Wilshire

Accessing Global Markets with precision

An introduction to the FT Wilshire Global Equity Market Series

Whitepaper

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Introduction

A brief history of the FT Wilshire 5000 Index Series

As a pioneer of the index industry, the Wilshire 5000 Index was introduced to investment professionals in 1974. It is the oldest broad-based market cap index covering the entire US investible market.

When the index was established, it contained approximately 5,000 stocks as the name suggested. As the US equity market evolved, the number of index constituents fluctuated, from over 7,000 in the late 1990's to below 4,000 in the past decade. The index name no longer reflects its actual constituent number, but rather is an indication of its comprehensiveness.

Inside the Wilshire 5000 series, size segments such as a large cap index and small cap index were also based on a fixed stock count. Given the notable contraction of listed company number in the past two decades, questions are raised as to whether these count-based size indexes and their counterparts are reflective of the market they seek to benchmark. The heart of the problem lies in the drift of their market cap coverage which materially impacts their representativeness. This is well discussed in the research note - **Seeing through the size mirage in US equities.** As a result, the legacy Wilshire 5000 series was modernized and rebranded the FT Wilshire 5000 Index Series in June 2021, with the same broad 5000 index methodology but with the different size indexes based on cumulative market cap coverage. Specifically, the FT Wilshire US Large Cap Index includes companies within the top 85% ranked by full market cap in descending order. In turn, the FT Wilshire US Small Cap Index includes companies within the next 13%. The combination of these two size indexes is named the FT Wilshire 2500 Index, designed to represent the US institutional cap market. The name is symbolic of its comprehensiveness while the actual number of constituents is around 1,800 as of end of September 2022.

The need for a global equity benchmark

The US equity market remains the largest and most influential market across the globe to date. Among the largest equity exchange-traded funds (ETFs) ranked by assets under management (AUM), the largest are still dominated by US funds, be they narrow or broad based, pure market cap or style. As we move down the list, international equity funds start to appear, such as developed market (including or ex-US) and emerging market funds. The international equity markets enrich the opportunity set of the US market by providing the potential for diversification.

Riding on the popularity of passive investment, index coverage on global equity markets has substantially increased. A global equity index can serve as the benchmark for ETFs, index funds or structured products, and also supplies reference points for global asset allocation and rich information for measuring the global economy. For an index provider, besides the benefit of a flagship product, a global equity index also acts as the selection universe and performance benchmark for derived indexes, such as style, risk-weighted, factor-based, sustainable investment, optimized, etc. Clients would not be able to benefit from these investment strategies if the underlying index for the markets of interest is not in place. All these call for a definitive global equity benchmark.

Design considerations

Targeting institutional investors

Asset owners, asset managers and other institutional service providers and investors are the key users of index products. Their regulatory requirements set the tone for global index design.

From a country perspective, a country or market must provide sound investor protection, easy access, sufficient liquidity, and quality market infrastructure for institutional investors to consider inclusion in their portfolio. Within our country classification framework, a country is assigned developed, emerging or unclassified status according to its economic status, the soundness of its legal and regulatory framework, and the quality of their trading, brokage, settlement and custody market infrastructure. Of the market status categories, developed or emerging markets meet the needs of the majority of institutional investors. This means that only countries with developed or emerging market status are considered for inclusion in a global benchmark.

From a listed company perspective, certain size requirements must be met before being considered by institutional investors, along with other eligibility criteria. Within our size segmentation framework, a company is assigned large cap (mega cap plus mid cap), small cap and micro cap. Of the size segment categories, micro cap is generally deemed as too small, less liquid, more volatile, and more costly to be considered as investment opportunity by institutional investors. As a result, micro caps will not be eligible for inclusion in the global benchmark, although they could be provided as stand-alone index.

The conundrum: balancing size integrity and country coverage

Moving from a single market index to a global index, an immediate design problem is the vastly different distributions of company sizes within each country. For example, suppose companies ranked in top 85% within each country are defined as large cap. Based on data as of end of August 2022, the smallest large cap company in the US would be over 17 times larger than that of a large cap company in New Zealand, or over 50 times larger than that in Poland, not to mention other more extreme cases. So, for size segmentation, setting the same percentage cut-off levels for each country can lead to substantial divergence in company sizes within each size segment, even though it achieves the best consistency in terms of country coverage. At the other extreme, one can define a single set of size cut-off levels by ranking all the companies in the global universe in one go (hereinafter referred to as the bottom-up approach). The benefit of doing this is obvious - it achieves the best consistency in terms of company size within each size segment. However, the cost is the nontrivial distortion on country coverage. For example, assume companies ranked in top 85% within the global universe are defined as large cap. Based on data as of end of August 2022, the country coverage of US large cap companies would exceed 94%, while that of Japan large cap companies would be below 77%. Meanwhile, it is unsurprising that the majority of emerging countries have insufficient representation and country coverage since their company sizes are relatively smaller than those in developed countries.

Historically, index providers attempted to target consistent coverage with tweaks to improve size integrity. For instance, MSCI augments single country size cut-off levels (based on percentage coverage, e.g., 70% for large cap, 85% for mid cap and 99% for small cap) with a Global Minimum Size Reference (GMSR) for each size cut-off level. The GMSR is derived from the universe of developed market companies and the GMSR for emerging markets is set at one-half of the developed figures. Then a Global Minimum Size Range is calculated as 0.5 to 1.15 times the GMSR. In addition, for each market, a Market Coverage Target Range is defined as falling within +/-5% of the country coverage levels. The objective is to have the smallest company in each country size segment fall within (or get close to) the Global Minimum Size Range and the Market Coverage Target Range. If both conditions cannot be satisfied, priority is given to the global size integrity. On the other hand, FTSE Russell takes a distinctive approach to balance size integrity and coverage. It groups eligible companies in the global universe into eight geographic regions and calculates size cut-off levels (based on the same set of percentage coverage levels, e.g., 70% for large cap, 90% for mid cap and 98% for small cap) for each regional universe, respectively. Also, there is additional minimum company size requirement (set at 0.04% of regional All-World Index by full market cap) for large/mid cap inclusion in each region. This approach provides size integrity within regions and certain improvement in consistency of country coverage compared with the bottom-up approach.

Different index users hold different opinions towards whether size integrity or consistency in country coverage is more important for a global benchmark. Although there is no one-size-fits-all solution, it is our objective to seek better trade-off between global size integrity and consistent country coverage.

Incorporating the US size indexes as the US component

Representing the US institutional cap market, the FT Wilshire US Large Cap Index and FT Wilshire US Small Cap Index are the ideal candidates for the US component of the global index designed for institutional investors. The two US size indexes capture the respective size segments in a robust way with cumulative market cap coverage. From a user perspective, a global index with the two US size indexes as the US component leads to cost saving and greater operation efficiency should the user have both US and global mandates.

While the intended incorporation of the two US size indexes in the global index provides synergy, it results in profound implications for the index design. For example, the nationality assignment rules should be followed by the global index to avoid potential discrepancies on US companies. But most importantly, it suggests a country-by-country construction approach rather than a bottom-up approach. This does not mean the bottom-up approach is completely disregarded. In fact, it can be used to provide reference points towards global size integrity, as revealed in the next section.

Resolving the conundrum - our methodology solution

Consistent target coverage within developed countries

Since the global index design opts for a country-by-country approach and the US component is the largest and already well designed, it is logical to apply the same methodology, in particular the percentage cut-off levels for size segmentation (i.e., 70% for mega cap, 85% for mid cap and 98% for small cap), to all the rest developed countries.

By doing so, consistent country coverage is immediately achieved within developed markets. Do we then get size integrity? To a large extent yes, but not exactly. We see most developed countries are comparable in terms of company size at a given cumulative market cap coverage. Yet there are a few countries with relatively small companies in the lower end of their ranked list, such as New Zealand and Israel. Thus, targeting consistent coverage within developed countries calls for moderate calibration to further improve size integrity.

Consistent and shifted target coverage within emerging countries

When it comes to emerging countries, the first attempt is to apply the same percentage cut-off levels to each country as is done for developed countries and observe the results. It is unsurprising the smallest companies within each size segment are considerably smaller than their counterparts in developed countries on average. Consequently, targeting the same percentage cut-off levels for emerging countries as developed countries would sacrifice size integrity in the global index. As a remedy the bottom-up approach is referenced. To illustrate, companies in the global universe, including developed and emerging countries, are ranked by full market cap in descending order and their cumulative full market cap coverage is calculated. Then the size of the smallest company ranked within 98% is marked as the cut-off level for all cap. This is a combination of large cap and small cap. With this cut-off level, the country coverage for each emerging country can be calculated. The analysis indicates that the resulting emerging country coverage is approximately 5% less than the target 98% on an average basis. Therefore, it is necessary to shift the target coverage within emerging countries to pursue size integrity in the global index. Effectively, every percentage cut-off level is shifted up by 5% (65% for mega cap, 80% for mid cap and 93% for small cap) for each emerging country. With this shift we are closer to global size integrity, but further calibration is needed.

Minimum company size requirement for the global large cap segment

After defining the target coverage for developed and emerging countries, the next step is to enhance size integrity within respective size segments. Here we focus on the global large cap segment since it is the core of institutional portfolios. A minimum company size requirement (as measured by a company's full market cap) sounds like an ideal way to achieve global size integrity in the large cap segment. The challenge is how the level should be determined so as to be effective but without distorting the target country coverage. The bottom-up approach comes into play again. Specifically, the size of the smallest company in the large cap segment in a global bottom-up index (where large cap covers top 85% with buffer) provides a meaningful guideline on the minimum company size threshold. A robust estimate of this minimum company size threshold translates as 0.25 of a basis point of the aggregate full market cap of all the companies in the global universe.

The minimum company size requirement acts as an adjustment on the size cut-off levels for the large cap segment where needed. For instance, based on data as of end of August 2022, the size cut-off level for Japan large caps needs to be adjusted up and consequently its large cap coverage is reduced by 3% (from 85% to 82%). On the other hand, historically the country coverage of US large caps is not affected (its stays at 85%) since the original size cut-off levels for US large caps are always above the corresponding minimum company size thresholds.

Minimum index weight requirement for the global all cap index

For a diversified portfolio, stocks with miniscule weights have trivial contributions on the portfolio characteristics (such as performance, risk and valuation). On the other hand, they incur additional operation costs on a full replication strategy. A minimum index weight constraint can prevent stocks with tiny weights from inclusion. Unfortunately, there is no golden rule for the determination of the minimum weight threshold. Based on the methodology solution laid out so far, stocks with very small weights are mostly seen in emerging markets (due to their smaller sizes, lower free float, partial inclusion, etc.). As a rule of thumb, a minimum weight threshold of 0.5 of a basis point is set for emerging markets. Since emerging markets roughly take up 10% of the global markets by index weight, a minimum weight of 0.05 of a basis point becomes the requirement for the global all cap index. It is worth noting that the minimum index weight requirement also helps improve size integrity in the small cap segment.

An overview of the FT Wilshire Global Equity Market Series construction process

We now put the above design elements into context and depict the whole picture of the global benchmark, the FT Wilshire Global Equity Market Series (GEMS).

The construction process starts with country classification as previously mentioned. Countries with developed or emerging market status are eligible for inclusion in GEMS. The classification of countries is reviewed annually.

Within each eligible country, it specifies eligible exchanges, market segments and security types (in general common equity and preferred shares).

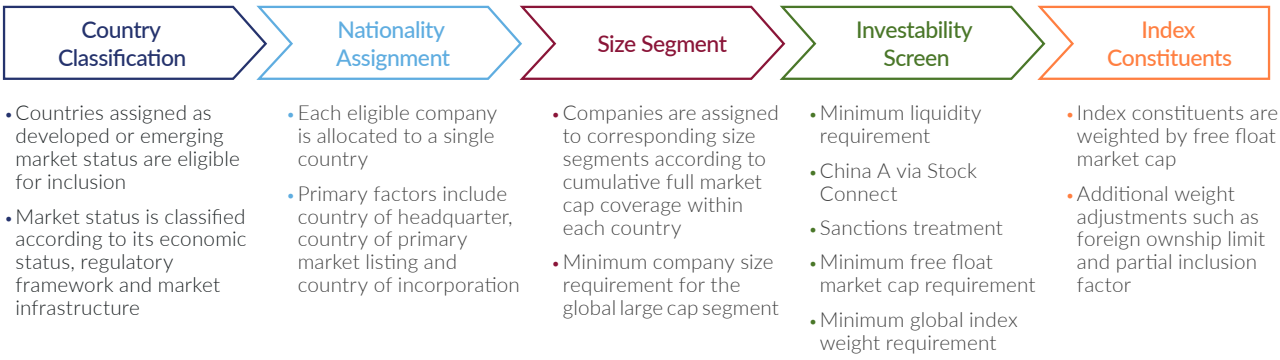
Then each eligible company is assigned to a single country based on several factors, primarily the country of headquarters, country of primary market listing and country of incorporation. If all three countries match, the company is assigned to that country. Companies which are not easily assigned to a country will then be analyzed on case-by-case basis. If the three factors do not lead to a conclusive decision, additional factors will be considered, such as location of management, location of listings and location of production assets.

Within each country universe, companies are ranked by full market cap in descending order and assigned to corresponding size segments based on cumulative market cap coverage. For a developed country, the market cap bands are set to top 70% for mega cap, next 15% for mid cap, and next 13% for small cap. For an emerging country, the market cap bands are set to top 65% for mega cap, next 15% for mid cap, and next 13% for small cap. Meanwhile, the mega cap and mid cap companies assigned by the market cap bands need to meet the additional minimum company size requirement; otherwise, they will be allocated to small cap. The minimum company size is set at 0.25 of a basis point of the aggregate full market cap of all eligible companies in the global universe.

Following size segmentation, investability screens are applied to all mega cap, mid cap and small cap securities. These include, but are not limited to, minimum free float market cap requirement, minimum liquidity requirement, China A Shares accessibility via Stock Connect, sanctions treatment, and minimum global index weight requirement.

Finally, the remaining eligible securities constitute the global index and are weighted by free float market cap with necessary adjustments (such as foreign ownership limit and partial inclusion factor).

GEMS's construction process is summarized in the figure below.



GEMS has an inception date of 24 March 1997. In subsequent semi-annual reconstitutions, buffer rules (e.g., on size cut-off levels, free float market cap and liquidity thresholds) are applies to improve index stability.

Fulfilling the five key requirements of a global equity benchmark

1. Comprehensive

GEMS aims to provide a comprehensive benchmark for the global investable equity markets. After the September 2022 semi-annual reconstitution, the FT Wilshire Global All Cap Index (the ultimate parent index in the series) covers 8,010 securities across 48 developed and emerging countries.

The table below compares the constituent characteristics of the all cap, large cap and small cap indexes.

	FT Wilshire Global All Cap Index	FT Wilshire Global Large Cap Index	FT Wilshire Global Small Cap Index
No. of constituents	8,010	3,114	4,896
Index market cap	62,537,111	55,066,386	7,470,725
Average market cap	7,807	17,683	1,526
Median market cap	1,327	3,937	728
Largest weight (%)	3.87	4.40	0.24
Top 10 weight (%)	14.30	16.24	2.11

Source: Wilshire. Data as of at 19 September 2022. Market cap is in millions of US dollar.

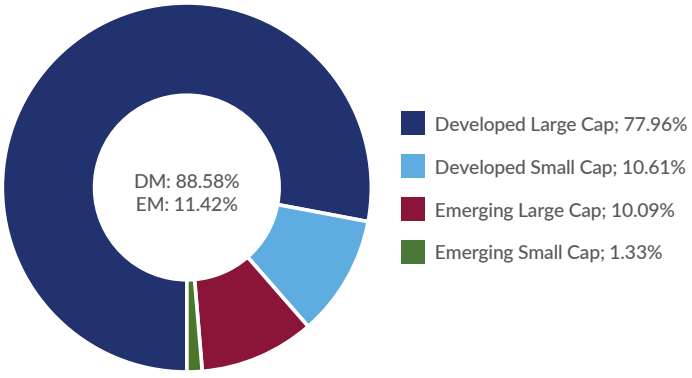
The index market cap provides useful information when evaluating the market cap coverage. However, it can be distorted by the extent to which providers differ in its calculation (primarily regarding free float). Therefore, we also look at the security full market cap (i.e., shares times price) for a more informative view. Within the global universe for the 19 September 2022 reconstitution, the FT Wilshire Global All Cap Index covers 89.42% by security full market cap. Albeit a one-day snapshot, it is evident that GEMS is the comprehensive benchmark it is designed to be.

2. Representative

It is crucial for the composition of a global equity benchmark to be representative since it is often taken as the reference point for asset allocation decisions.

The figure on the right shows the component weights of the FT Wilshire Global All Cap Index by region and size. They are comparable with their counterparts from other major index providers.

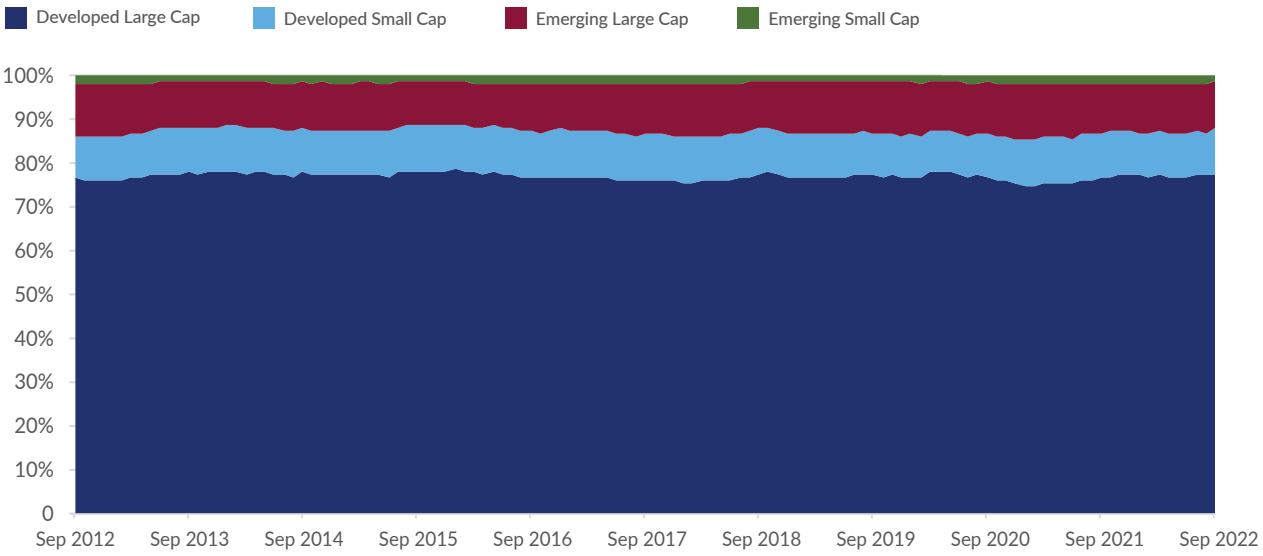
FT Wilshire Global All Cap Index



Source: Wilshire. Data as of at 19 September 2022.

The region and size components exhibit stable weightings in the FT Wilshire Global All Cap Index during the past ten years as indicated in the figure below.

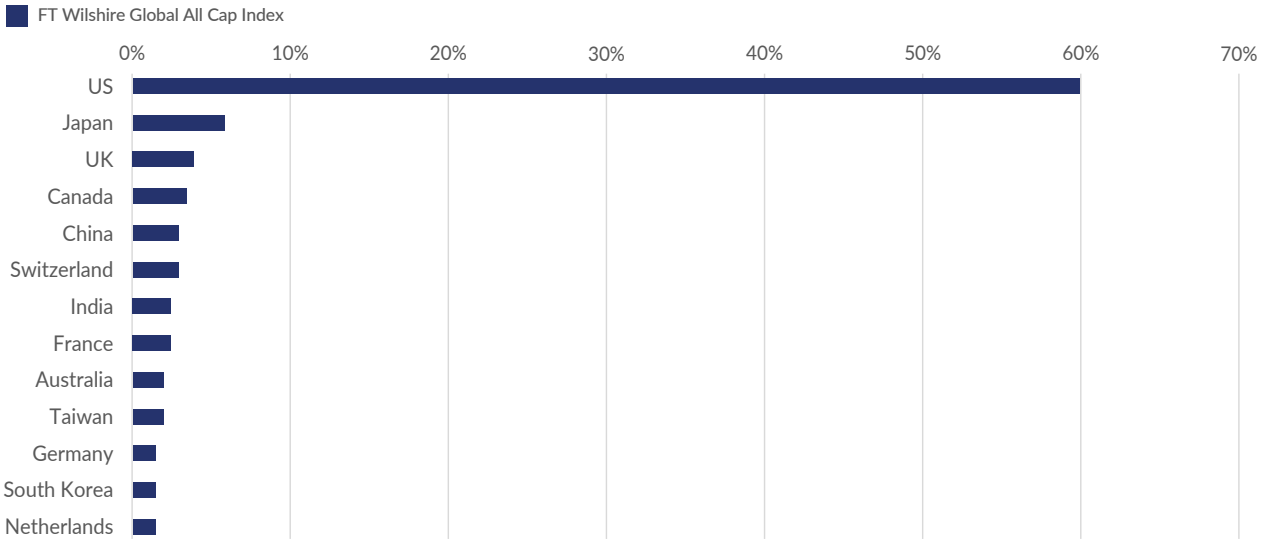
FT Wilshire Global All Cap Index Composition



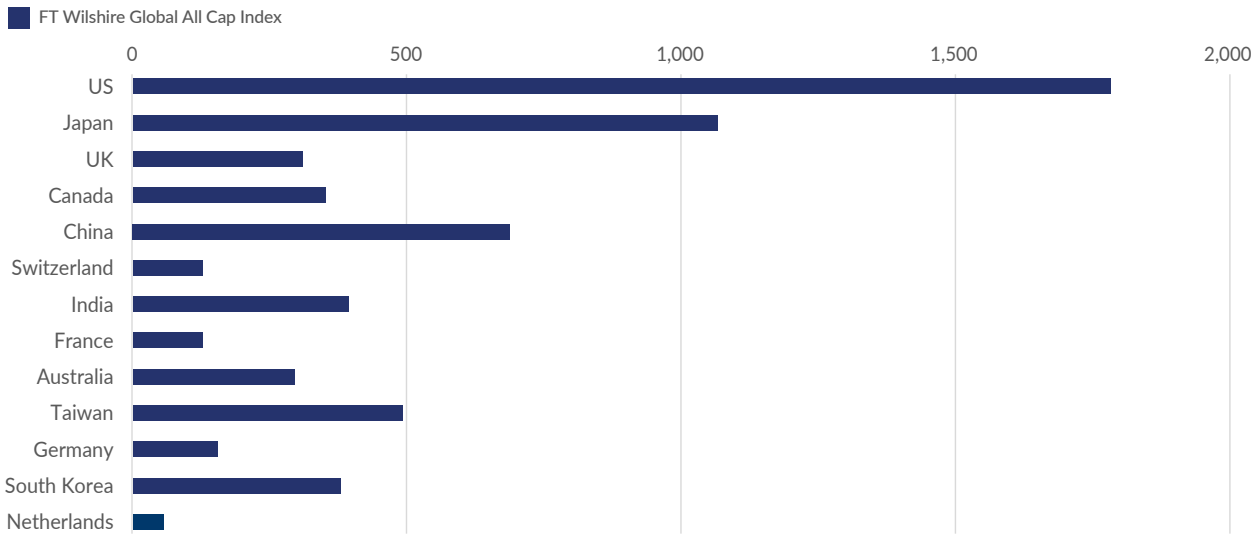
Source: Wilshire. Month end data from September 2012 to September 2022.

Besides region, country composition is another important element to evaluate the representativeness of a global equity benchmark. The figures below show the weights and constituent numbers of selected countries in the FT Wilshire Global All Cap Index.

Global All Cap Country Weights



Global All Cap Country Constituent Number



Source: Wilshire. Data as at 19 September 2022. Countries shown are those with weight above 1% in the FT Wilshire Global All Cap Index

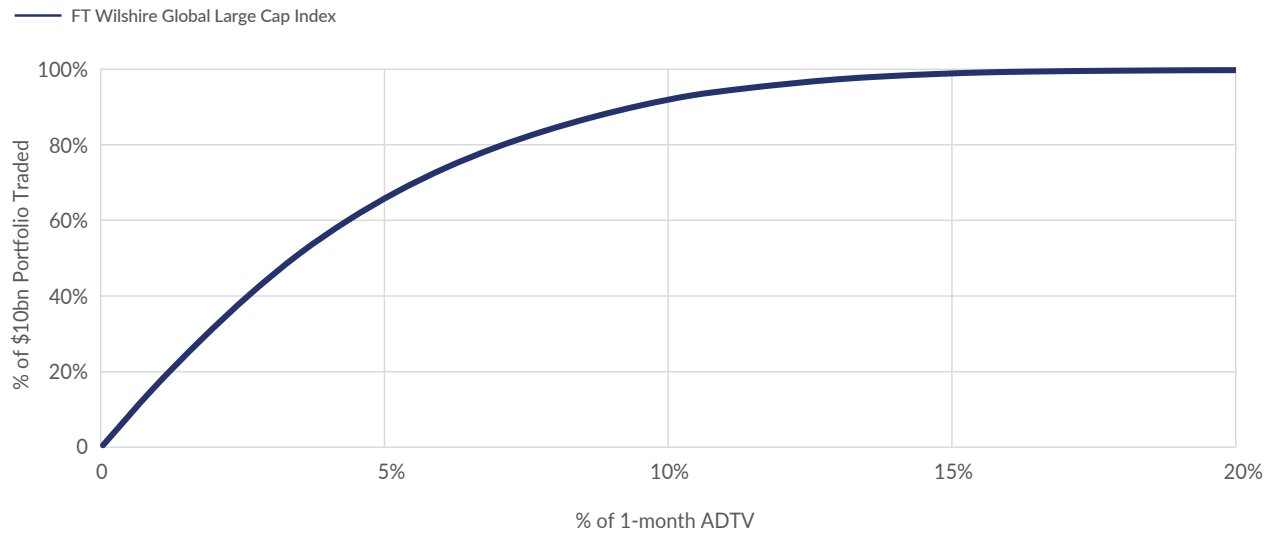
The country weights are close to their counterparts from major index providers. Nevertheless, there are a few countries with nontrivial constituent number differences. Most can be explained by our intention to achieve less deviation from the target coverage. A less influential factor is the discrepancy in nationality assignment. Another factor to consider is the minimum weight constraint. For example, China we include fewer China A Shares arising from the joint effect of partial inclusion and minimum weight requirement. In the future this situation is likely to change when the inclusion factor is increased.

Despite these differences, comparisons suggest GEMS is representative in terms of region, country and size compositions.

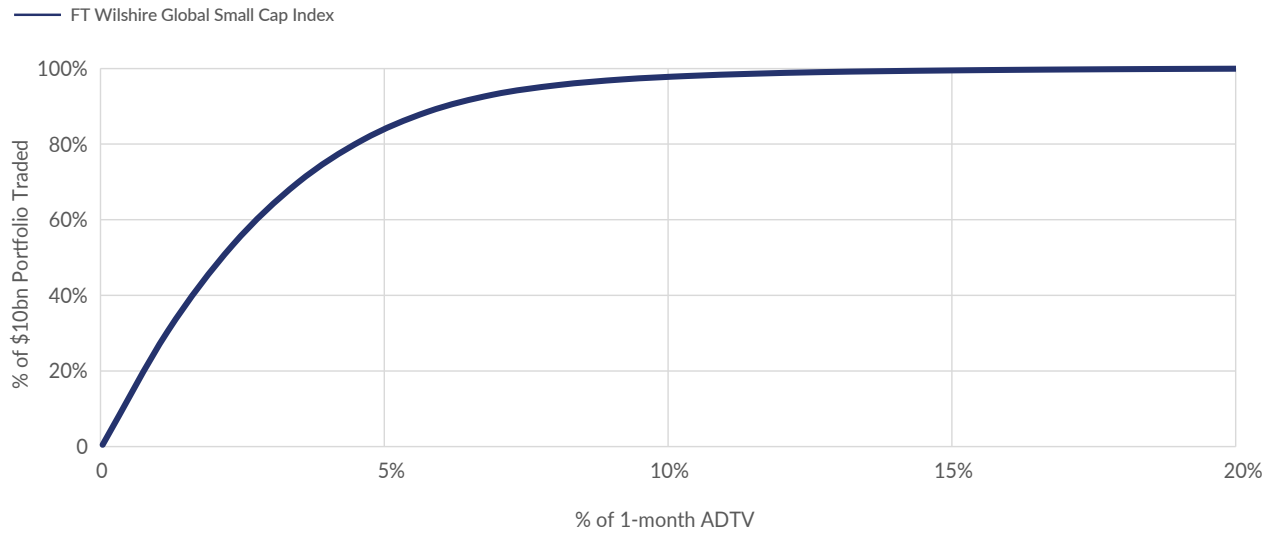
3. Investability

As an assessment of investability, the figures below visualize the liquidity of GEMS, by calculating the percentages of an index portfolio that can be implemented at growing percentages of the average daily traded value (ADTV) of its constituent stocks.
The AUM assumption is US$10bn for the global large cap and US$1bn for the global small cap.

Global Large Cap Index Liquidity



Global Small Cap Index Liquidity



Source: Wilshire. Data as at 19 September 2022.

The results suggest both the index portfolios can be implemented within 20% of each constituent's 1-month ADTV under their respective AUM assumptions.

4. Transparency

The highly transparent nature of GEMS is deeply rooted in its intuitive construction methodology.

For each eligible country the index construction starts with a single equity universe. It is comprised of all securities assigned to that country with eligible types. The cumulative market cap coverage is calculated against this universe, without the complexity introduced by upfront truncation or investability screens.

In size segmentation, there is one set of target market coverage levels for each developed country and another set for each emerging country. The target market coverage levels for emerging countries are shifted up by 5% relative to those for developed countries with the sole purpose of pursuing global size integrity. The minimum company size requirement is introduced as a further calibration on the size integrity between the large cap and small cap segments. The threshold is derived from the global universe (i.e., the combination of all country universes) and applied universally to all countries. It is worth noting that the minimum company size requirement only adjusts the large cap coverage upwards (but not downwards) where necessary. This approach leads to less deviation from the target market cap coverage levels.

Investability screens are applied after size segmentation. They are designed to be pragmatic and robust. For each security, most of the screens are individually applied. The only exception is the minimum index weight requirement which is derived from the remaining securities after all other investability screens have been implemented.

The methodology also provides clarity and certainty regarding the schedules for semi-annual reconstitutions, quarterly reviews, as well as daily maintenance.

5. Modular design

GEMS follows a strict country-by-country construction approach, with no mix of countries and regions. The country indexes are the building blocks of the global index. This modular design empowers users of GEMS as it is highly flexible and can meet various requirements. From the FT Wilshire Global All Cap Index, the ultimate parent index, the series could provide a variety of meaningful carve-outs, e.g. by size segment (such as large cap and small cap), market status (including developed and emerging), geographical region (such as North America, Europe, Asia Pacific, etc.), industry classification, and combinations of the above (like Developed ex US and Emerging Asia Pacific). Along with individual country indexes, the series provides a strong set of index offerings to the investment community.

In addition, many country indexes within GEMS resemble their domestic compositions that would be constructed from a standalone country perspective. This results from the effort of seeking a better trade-off between country market cap coverage and global size integrity. An obvious example is the US portion as it is represented by the FT Wilshire US Large Cap and the FT Wilshire US Small Cap indexes. Among other significantly weighted countries, the UK and Switzerland also closely mimic their domestic versions. This additional benefit could potentially provide more synergy to users in certain countries with both domestic and global mandates.

Conclusion

The FT Wilshire Global Equity Market Series is built upon a consistent country-by-country framework and aims to provide a comprehensive measure of the global equity markets with greater precision and transparency. It is designed to be representative and investable. Through an intuitive construction approach, it seeks a better trade-off between country market cap coverage and global size integrity, compared with other legacy products. With its modular-based methodology, the series offers a strong set of meaningful benchmarks for various investment scopes, such as global, regional, country or sector-focused.

There is a continuing demand for new indexes and benchmarks to support the growth in passive investment and the need for deeper understanding of market risks and trends. Being a pioneer in the index industry, Wilshire is committed to index innovation, modernization and reshaping the index industry to improve investor outcomes. The launch of the FT Wilshire Global Equity Market Series demonstrates Wilshire's commitment to satisfy the evolving requirement of index users.

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