of, and accounting for, small-cap stocks. In fact, it is increasingly common for the primary benchmarks from all providers to cover large- and mid-cap stocks and to use separate benchmarks for the small-caps. For instance, the MSCI EAFE Index targets the largest 85% of securities, while, all told, the MSCI EAFE Small Cap Index expands the coverage to target the largest 99% of securities. The specific range of securities covered by the small-cap indexes differs from provider to provider. For example, FTSE small-cap indexes target the smallest 10% of all securities, while MSCI, S&P, and Dow Jones indexes each cover the smallest 15%.

Not surprisingly, given the range of criteria for categorizing growth, value, and small-cap stocks, performance can be expected to differ somewhat over time.[6] **Figure 7** shows the performance differentials between MSCI and FTSE indexes since December 31, 1994. It is interesting that although variation was significant throughout the 1990s, growth and value indexes from these two providers appear to have converged in the 2000s as performance differentials have been much more muted. Because of the difference in inclusion criteria for small-cap stocks, the degree of variation between MSCI and FTSE small-cap indexes is not unexpected.

6 Note, however, that an investment manager may choose not to use a style benchmark for a global mandate with a style orientation. Rather, the manager may choose to use a blended benchmark, one possible reason being that the style benchmark's orientation is more or less pronounced than that of the fund's objective.

Implications for portfolio construction

In evaluating the suitability of the various indexes for a given mandate, it is important to understand each index's construction and coverage. As we have shown with the Tier 1 indexes, although criteria for inclusion can differ across providers, return differentials have been relatively muted, given the breadth of coverage that each provides. Therefore, if an investor wishes to construct a pure market-cap-weighted portfolio with exposure to the aggregate global investable market, it is difficult to argue that any one provider offers superior geographic coverage, or any sustainable performance advantage. In such a scenario, an assessment of the relative costs of using the investment vehicles (index funds or ETFs) or benchmarking tools (to evaluate the performance of active managers) of one provider versus another is likely a good place to start in determining which benchmark provider is most appropriate.

Other investors may not use a single fund or benchmark to gain exposure to the global investable market. Rather, they may employ a bottom-up approach by using subcomponent indexes to construct their desired global exposure, believing that this approach will add flexibility in constructing the portfolio. For example, specific geographic regions within the global indexes may be under-weighted or overweighted in a portfolio, depending on the investor's particular goal, objective, or belief: Thus an investor with a portfolio solely allocated to his or her local stock market could, for instance, add a percentage of international equity exposure, using the developed and/or emerging market indexes. Further segmentation can be achieved by the portfolio's positioning with respect to countries, size (market capitalization), or style (growth or value).

Because benchmarks generally become less similar as an investor moves from Tier 1 through Tier 4, more thought may be required to select among available options. This is particularly true if the investor intends to combine benchmarks from different providers.

As we have shown in the small-cap space, for example, different benchmark providers define market segments differently, so by obtaining exposure to the large- and mid-cap segments from provider A and small-cap exposure from provider B, an investor could be duplicating or eliminating market coverage. Without careful consideration, an investor could unintentionally drift from his or her investment objective by not recognizing methodology differences across index providers.

Conclusion

Selecting the most appropriate benchmark ultimately requires an examination of the investment objective, accessibility, and cost. As we have shown, despite minor differences in selection methodology, return differentials across the broad global benchmarks have been negligible, while correlations have remained high. Therefore, for an investor seeking broad global market coverage, the decision ultimately comes down to preference, accessibility, and, literally, the price of gaining exposure to a particular provider. Some practitioners have strong preferences for a particular methodology; others have idiosyncratic circumstances (such as in-house computer systems that are based on a particular provider) that favor a particular methodology. For those investors who are truly indifferent to methodologies, an examination of cost and accessibility to broad-market indexes is the best place to start in selecting a provider.

However, as the targeted coverage focuses on narrower slices of the market, subtle differences in selection criteria tend to have a more exaggerated effect on returns. Therefore, for investors using subcomponent indexes to gain global exposure, it is important to initially evaluate the market coverage of each subcomponent index, to ensure that it satisfies the investment objective. Subsequently, an evaluation of cost and accessibility can be used to ultimately select the provider that is best suited to the investor's personal circumstances.

Reference

Philips, Christopher B., and Francis M. Kinniry Jr., 2012. *Determining the Appropriate Benchmark: A Review of Major Market Indexes*. Valley Forge, Pa.: The Vanguard Group.

Appendix. International benchmarking methodology, by index provider

	FTSE	MSCI
Weighting and float-adjustment methodology	Market-cap-weighted, adjusted for free float.	Market-cap-weighted, adjusted for free float.
Maintenance	Periodic reviews in addition to annual country reviews on a region-by-region basis.	Quarterly and semiannual reviews.
Liquidity requirements	Securities must exceed a minimum turnover threshold determined by the security's median daily trading volume per month.	Securities must meet a specified trading volume determined by annual traded value ratio and frequency of trading requirement.
Security free-float requirements	Free float > 15%. **Exception:* Security that has free float between 5%–15% will be included, provided it meets a minimum market-cap threshold.	Free float ≥ 50% of the equity universe minimum size requirement.
Tier 1: Broad-market classification	*Securities included:* Shares listed on a stock exchange or recognized market that are in the top 98% of each region by full market cap. *Securities excluded:* Convertible preferred shares or loan stocks and shares not listed as part of an eligible share class.	*Securities included:* All listed equity securities, or listed securities that exhibit characteristics of equity securities. *Securities excluded:* Mutual funds, ETFs, equity derivatives, limited partnerships, and most investment trusts.
Tier 2: Economic classification (developed or emerging markets)	1. Wealth (GNI per capita). 2. Total stock market capitalization. 3. Breadth and depth of market. 4. Whether there are any restrictions on foreign investment. 5. Free flow of foreign exchange. 6. Reliable and transparent price discovery. 7. Efficient market infrastructure. 8. Oversight by independent regulator.	1. Sustainability of economic development. 2. Number of companies meeting predetermined market cap and liquidity requirement. 3. Openness to foreign ownership. 4. Ease of inflows/outflows. 5. Efficiency of operational framework. 6. Stability of the institutional framework.
Tier 3: Geographical classification (region or country)	1. Permission for direct equity investment by non-nationals. 2. Availability of timely data. 3. Ability to retrieve dividends and capital gains in timely manner. 4. Demonstration of international interest. 5. Existence of adequate liquidity.	1. Minimum size requirement, must fall in top 99% of investable market cap. 2. Minimum market-cap requirement, varies by market (i.e., developed or emerging). 3. Minimum liquidity requirement. 4. Global foreign inclusion factor requirement. 5. Minimum length of trading requirement.
Tier 4a: Style classification (growth or value)	**Value criteria (4)** 1. Price to book value per share. 2. Price to sales per share. 3. Dividend yield. 4. Price to cash flow per share. **Growth criteria (5)** 1. 3-year historic EPS growth rate. 2. 3-year historic sales growth rate. 3. 2-year forward EPS growth rate. 4. 2-year forward sales growth rate. 5. Equity growth rate.	**Value criteria (3)** 1. Book value per share to price. 2. 12-month forward earnings per share to price. 3. Dividend yield. **Growth criteria (5)** 1. Long-term forward EPS growth rate. 2. Short-term forward EPS growth rate. 3. Current internal growth. 4. Long-term historical EPS growth trend. 5. Long-term historical sales per share growth trend.
Tier 4b: Style classification (market-cap breakdown for large-, mid-, or small-cap)	Large-cap: >72%.* Mid-cap: Between 72% and 92%. Small-cap: <92%.	Large-cap: Top 70% +/– 5%. Standard index: Top 85% +/– 5%. Mid-cap: Standard index minus large-cap index. Small-cap: 99% + 1% or minus 0.5% minus standard index.

*FTSE applies buffers for each capitalization band.

	S&P	Dow Jones
Weighting and float-adjustment methodology	Market-cap-weighted, adjusted for free float.	Market-cap-weighted, adjusted for free float.
Maintenance	Annual reviews.	Monthly, quarterly, and semiannual reviews.
Liquidity requirements	Securities must meet an annual dollar value traded.	Securities must meet quarterly trading criteria.
Security free-float requirements	Determined using S&P Investable Weight Factor (IWF) methodology.	Float adjustments based on block ownership of uninvestable shares.
Tier 1: Broad-market classification	*Securities included:* All publicly listed equities with a minimum float-adjusted market value of U.S. $100 million. *Securities excluded:* Fixed-dividend shares, investment trusts, unit trusts, mutual fund shares, closed-end funds, convertible bonds, equity warrants, and limited partnerships.	*Securities included:* Shares on recognized exchanges representing top 98% of country's float-adjusted market cap for developed markets and 95% for emerging markets. *Securities excluded:* Fixed-dividend shares and securities such as convertible notes, warrants, rights, mutual funds, unit investment trusts, publicly traded partnerships, LLCs, royalty trusts, and closed-end funds.
Tier 2: Economic classification (developed) or emerging markets)	1. Macroeconomic conditions, political stability, and government restrictions. 2. Relative market size large enough to affect overall portfolio. 3. Market structure: >5 listed companies, float-adjusted market cap, minimum dollar value traded. 4. Investment conditions: settlement and foreign exchange procedures, foreign exchange access, capital controls and restrictions, rules on trading.	Determined by International Monetary Fund (IMF) classifications.
Tier 3: Geographical classification (region or country)	1. Country with float-adjusted market cap ≥ U.S. $1 billion. 2. Market weight > 40 bps in representative developed or emerging market index. 3. Availability to foreign ownership. 4 Ease of capital inflows and outflows. 5. Efficiency of operational framework.	1. Accessibility to nonresidents. 2. Availability of a convertible currency, real-time stock pricing and currency exchange rates as well as historical market data. 3. Accessibility to reliable data sources. 4. Measures of economic freedom. 5. Timetable for adding or removing countries.
Tier 4a: Style classification (growth or value)	**Value criteria (4)** 1. Book value per share to price. 2. Sales per share to price. 3. Cash flow per share to price. 4. Dividend yield. **Growth criteria (3)** 1. 5-year historical EPS growth rate. 2. 5-year historical SPS growth rate. 3. 5-year average annual internal growth rate.	N.A.
Tier 4b: Style classification (market-cap breakdown for large-, mid-, or small-cap)	Large-cap: Top 70%. Mid-cap: Top 70%–85%. Small-cap: Top 85%–100%.	Large-cap: Top 85%. Mid-cap: Top 80%–90% (overlaps large- and small-cap). Small-cap: Top 85%–100%.

Notes: GNI = gross national income; BPS = basis points; EPS = earnings per share; SPS = sales per share.

Sources: FTSE, MSCI, Standard & Poor's, and Dow Jones, as of December 31, 2011.

P.O. Box 2600
Valley Forge, PA 19482-2600

Connect with Vanguard® > vanguard.com

Vanguard research >
Vanguard Center for Retirement Research
Vanguard Investment Counseling & Research
Vanguard Investment Strategy Group

E-mail > research@vanguard.com

For more information about Vanguard funds, visit vanguard.com, or call 800-662-2739, to obtain a prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

CFA® is a trademark owned by CFA Institute.

ICREGB 102012