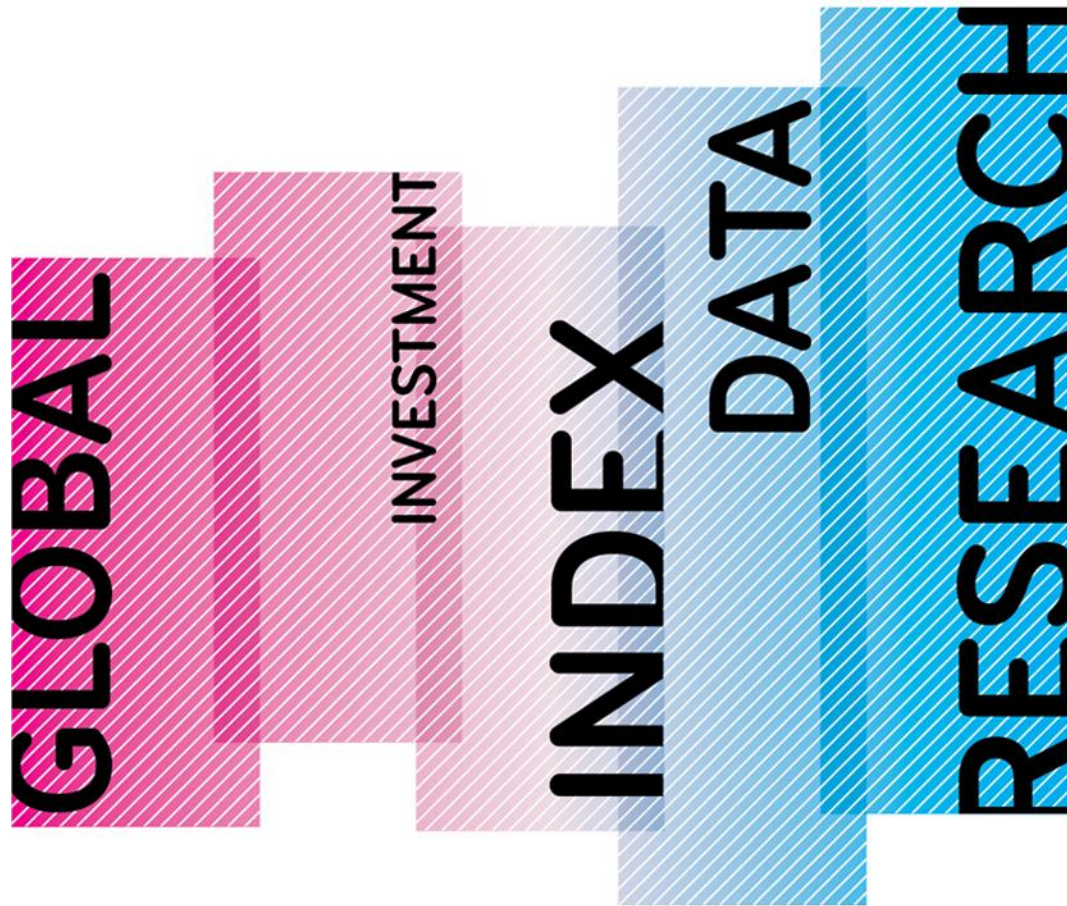


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GAINING ACCESS TO THE EUROPEAN EQUITY MARKET: STOXX EUROPE 600

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TABLE OF CONTENTS

Introduct ion	3
Regional coverage	3
Market coverage and tradability	3
Size and performance	5
Country and industry allocation	8
Market valuation	12
Conclusion	13
Appendix	14

Introduction

With Europe's economy starting to stabilize, and the expectation of continued growth, the attractiveness of European markets has significantly increased in recent years. Investors may want to look to pan-European indices to allocate capital. This paper introduces the STOXX Europe 600 index as a broad, yet tradable representation of the European equity market. The comprehensive coverage of the index provides investors with a country and industry allocation that is very similar to that of the underlying total market. By extending its reach beyond mere large-cap stocks, the STOXX Europe 600 profits from the relative outperformance of mid- and small-caps - an observation that was characteristic of the developed European equity market for most of the last decade.

Regional coverage

The European equity market is highly capitalized with 9.3 trillion US dollars in free-float market cap¹. STOXX currently covers 36 European equity markets, of which 18 countries account for about 96% of the overall market cap and are classified as developed markets. Four countries are classified as emerging markets². The STOXX Europe 600 is a developed market index. Companies locally listed in the following markets are eligible for inclusion: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK.

FIGURE 1: EUROPEAN COUNTRIES CLASSIFIED AS DEVELOPED MARKETS BY STOXX

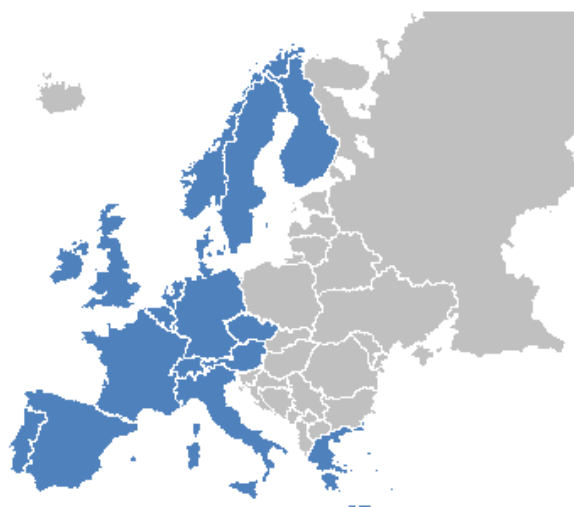


Illustration: STOXX

Market coverage and tradability

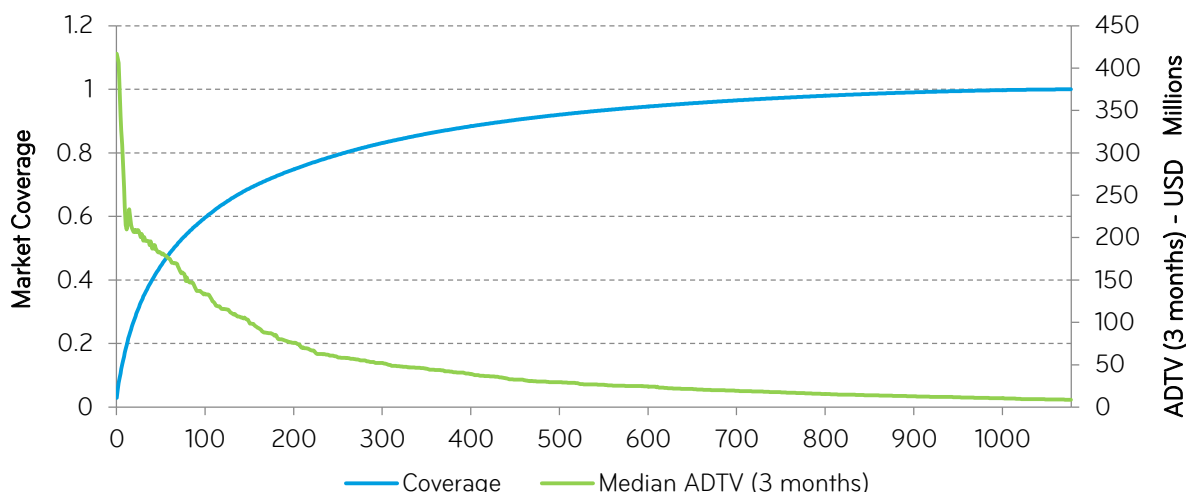
Equity markets typically display a positive relationship between company size and the liquidity or turnover of the company's shares. Increasing market coverage by adding more and smaller stocks to a portfolio therefore decreases the overall tradability of an equity index. Figure 2 displays this negative relation between market coverage and the resulting portfolio's median 3-month average daily traded value (3m ADTV) for the developed equity market.

¹ Source: STOXX Europe Total Market Index (TMI). Date: As of Jan. 30, 2015

² Fourteen countries do not classify as either developed or emerging markets. This can be explained either by low market development or by a lack of data availability required by STOXX for country classification.

As many investors are subject to minimum liquidity thresholds, market coverage should therefore be determined as a tradeoff between tradability and representation.

FIGURE 2: RELATIONSHIP BETWEEN THE COVERAGE OF THE EUROPEAN EQUITY MARKET AND THE MEDIAN 3M ADTV OF THE RESULTING PORTFOLIO



Source: STOXX. The STOXX Europe Total Market Index (TMI), which itself covers 95% of the investable European free-float market cap, is set to represent 100%. Date: Jun. 30, 2016

STOXX offers a broad range of indices covering the developed European equity market. The STOXX Europe TMI represents the broadest index with a targeted coverage of 95%. The index includes as many as 1,070 constituents³. But, as pointed out, such a broad exposure is very hard to trade. The least liquid component in the TMI only trades at an ADTV of 6,621 US dollars.

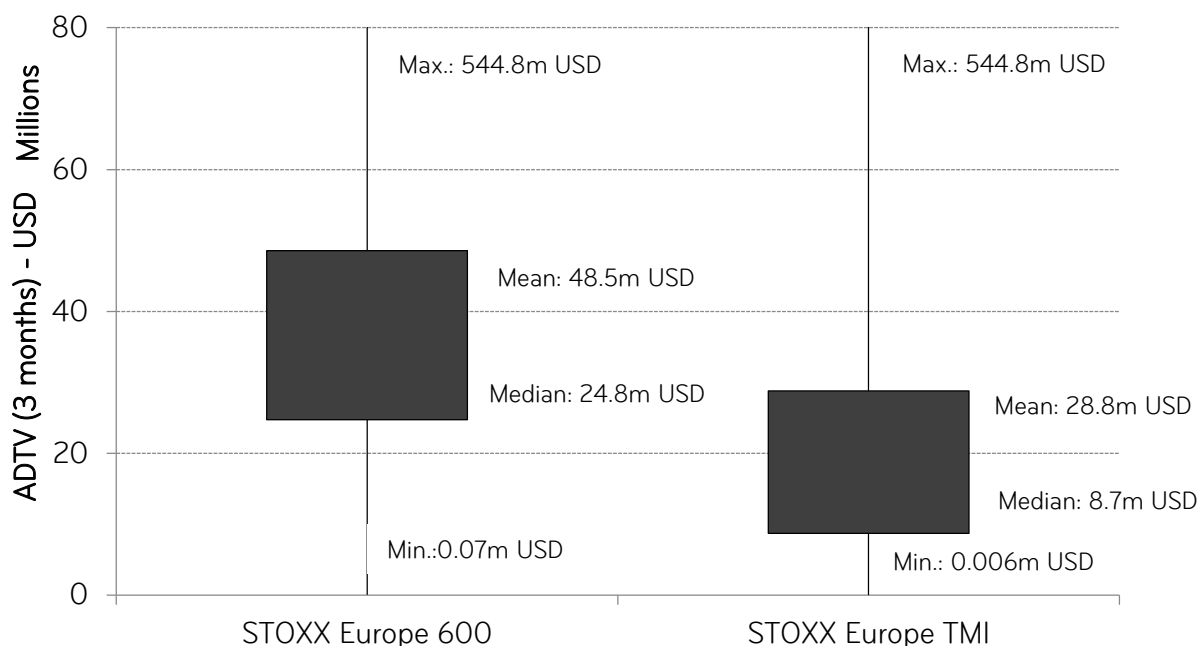
To overcome the tradability issue, the number of constituents needs to be restricted with a focus on shares that have larger capitalizations and are more liquid. With the introduction of the STOXX Europe 600 in 1998, STOXX offers a broad, yet highly tradable access to the European equity market. With 600 stocks, the index covers approximately 93% of the STOXX Europe TMI, or roughly 88% of the total market.

Given the occurrence of rare but existing mismatches between company size and liquidity, it is strongly advisable to further introduce a minimum ADTV on constituent level. To avoid a decrease in tradability due to illiquid outliers among the largest 600 stocks of the developed European equity market, a minimum liquidity threshold of 1 million euros on constituent level is introduced.

The focus on larger capitalized stocks as well as the introduction of a minimum liquidity threshold significantly improves the tradability of the STOXX Europe 600 compared to the STOXX Europe TMI (see Figure 3). While the mean ADTV increases from 28.8 million US dollars to 48.6 million US dollars, the median ADTV increases by as much as 184% to 24.7 million US dollars from 8.7 million US dollars.

³ Date: Jan. 30, 2015.

FIGURE 3: COMPARISON OF THE CHARACTERISTICS (MINIMUM, MAXIMUM, MEDIAN AND MEAN) OF THE LIQUIDITY DISTRIBUTION OF THE STOXX EUROPE 600 AND STOXX EUROPE TMI



Source: STOXX. Liquidity figures are calculated as 3m ADTV in USD. Date: Jun. 30, 2016

Size and performance

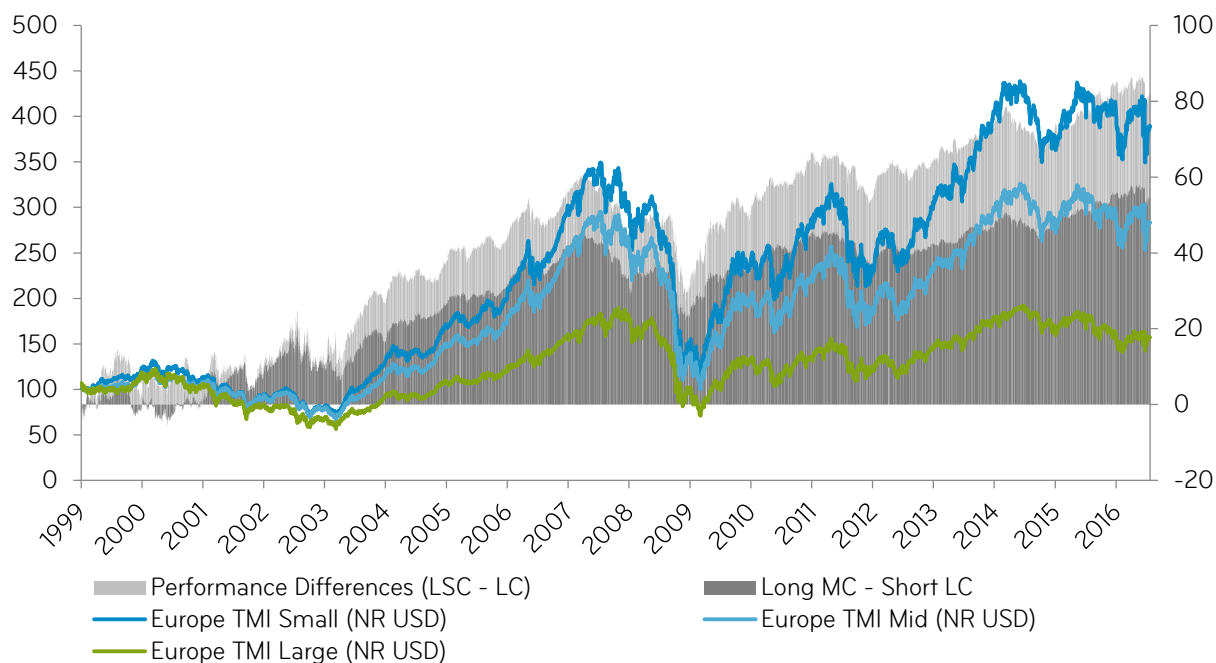
While tradability is important from a replication perspective, investors should primarily be interested in the risk-return characteristics of the resulting index.

Over the last decade, the European equity market was characterized by significant performance differentials among size segments. More precisely, performance was, in certain market environments, highly negatively correlated with size.

Figure 4 displays these performance differentials, calculated as the compounded value of a daily rebalanced long-short strategy, for three size segments: European large caps, mid caps and small caps between 1999 and 2015. Large caps are represented by the STOXX Europe TMI Large, an index that consists of the largest capitalized European companies and covers about 75% of the European market cap. Mid caps, represented by the STOXX Europe TMI Mid, cover the next largest constituents and aim to bring up the coverage of large- and mid-cap stocks to 90%. The STOXX TMI Small Index adds another 5% to overall market coverage.

Mid and small caps significantly outperformed European large caps over the last decade. However, a closer examination reveals that relative outperformance has, in fact, been market cycle dependent (see Figure 4). Most of the overall outperformance has been accumulated by more pronounced capital gains in bull markets while small and mid caps underperformed large caps in bear market phases such as in 2008 and 2011.

FIGURE 4: ANNUALIZED PERFORMANCE AND RISK FIGURES FOR THE STOXX EUROPE LARGE 200, STOXX EUROPE MID 200 AND STOXX EUROPE SMALL 200 INDICES

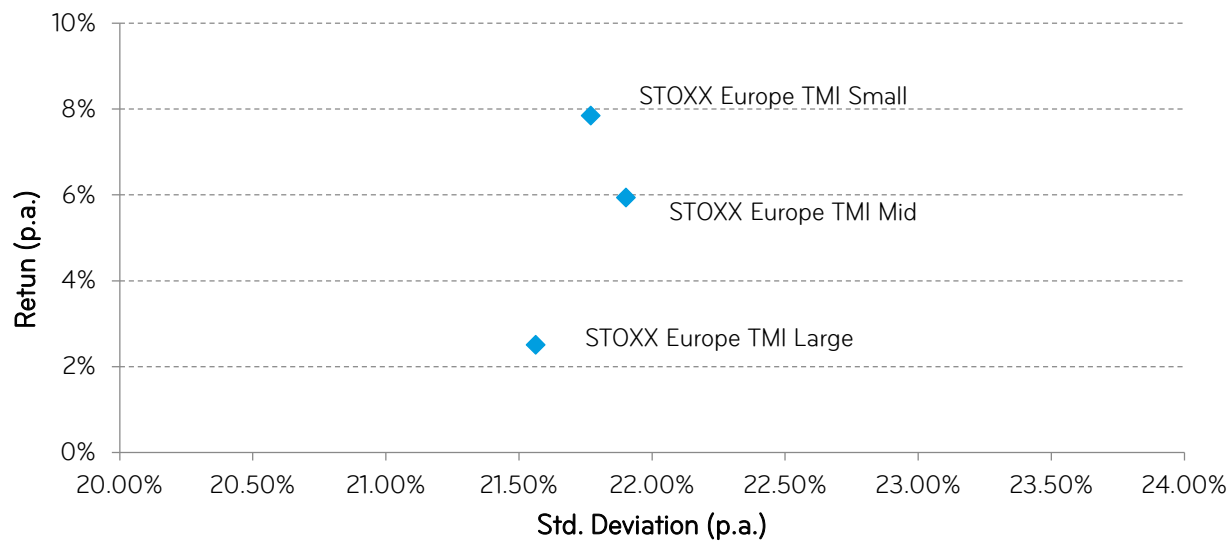


Source: STOXX data from Jan. 4, 1999 to Jun. 30, 2016 for USD NR indices

Over the entire time period observed, small caps generated an annualized performance of about 7.8%, outperforming mid caps by almost 2 percentage points and large caps by over 5 percentage points (see Figure 5).

Since volatility levels are very similar, the negative relation between return and company size is mainly supported on a risk-adjusted basis.

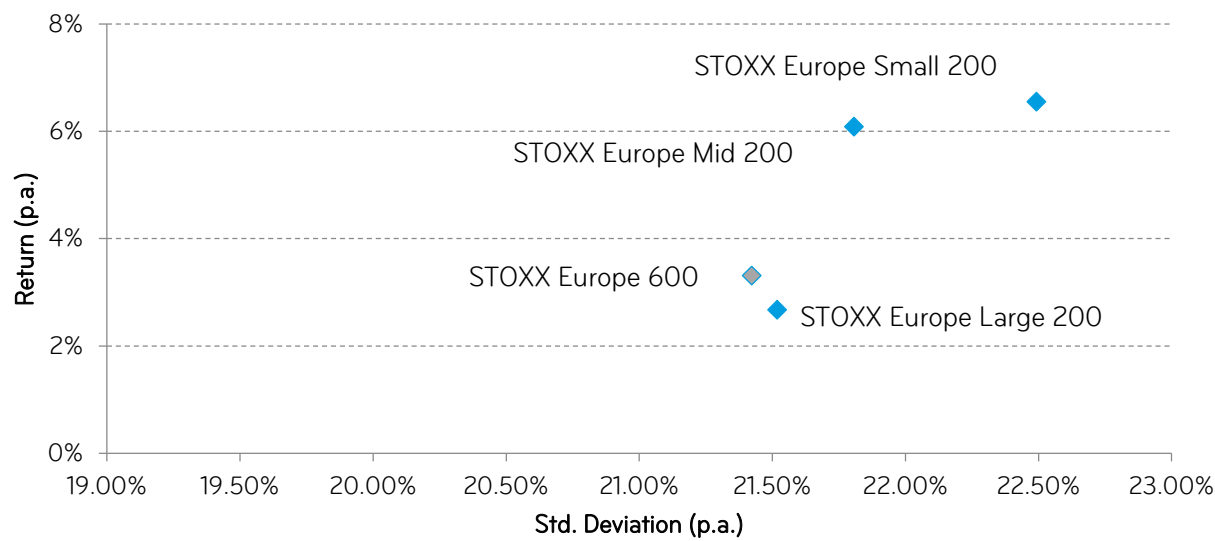
FIGURE 5: ANNUALIZED PERFORMANCE AND RISK FIGURES FOR THE STOXX EUROPE TMI LARGE, STOXX EUROPE TMI MID AND STOXX EUROPE TMI SMALL INDICES



Source: STOXX data from Jan. 1999 to Jun. 2016 for USD NR indices

This negative relationship is not only present on a total market level, but it is also observable within the composition of the STOXX Europe 600 Index. As displayed in Figure 6, a simple division of the index into three sub-indices according to size – each equal in its number of components: 200 – provides very similar results.

FIGURE 6: ANNUALIZED PERFORMANCE AND RISK FIGURES FOR THE STOXX EUROPE LARGE 200, STOXX EUROPE MID 200 AND STOXX EUROPE SMALL 200 INDICES



Source: STOXX data from Jan. 1999 to Jun. 2016 for USD NR indices

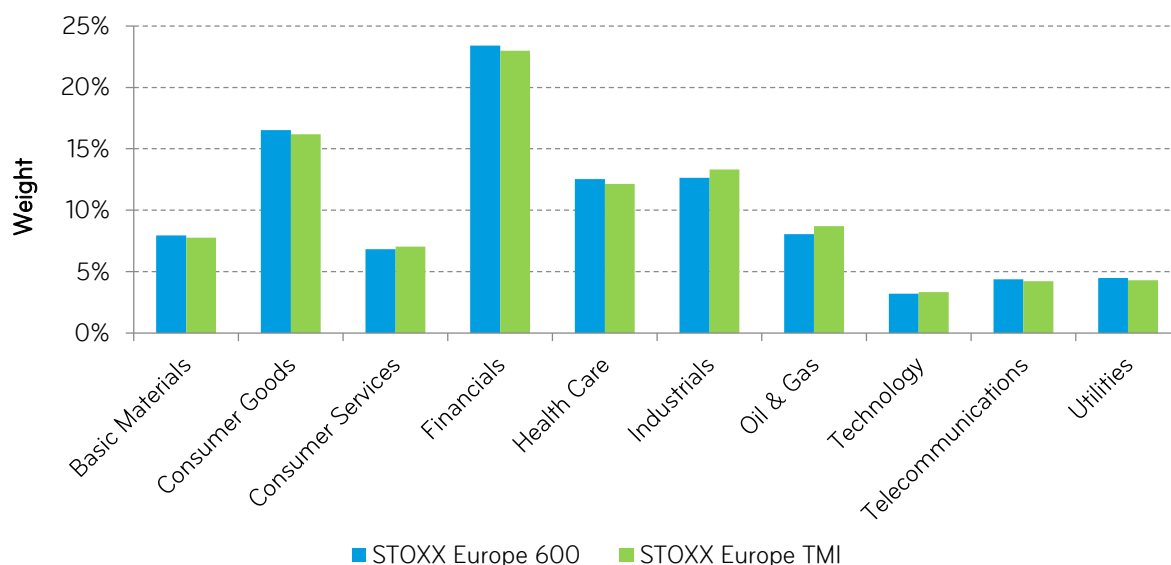
This differentiated view on the STOXX Europe 600 thus explains the index's outperformance compared to a focus only on large-cap stocks, such as the STOXX Europe Large 200. The addition of mid- and small-cap stocks increased the annualized index performance by 0.6 percentage points or 24%.

Country and industry allocation

European countries as well as industries displayed diverse risk and return characteristics over the last decade. Therefore, it is important to understand allocations within the STOXX Europe 600 to assess the underlying performance drivers.

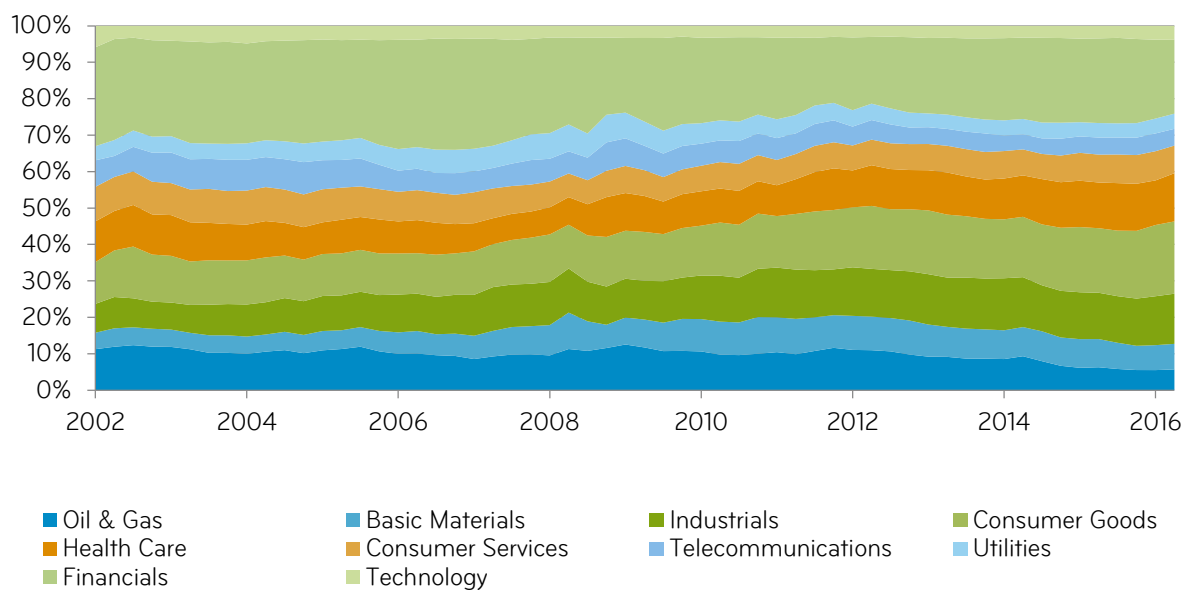
Figure 7 provides the industry allocation for the STOXX Europe 600 and the overall developed European equity market, represented by the STOXX Europe TMI. Both indices are well diversified across all 10 ICB industries with Financials and Consumer Goods being the largest industries. The similarity of the two concepts underscores the representativeness of the STOXX Europe 600 for the developed European total market.

FIGURE 7: ICB INDUSTRY ALLOCATION OF STOXX EUROPE 600 AND STOXX EUROPE TMI



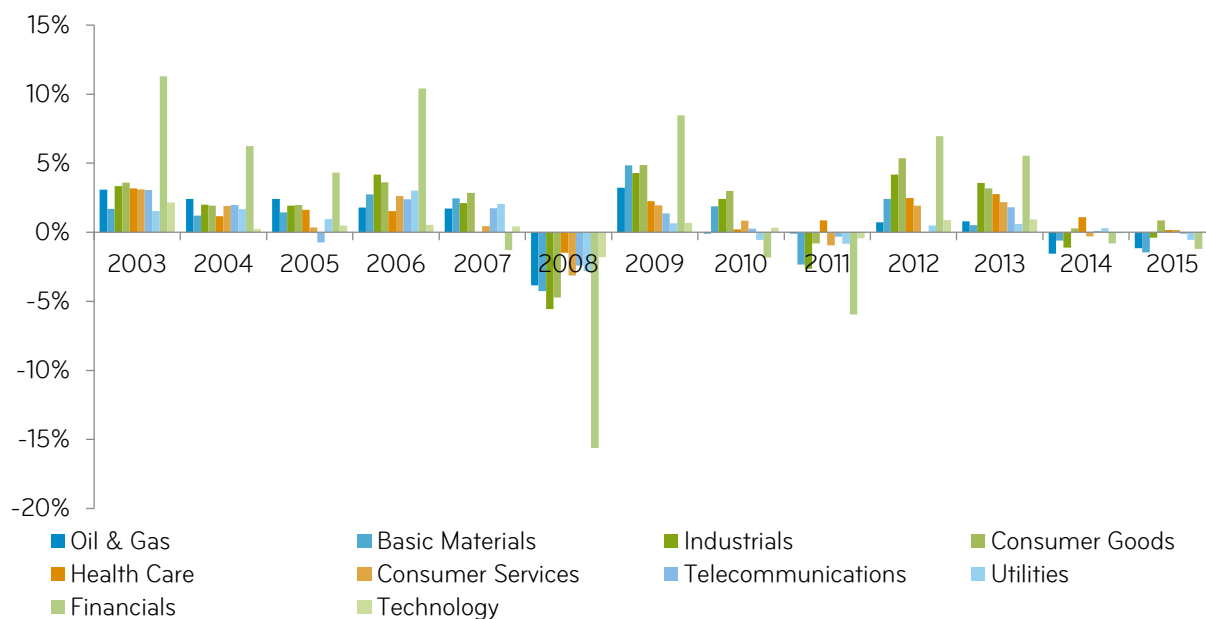
Source: STOXX data as of Jun. 30, 2016

An analysis of the development of the industry allocation over time reveals interesting shifts. While the weight of the Financials industry significantly decreased by 9.7 percentage points in the wake of the financial and European crisis, the industry groups Consumer Goods and Health Care, on the other hand, gained the most with 8.5 and 4.6 percentage points since 2006, respectively (see Figure 8).

FIGURE 8: ICB INDUSTRY ALLOCATION OF STOXX EUROPE TMI

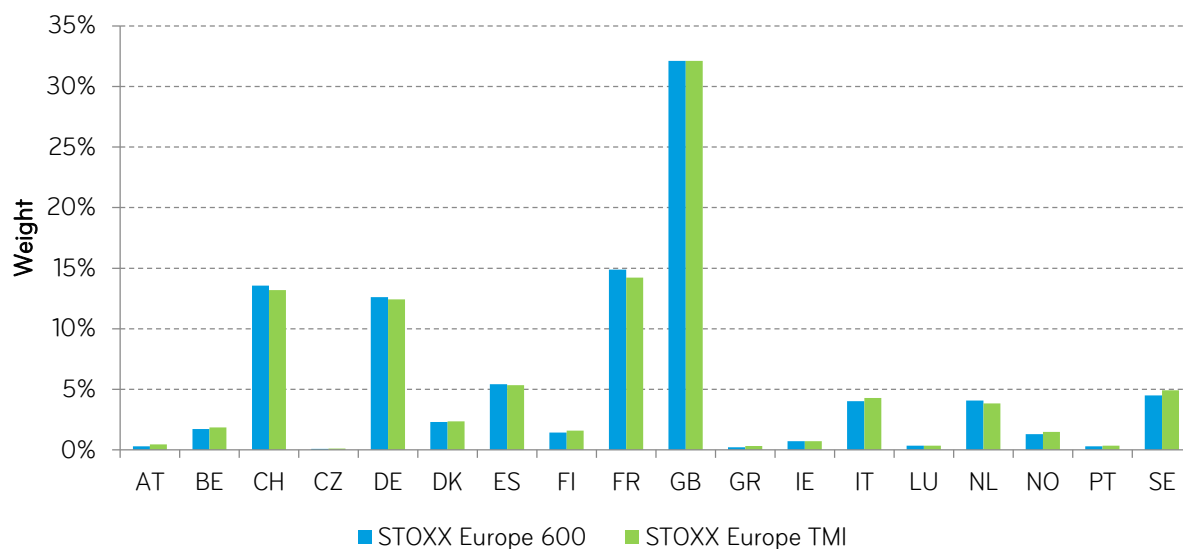
Source: STOXX data from Mar. 18, 2002 to Jun. 17, 2016

These reallocations lead to the question of how industries influenced the index's performance over time. Figure 9 displays the performance contribution of the 10 ICB industries to the STOXX Europe 600 over the last 14 years. It shows that the Financials sector dominated the performance of the index. While it massively contributed to the index's positive returns in the pre- and post-crises period, it also drove drawdowns in the financial crisis in 2008 and the European crisis in 2010 and 2011. The performance contribution of the remaining industries has been much less pronounced and was mainly homogenous in direction.

FIGURE 9: PERFORMANCE CONTRIBUTION OF ICB INDUSTRIES TO PERFORMANCE OF STOXX EUROPE 600

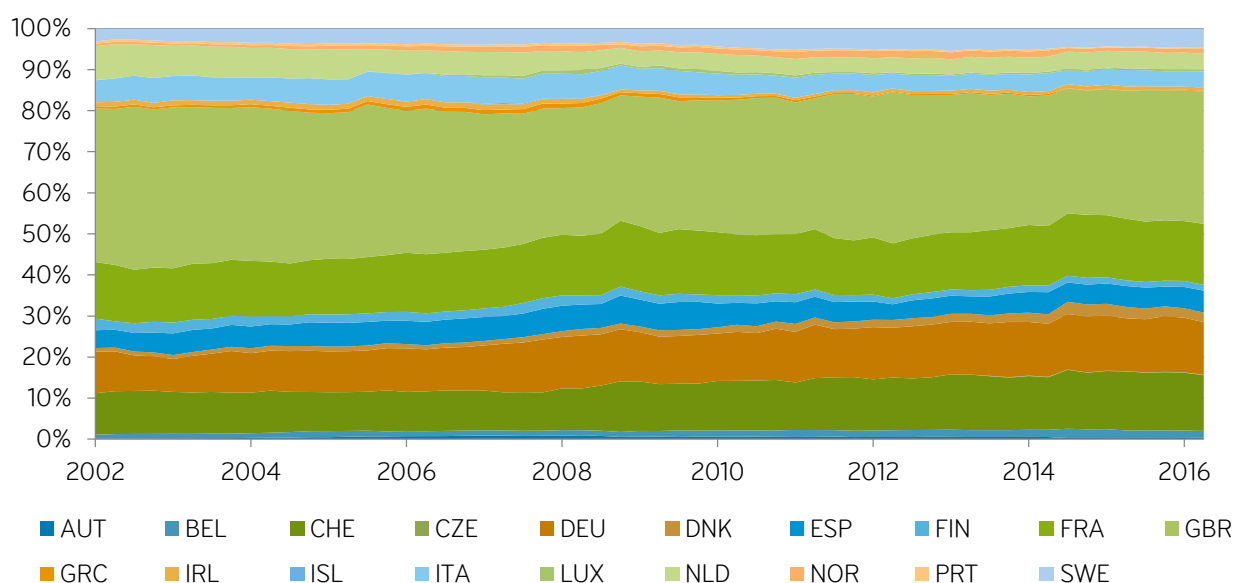
Source: STOXX data from Jun. 2003 to Dec. 2015

The country allocation of the STOXX Europe 600 is also very similar to that of the STOXX Europe TMI. Both indices display equally high weights in the four major economies: UK, France, Switzerland and Germany (see Figure 10).

FIGURE 10: COUNTRY ALLOCATION OF STOXX EUROPE 600 AND STOXX EUROPE TMI

Source: STOXX data as of Jun. 30, 2016

But similar to industry allocations, country allocations have also been subject to changes over time. While the weights of the UK and the Netherlands decreased the most with 5.2 and 4.4 percentage points, respectively, since the beginning of the observation period in 2002, the weights of Switzerland and Germany, on the other hand, displayed the highest increases with 3.4 and 2.7 percentage points (see Figure 11).

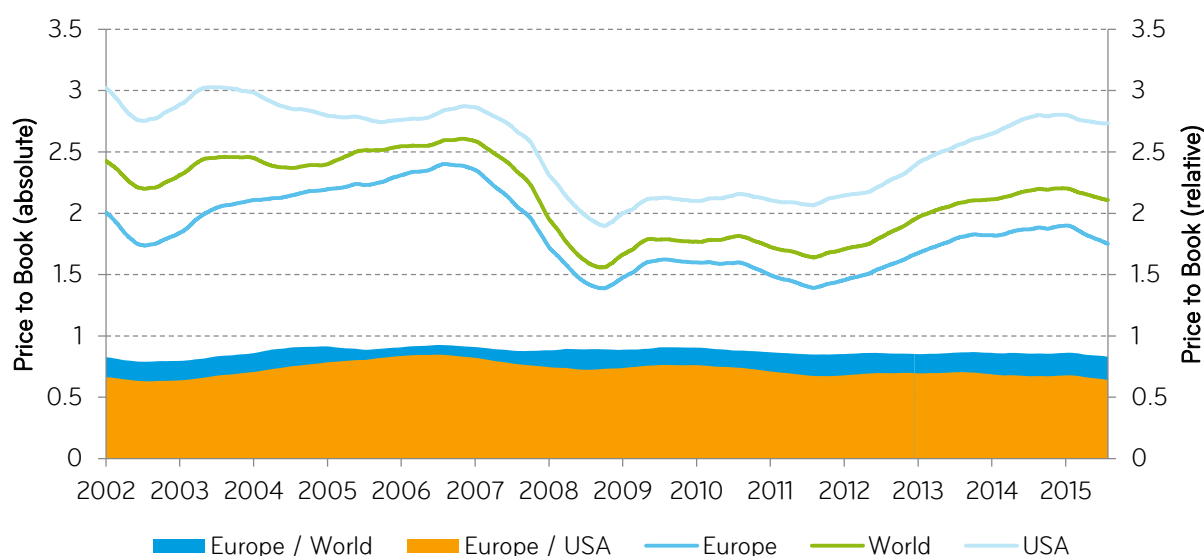
FIGURE 11: COUNTRY ALLOCATION OF STOXX EUROPE TMI

Source: STOXX data from Mar. 21, 2002 to Jun. 20, 2016

Market valuation

Compared to other major equity markets, Europe offers very attractive valuation characteristics. Scaling price by book value reveals that Europe, assessed via the STOXX Europe 600, is undervalued in relative terms. With a price to book (PB) ratio of just 1.77, it is 35% cheaper than the US equity market (PB ratio of 2.77) and still about 16% cheaper than the global equity market's weighted PB of 2.11 (see Figure 12)⁴. Compared to historical levels also, the European equity market is currently slightly cheaper than its long term average: with a PB ratio of 1.65 (Jun. 30, 2016), it is about 5% below its ten year average of 1.75.

FIGURE 12: ROLLING YEARLY AVERAGES OF PRICE-TO-BOOK RATIOS OF MAJOR EQUITY MARKETS

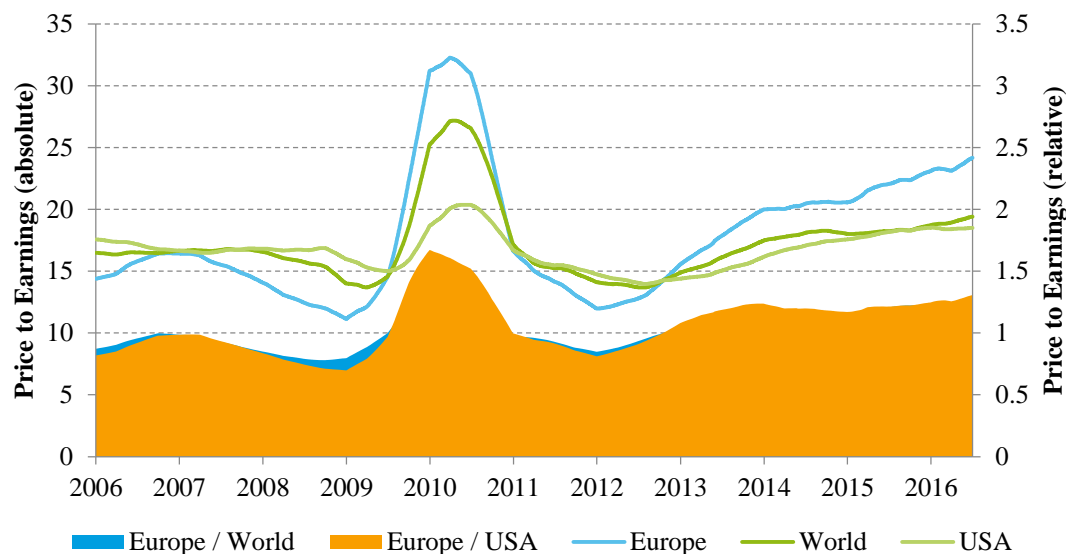


Source: STOXX and Bloomberg data from Dec. 2002 to Jun. 2016. Averages are based on broad country indices STOXX Europe 600, S&P 500 and MSCI World.

Similar observations in cross-sectional level deviations and developments over time can also be made for other valuation measures such as the price to forecasted earnings ratios. Please refer to Figure A1 of the Appendix for further information.

When looking at actual rather than expected earnings, however, the STOXX Europe 600 components were more expensive during the European debt crisis and in the recovery period since 2013 than those selected into the S&P 500 or the MSCI World (see Figure 13).

⁴ All figures based on yearly averages. Cut-off date: Jun. 30, 2016.

FIGURE 13: ROLLING YEARLY AVERAGES OF PRICE-TO-EARNINGS RATIOS OF MAJOR EQUITY MARKETS

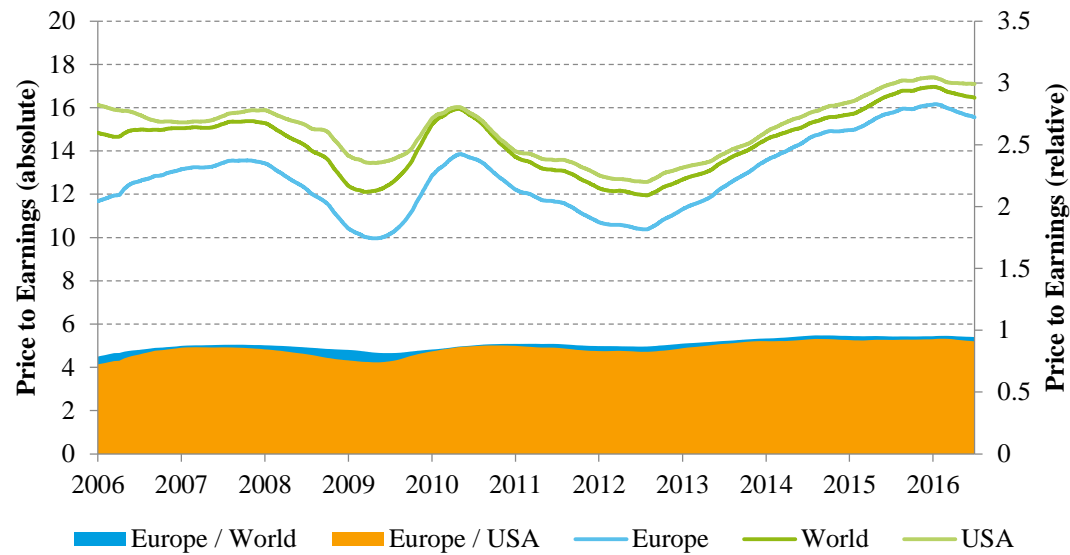
Source: STOXX and Bloomberg data from Dec. 2002 to Jun. 2016. Averages are based on broad country indices STOXX Europe 600, S&P 500 and MSCI World.

Conclusion

With a coverage of about 90% of the free-float market cap of the developed European equity market, the STOXX Europe 600 offers a broad, yet liquid and thus easily tradable access to Europe. This comprehensive market coverage provides investors with a country and industry allocation that is very representative of the underlying market. By extending the index's reach beyond mere large cap stocks, the STOXX Europe 600 additionally captures the relative outperformance of mid- and small-cap stocks as observed for most of the last decade.

Appendix

FIGURE A1: ROLLING YEARLY AVERAGES OF PRICE-TO-FORECASTED EARNINGS RATIOS OF MAJOR EQUITY MARKETS



Source: STOXX and Bloomberg data from Dec. 2002 to Jun. 2016. Averages are based on broad country indices STOXX Europe 600, S&P 500 and MSCI World.

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