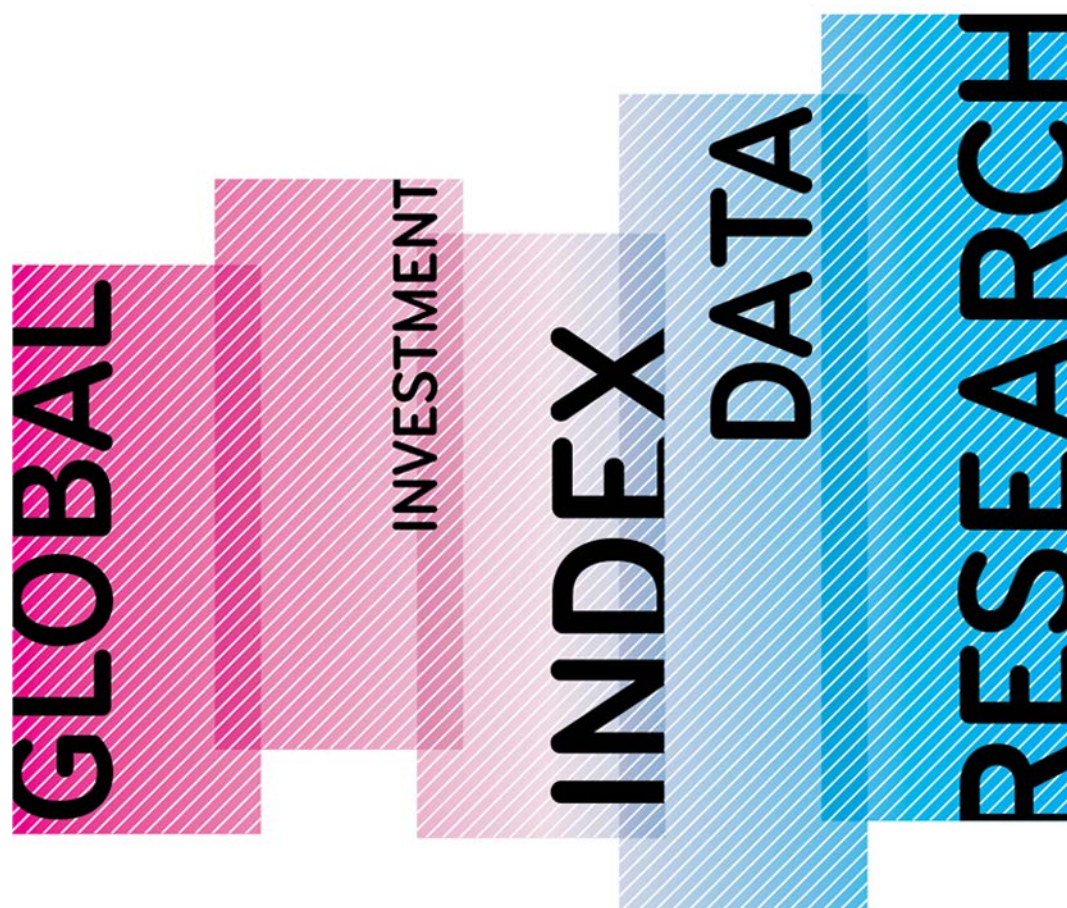


JUNE 2015

STOXX INTERNATIONAL EXPOSURE INDICES

GAINING INTERNATIONAL EXPOSURE VIA
LOCAL INVESTING

Dr. Jan-Carl Plagge, Director, STOXX Ltd.



STOXX

INNOVATIVE. GLOBAL. INDICES.

TABLE OF CONTENTS

Introduction	3
1 Determining regional revenue exposures	3
2 Market structure	5
3 Risk and return characteristics	13
4 The currency effect	16
5 Conclusion	19
Appendix	21

STOXX INTERNATIONAL EXPOSURE INDICES

Introduction

Investors typically assume that an investment in standard regional equity indices that select companies according to their country of domicile will provide them with adequate exposure to the targeted region. Far from it. Companies based in the Eurozone, for example, generate, on average, only about 56% of their revenue within the Eurozone. The rest is generated in other parts of the world. Japanese companies, on the other hand, do display a significantly higher "home bias" and generate, on average, about 74% of their revenue within Japan's borders. Consequently, Japanese companies depend on the characteristics and conditions of the local market, while Eurozone-based companies largely depend on conditions in foreign markets.

By identifying and explicitly measuring each company's regional source of revenue, STOXX International Exposure Indices enable investors to control for and make use of targeted exposures.

In this context, STOXX International Exposure Indices tilt the regional revenue exposure to achieve a more diversified, i.e. more international character. Both, the EURO STOXX International Exposure Index as well as the STOXX Japan International Exposure Index select only those companies that generate at least 50% of their revenue outside of the respective home region.

This approach is found to achieve two effects. First, the selected companies are less dependent on the respective local region. i.e., in times of local crises, companies with a high foreign revenue exposure are geographically more diversified and consequently less prone to local market conditions.

Second, and this partly follows from the first observation, both indices are found to provide an implicit hedge against a depreciation of the respective local currency. In other words, the outperformance of both STOXX International Exposure Indices relative to the respective standard equity benchmark is found to be negatively related to the value of the local currency. When the local currency depreciates, e.g. relative to the US dollar, STOXX International Exposure Indices tend to outperform their benchmarks and vice versa.

This paper puts the STOXX International Exposure Indices in a broader context by analyzing revenue exposure characteristics of two underlying equity markets: Eurozone and Japan. Implications of revenue tilts on performance as well as on risk characteristics are discussed. Lastly, the relation between foreign revenue tilts and the value of the respective local currency is investigated.

1 Determining regional revenue exposures

Determining companies' regional revenue exposure is a complex process. Typically, no reporting standard with regard to regional revenue breakdowns exists. It is up to each company to disclose its geographical revenue generation. In most cases, companies report revenue broken down to the country level merely for their home country. The remainder is typically reported on a more aggregated, e.g. regional level. Hereby, regions may be defined by political (European Union) or by regional boundaries (Asia).

To estimate the portion of revenue that is generated from each country, STOXX developed a proprietary revenue estimator which is based on macroeconomic country-dependent exports of goods and services.

Based on this information, revenue reported by companies on a regional level are broken down to the country level proportional to exported goods and services of the respective company's home country and all countries of the reported region. A significant advantage of this estimator compared to related estimators available is that it takes into account a country-dependent perspective. Revenue reported for a

STOXX INTERNATIONAL EXPOSURE INDICES

given region are broken down dependent on the reporting company's home country and its very unique export relations with the respective region.

If i denotes the company and H denotes this company's home country, then the revenue S_{i,c_R} generated by company i located in country H that are generated in country c_R of region R are calculated as follows:

$$S_{i,c_R} = \frac{EXP_{H,c_R}}{\sum_{c_R} EXP_{H,c_R}} S_{i,R}$$

where $S_{i,R}$ indicates the revenue of company i generated in region R . EXP_{H,c_R} indicates the exports from country H to country c_R of region R . $\sum_{c_R} EXP_{H,c_R}$ indicates the sum of exports from country H to all countries c in region R .

The German aviation company Lufthansa, for example, is selected in the EURO STOXX International Exposure Index due to its high share of non-Eurozone related revenue. It reports revenue on country level only for its home country and the United States (see Table 1). The remainder is provided on a regional level.

TABLE 1: REGIONAL REVENUE BREAKDOWN OF LUFTHANSA

Reported Region	Revenues (mn USD)	Revenue Share	Thereof Eurozone
Europe excl. Germany	14,326	34.64%	19.11%
Germany	11,007	26.62%	26.62%
USA	5,872	14.20%	--
APAC	5,544	13.41%	--
Central and South America	1,472	3.56%	--
Middle East	1,337	3.23%	--
North America excl. USA	927	2.24%	--
Africa	866	2.09%	--

Source: Capital IQ. Fiscal year: 2013

While it is obvious that the regions Asia/Pacific (APAC), Central and South America, Middle East, Africa as well as North America do not include any Eurozone-related revenue, the portion of Eurozone-related revenue of the region "Europe excl. Germany" needs to be determined.

The breakdown of revenue in proportion to goods and services exported from Germany to other European countries reveals that 19.11% out of 34.64% falls within Eurozone countries. Table 2 provides the top 10 European trading partners of Germany and their respective revenue percentage unscaled and scaled to yield the total share of 34.64% as reported by Lufthansa. While exports to Eurozone member states such as France and the Netherlands are fully taken into account to derive the Eurozone-related portion, exports to countries outside of the Eurozone such as Switzerland and the UK are set to zero.

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE 2: DISAGGREGATION OF REGIONAL REVENUES, FISCAL YEAR 2013

Region	Country	Region	Share of exports (absolute)	Share of exports (rescaled)	Revenue share (Eurozone)
Europe excl.Germany	France	Eurozone	13.49%	4.67%	4.67%
Europe excl.Germany	UK	Non-Eurozone	11.05%	3.83%	--
Europe excl.Germany	Netherlands	Eurozone	9.66%	3.35%	3.35%
Europe excl.Germany	Switzerland	Non-Eurozone	7.82%	2.71%	--
Europe excl.Germany	Austria	Eurozone	7.46%	2.58%	2.58%
Europe excl.Germany	Italy	Eurozone	7.15%	2.48%	2.48%
Europe excl.Germany	Belgium	Eurozone	5.68%	1.97%	1.97%
Europe excl.Germany	Poland	Non-Eurozone	5.56%	1.93%	--
Europe excl.Germany	Russia	Non-Eurozone	4.47%	1.55%	--
Europe excl.Germany	Spain	Eurozone	4.36%	1.51%	1.51%
...

Source: UN Comtrade and Service Trade database. Reported Period: 2013.

Having extracted the share of Eurozone-related revenue within the reported region "Europe excl. Germany", the portion of revenue that is generated outside of the Eurozone is then given as $100\% - 26.62\% - 19.11\% = 54.27\%$.

With a share of non-Eurozone revenue that exceeds the minimum threshold of 50%, Lufthansa is selected into the EURO STOXX International Exposure Index.

On the other hand, Deutsche Wohnen, a German real estate company, that generates 100% of its revenue in Germany, a Eurozone member, is excluded from the index.

2 Market Structure

The "home bias", or share of revenue that is generated within the boundaries of the local market can vary greatly between markets. The two markets covered by the Eurozone International Exposure Index as well as by the STOXX Japan International Exposure Index serve as a perfect example to shed light on these differences.

While Japan is a country with a very high home bias, i.e. about 74% of total corporate revenue are generated within Japan, the Eurozone is very export oriented, with the share of local revenue amounting to only 56%. In the process of constructing indices that select companies according to their regional source of revenue generation, these market-dependent peculiarities need to be carefully analyzed and well understood.

The following section focuses on the interaction of sales exposures with the dimensions size, industry as well as country allocation for the following two markets: Eurozone and Japan.

STOXX INTERNATIONAL EXPOSURE INDICES

Eurozone

Across most regions observed, revenue exposures to the local market are found to be negatively correlated with size, i.e. the smaller the company, the higher the share of total revenue generated locally. Consequently, a successive increase in revenue expected to be generated outside of a company's home country or region should lead to an increase in size. This observation also holds true in the Eurozone equity market.

It can be observed that the average market cap of companies selected into the respective portfolios successively increases up to a foreign minimum revenue exposure level of 70%. Increasing minimum exposure to levels beyond 70% leads to a reduction in size. However, the number of EURO STOXX companies with a foreign sales exposure of more than 70% is only 17 and may be considered non-representative.¹

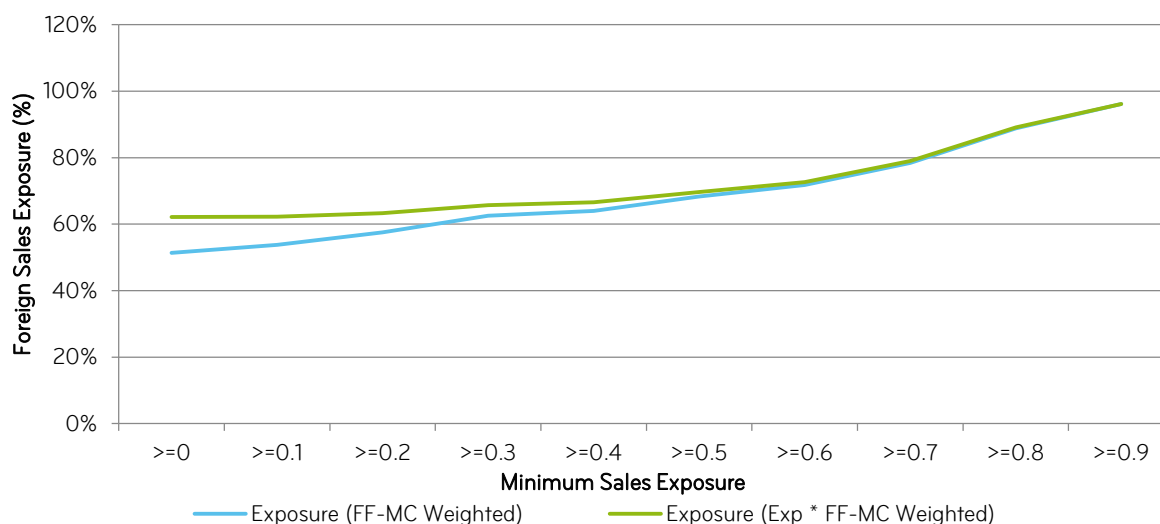
In this context, it is important to focus on the relation between the minimum required level and the effective level of foreign revenues. The effective share of foreign revenue always exceeds the minimum requirement. The EURO STOXX index, which can be interpreted as an index with a minimum foreign revenue requirement of 0%, displays a market-cap weighted share of foreign revenue of about 51%. However, as this is merely an average; companies in the EURO STOXX can have very different foreign exposure levels, such as the German company Deutsche Wohnen that generates no revenue abroad. An increase in the minimum required foreign revenue share for each constituent to 50%, as is implemented in the EURO STOXX Foreign Exposure Index, leads to a substantial increase in the effective non-Eurozone sales ratio of almost 20 percentage points to a level of 68%.

Figure 1 displays the influence of a successive increase in the minimum required foreign sales exposure on the effective foreign exposure.

¹ Please also refer to Table A.1 of the Appendix for a detailed overview of the figures underlying Figure 1.

STOXX INTERNATIONAL EXPOSURE INDICES

FIGURE 1: INFLUENCE OF A SUCCESSIVE INCREASE IN THE MINIMUM REQUIRED FOREIGN SALES EXPOSURE ON THE EFFECTIVE FOREIGN EXPOSURE



Source: STOXX Ltd., Capital IQ. Date: Mar. 22, 2015.

Figure 1: Average free-float market cap (right axis) and average foreign sales exposure weighted by free-float market cap as well as by the product of free-float market cap and foreign sales exposure (left axis) of EURO STOXX companies. Figures are calculated for portfolios based on minimum required foreign sales exposure ranging from 0% to 90%.

In order to consider foreign sales exposure not only in the context of stock selection but also in the weighting process, constituents of the STOXX International Exposure Indices are weighted by the product of free-float market cap and foreign revenue exposure. i.e., the weight of companies that generate a comparably smaller share of total revenue abroad is downscaled relative to that of companies that generate a high share of total revenue abroad. It can be observed in Figure 1 that this weighting methodology enables a further increase in effective exposures relative to a mere market-cap weighting, especially for portfolios with required foreign exposure levels up to 50%.

Next to the effect of the regional source of revenue generation on size and effective exposure, it is further important to understand that foreign sales exposures vary significantly among industries. Companies from the Utilities sector, for example, have a very strong home bias with an average market-cap weighted share of foreign revenues of only 32% while companies from the Technology sector, on the other hand, are very internationalized with an average market-cap weighted share of foreign revenue that amounts to as much as 69% (see Table 3).

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE 3: FOREIGN SALES EXPOSURES OF EURO STOXX COMPANIES PER ICB INDUSTRY

Industry	ICB Code	Foreign Sales Exposures (FF-MC weighted)	Foreign Sales Exposures (FF-MC * Exposure weighted)	Number of Companies
Oil & Gas	0001	44.74%	48.50%	10
Basic Materials	1000	58.03%	59.92%	21
Industrials	2000	56.79%	62.86%	56
Consumer Goods	3000	69.78%	71.64%	38
Health Care	4000	71.76%	73.19%	13
Consumer Services	5000	42.29%	52.97%	34
Telecommunications	6000	38.10%	52.97%	11
Utilities	7000	31.77%	38.71%	18
Financials	8000	33.38%	49.83%	62
Technology	9000	68.83%	76.25%	16

Source: STOXX, Capital IQ, ICB. Date : Mar. 22, 2015.

In this context, it is interesting to compare average exposure levels per sector weighted according to market cap with those weighted according to the product of market cap and exposure, as it is applied in the calculation of the STOXX International Exposure Indices.

It can be observed that by also taking into account the foreign exposure factor when weighting stocks, effective exposures can be increased substantially. The achieved increase is, in turn, a function of the distribution of exposures over all constituents. The more similar the exposures, the smaller the effect of weighting stocks also by exposure. i.e. in the extreme, where all exposure factors were identical, both weighting mechanisms would derive the same weighted effective exposure.

For the case of the EURO STOXX, we observe the biggest absolute increase among companies from the Financials Sector (+16.44%) while the increase among companies from the Health Care sector is the smallest with an absolute increase of 1.42%.

It is quite intuitive that these sector dependencies of the regional source of revenue generation are found to effect the sector allocation of indices when successively increasing the required share of foreign sales.

So does a successive increase in the level of required foreign revenue lead, ceteris paribus, to an increase in the weights of those sectors that have a high exposure to foreign markets, such as Technology and to a decrease in the weights of sectors that are strongly exposed to the local market, such as Utilities. Table 4 provides the sector allocations of the EURO STOXX and respective subsets composed according to different minimum foreign sales exposures ranging from 0% to 50%. It can be observed that, when increasing minimum foreign revenue exposure from 0% to 50%, the weights of sectors with a high home bias, such as Utilities, is slightly reduced from 3.6% to 1.3%. On the other hand, the weights of sectors with a low home bias, such as Technology or Health Care, increase by about 2 percentage points.

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE 4: INDUSTRY ALLOCATION OF EURO STOXX AND EURO STOXX SUBSETS AS A FUNCTION OF A SUCCESSIVE INCREASE OF THE MINIMUM LEVEL OF FOREIGN SALES EXPOSURE

Industry	ICB Code	Number of Companies	Minimum Exposure Level					
			0.00%	10.00%	20.00%	30.00%	40.00%	50.00%
Oil & Gas	0001	10	4.48%	4.49%	4.56%	4.85%	4.69%	2.20%
Basic Materials	1000	21	11.38%	11.40%	11.66%	12.40%	12.75%	11.13%
Industrials	2000	56	16.39%	16.41%	16.60%	16.99%	16.79%	18.08%
Consumer Goods	3000	38	24.37%	24.42%	24.96%	26.55%	27.15%	29.87%
Health Care	4000	13	8.01%	8.02%	8.20%	8.72%	8.97%	10.07%
Consumer Services	5000	34	5.54%	5.50%	5.56%	5.39%	4.45%	3.93%
Telecommunications	6000	11	3.43%	3.40%	3.15%	3.32%	3.41%	2.40%
Utilities	7000	18	3.55%	3.55%	3.43%	2.34%	1.84%	1.29%
Financials	8000	62	15.42%	15.37%	14.31%	11.40%	11.69%	11.57%
Technology	9000	16	7.44%	7.44%	7.56%	8.04%	8.27%	9.45%

Source: STOXX, ICB. Period: Date: Mar. 22, 2015.

The observed sector dependency of regional sales allocations can also be transferred to the country level. Companies incorporated in Belgium, for example, generate, on a market-cap weighted basis, 70% of their revenue outside the Eurozone, while companies from Portugal generate only about 25% of their revenue abroad (see Table 5). These regional peculiarities, again, slightly influence the effect of an increase in exposure levels on country allocations. However, deviations are found to be of minor impact (see Table 6).

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE 5: FOREIGN SALES EXPOSURES OF EURO STOXX PER COUNTRY

Country	Foreign Sales Exposures (FF-MC weighted)	Foreign Sales Exposures (FF-MC * Exposure weighted)	Number of Companies
Austria	43.26%	53.25%	7
Belgium	70.36%	80.10%	12
Finland	59.08%	65.05%	16
France	49.35%	59.18%	83
Germany	53.60%	59.81%	58
Greece	26.93%	55.98%	4
Ireland	61.63%	66.33%	9
Italy	31.72%	55.10%	30
Luxembourg	56.85%	61.74%	3
Netherlands	57.09%	70.86%	25
Portugal	25.36%	41.85%	4
Spain	52.10%	62.50%	28

Source: STOXX, Capital IQ, Date: Mar. 22, 2015.

TABLE 6: COUNTRY ALLOCATION OF EURO STOXX AND EURO STOXX SUBSETS AS A FUNCTION OF A SUCCESSIVE INCREASE OF THE MINIMUM LEVEL OF FOREIGN SALES EXPOSURE

Country	Number of Companies	Minimum Exposure Level					
		0.00%	10.00%	20.00%	30.00%	40.00%	50.00%
Austria	7	0.53%	0.53%	0.49%	0.52%	0.50%	0.37%
Belgium	12	5.43%	5.44%	5.52%	5.56%	5.72%	6.42%
Finland	16	3.72%	3.71%	3.78%	3.88%	3.99%	4.26%
France	83	31.09%	31.12%	31.21%	30.13%	29.45%	28.21%
Germany	58	30.28%	30.27%	30.82%	31.27%	31.95%	31.09%
Greece	4	0.10%	0.10%	0.10%	0.07%	0.08%	0.09%
Ireland	9	2.22%	2.22%	2.27%	2.42%	2.16%	2.22%
Italy	30	5.00%	5.00%	4.40%	3.74%	3.85%	4.39%
Luxembourg	3	0.68%	0.68%	0.67%	0.71%	0.73%	0.83%
Netherlands	25	9.42%	9.40%	9.15%	9.60%	9.72%	10.05%
Portugal	4	0.26%	0.26%	0.13%	0.14%	0.14%	0.16%
Spain	28	11.29%	11.27%	11.48%	11.96%	11.72%	11.92%

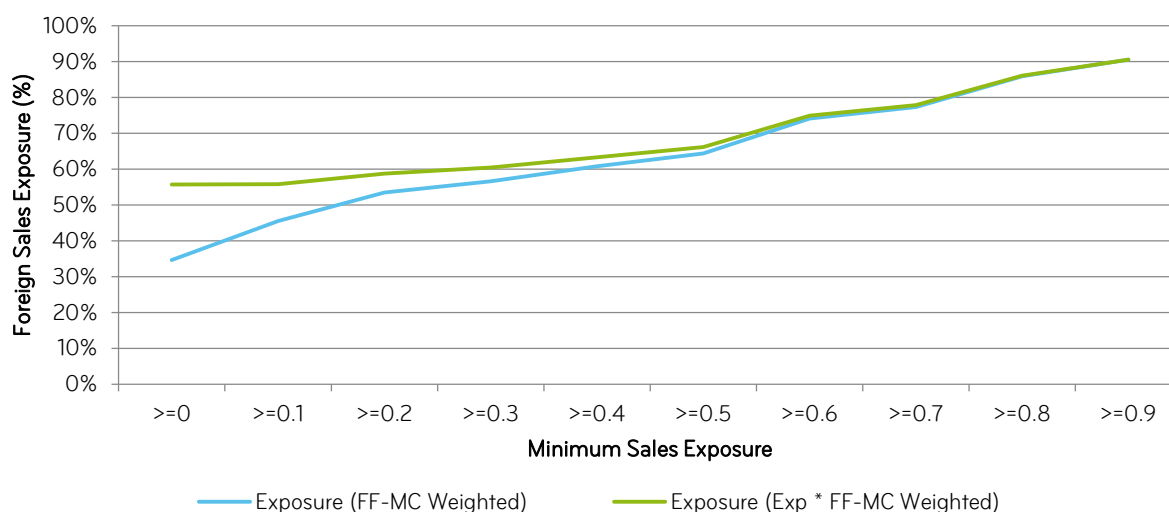
Source: STOXX. Date: Mar. 22, 2015. Allocation based on free-float market cap times exposure weighted constituents.

STOXX INTERNATIONAL EXPOSURE INDICES

Japan

The observations made in the context of the Eurozone equity market can also be applied to the Japanese market. The relationship between foreign sales exposures and size is also found to be positive for Japanese companies (see Figure 2). However, this positive relation holds true only up to a required foreign sales level of 50%. Thereafter, average market cap slightly declines before increasing again when raising the level to values beyond 80%.²

FIGURE 2: INFLUENCE OF A SUCCESSIVE INCREASE IN THE MINIMUM REQUIRED FOREIGN SALES EXPOSURE ON THE EFFECTIVE FOREIGN EXPOSURE



Source: STOXX Ltd., Capital IQ. Date: Mar. 22, 2015.

Figure 2: Average free-float market cap (right axis) and average foreign sales exposure weighted by free-float market cap as well as by the product of free-float market cap and foreign sales exposure (left axis) of STOXX Japan 600 companies. Figures are calculated for portfolios based on minimum required foreign sales exposure ranging from 0% to 90%.

As mentioned, Japanese companies generate, on average, a significantly higher share of total revenue locally than is the case for Eurozone companies. The market-cap weighted effective share of foreign sales of the STOXX Japan 600 constituents is only 34%. Consequently, an increase in the required minimum revenue threshold to a level of 50%, as it is applied for the STOXX Japan International Exposure Index, has an even more significant effect on the effective share of foreign sales as is the case for the EURO STOXX Foreign Exposure Index. The cap-weighted foreign sales ratio of the STOXX Japan International Exposure Index could almost be doubled to about 64%.

The previously observed sector dependence² of foreign sales ratios can also be found among Japanese companies. Compared to the EURO STOXX, sector deviations are even more distinct. Companies from

² Please also refer to Table A.2 of the Appendix for a detailed overview of the figures underlying Figure 2.

STOXX INTERNATIONAL EXPOSURE INDICES

the Utilities sector generate only 0.2% of their revenue abroad. Companies from the Consumer Goods Sector, on the other hand, generate 53% of their revenue in foreign markets (see Table 7).

TABLE 7: FOREIGN SALES EXPOSURES OF STOXX JAPAN 600 COMPANIES

Industry	ICB Code	Foreign Sales Exposures (FF-MC weighted)	Foreign Sales Exposures (FF-MC * Exposure weighted)	Number of Companies
Oil & Gas	0001	29.17%	38.79%	7
Basic Materials	1000	44.05%	50.10%	54
Industrials	2000	46.02%	61.75%	139
Consumer Goods	3000	52.56%	60.91%	106
Health Care	4000	40.84%	54.10%	38
Consumer Services	5000	8.56%	27.81%	86
Telecommunications	6000	17.50%	37.63%	5
Utilities	7000	0.20%	9.48%	14
Financials	8000	12.88%	25.10%	92
Technology	9000	45.42%	59.92%	35

Source: STOXX, Capital IQ. Date: Mar. 22, 2015.

As observed in the context of the European equity market, a successive increase in the required foreign revenue threshold leads to a reallocation away from sectors with a high home bias, e.g. the Utilities or Consumer Services sector, to sectors with a low home bias such as Consumer Goods or Industrials (see Table 8).

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE 8: INDUSTRY ALLOCATION OF STOXX JAPAN 600 AND DERIVED SUBSETS AS A FUNCTION OF A SUCCESSIVE INCREASE OF THE MINIMUM LEVEL OF FOREIGN SALES EXPOSURE.

STOXX Japan 600	ICB Code	Number of companies	Minimum Foreign Exposure Level					
			0.00%	10.00%	20.00%	30.00%	40.00%	50.00%
Oil & Gas	0001	7	0.70%	0.70%	0.57%	0.56%	0.58%	0.00%
Basic Materials	1000	54	8.39%	8.42%	8.84%	9.18%	6.67%	5.09%
Industrials	2000	139	28.33%	28.32%	28.46%	29.53%	31.25%	31.73%
Consumer Goods	3000	106	36.77%	36.78%	38.76%	40.61%	43.29%	46.09%
Health Care	4000	38	8.01%	8.01%	8.25%	8.54%	9.05%	9.29%
Consumer Services	5000	86	2.87%	2.81%	2.42%	1.45%	0.00%	0.00%
Telecommunications	6000	5	2.25%	2.25%	2.04%	2.15%	2.39%	0.00%
Utilities	7000	14	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Financials	8000	92	6.52%	6.53%	4.37%	1.50%	0.10%	0.07%
Technology	9000	35	6.16%	6.17%	6.30%	6.49%	6.67%	7.74%

Source: STOXX, ICB. Date: Mar. 22, 2015. Allocation based on free-float market cap times exposure weighted constituents.

Hereby, sector deviations relative to the benchmark, measured in absolute terms are found to be slightly higher compared to those found for the Eurozone market. So does the weight of the Consumer Goods sector in the Japanese market increase by about 10 percentage points when raising the level of required foreign exposure to 50%, while it only increases by 5 percentage points for the case of the Eurozone (in both markets, the increase in the weight of the Consumer Goods sector is the highest in absolute terms).

The reason for this observation is quite intuitive. Since the average share of revenue generated locally is substantially higher in the Japanese market compared to the Eurozone, deviations arising when successively increasing required foreign revenue levels lead to higher deviations relative to the broad market.

3 Risk and Return Characteristics

The performed tilt in the regional source of sales generation is, of course, not an end in itself. It is done in order to achieve two very important effects.

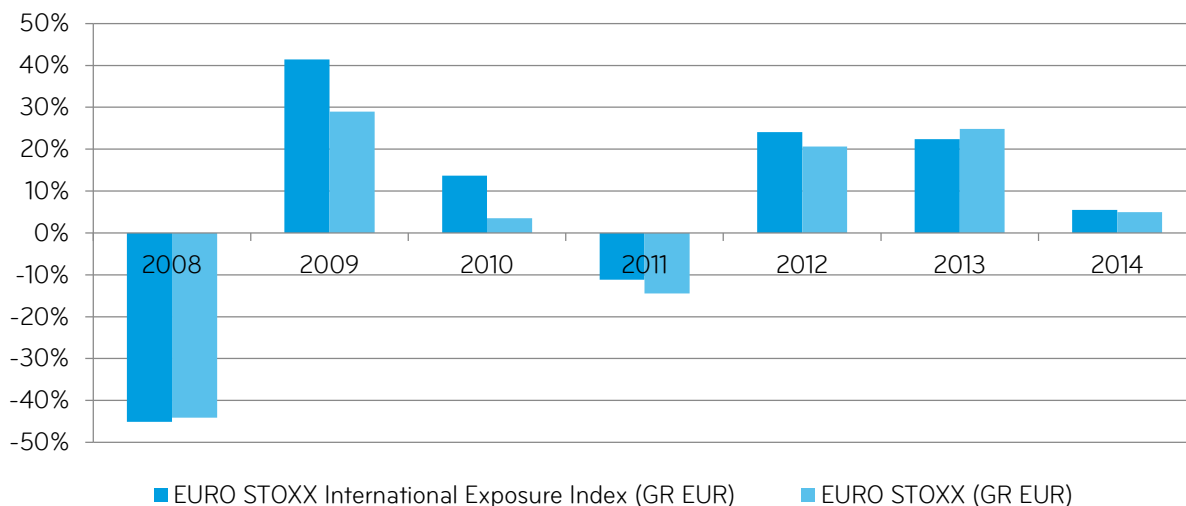
Eurozone

The first effect is rather straightforward. Companies that generate a substantial portion of their revenue outside their home country or region should be less exposed to local market conditions. Consequently, they should be less affected by local crises given their regionally more diversified source of revenue.

This effect can be demonstrated by comparing the performance of the STOXX International Exposure Index with that of the EURO STOXX Index over the last seven years (see Figure 3).

STOXX INTERNATIONAL EXPOSURE INDICES

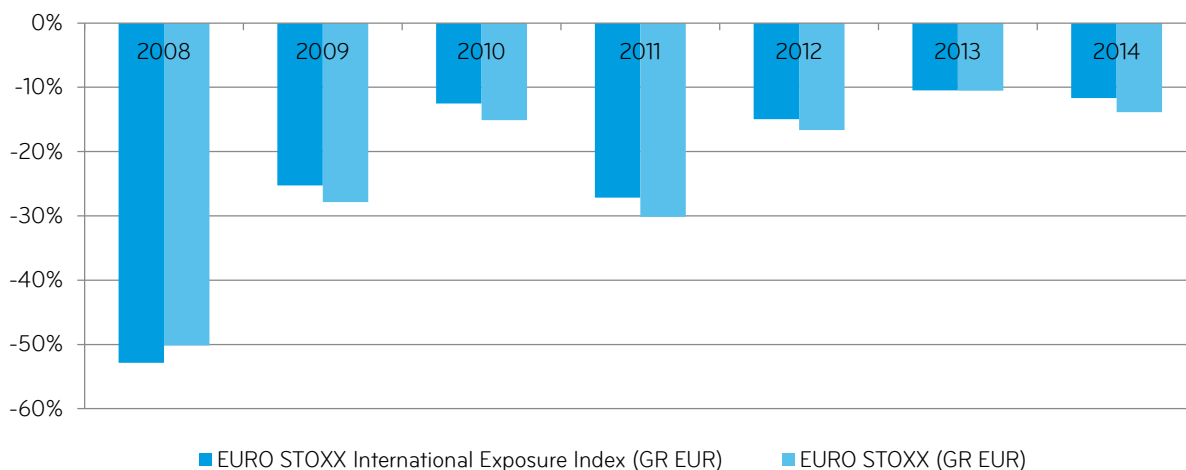
FIGURE 3: ANNUAL PERFORMANCE OF EURO STOXX AND EURO STOXX INTERNATIONAL EXPOSURE INDEX



Source: STOXX. Returns: EUR Gross.

During the years 2009, 2010 and 2011, which were substantially influenced by the European crisis, the EURO STOXX International Exposure Index displays significantly higher returns than the EURO STOXX. This observation is further supported by maximum drawdowns that were, with the exception of the year 2008, persistently below those of the EURO STOXX (see Figure 4).

FIGURE 4: ANNUAL MAXIMUM DRAWDOWNS OF EURO STOXX AND EURO STOXX INTERNATIONAL EXPOSURE INDEX



Source: STOXX. Returns: EUR Gross.

STOXX INTERNATIONAL EXPOSURE INDICES

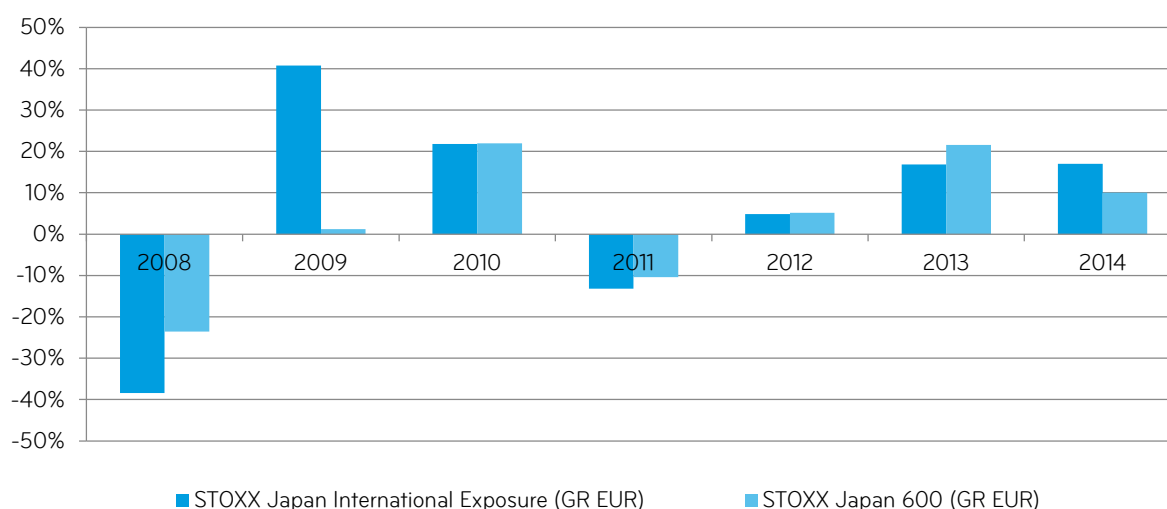
Looking at volatility figures further supports this “immunization” argument. Being less affected by local events, the EURO STOXX International Exposure Index persistently displays lower levels of risk than the benchmark EURO STOXX since 2010 (see Table A3 of the Appendix).

Japan

Compared to its benchmark, the STOXX Japan International Exposure Index displays quite different performance characteristics in certain years. In 2008, for example, it underperformed the broader STOXX Japan 600. However, this underperformance has been more than compensated in the following year. In 2014, it again significantly outperformed its benchmark (see Table A4 of the Appendix). The reason for these performance differences can, to a certain extent, be traced back to a second very important characteristic of the STOXX International Exposure Indices: the reaction to the value of the respective market’s local currency. This effect will be further analyzed in the following chapter.

Annualized drawdowns as well as volatility figures of the STOXX Japan International Exposure Index are found to be slightly higher than those of its benchmark (see Figure 6 as well as Table A.4 of the Appendix). Thus, Japanese companies that generate a substantial portion of their revenue outside of Japan are found to be slightly more risky investments than companies that are predominantly exposed to the local Japanese market. In addition, the benchmark index STOXX Japan 600 profits from a significant diversification effect stemming from its 600 constituents. The STOXX Japan international Exposure Index, on the other hand, currently includes only 142 companies (date: May 26, 2015). This lower number of constituents should account for some of the observed increase in volatility.

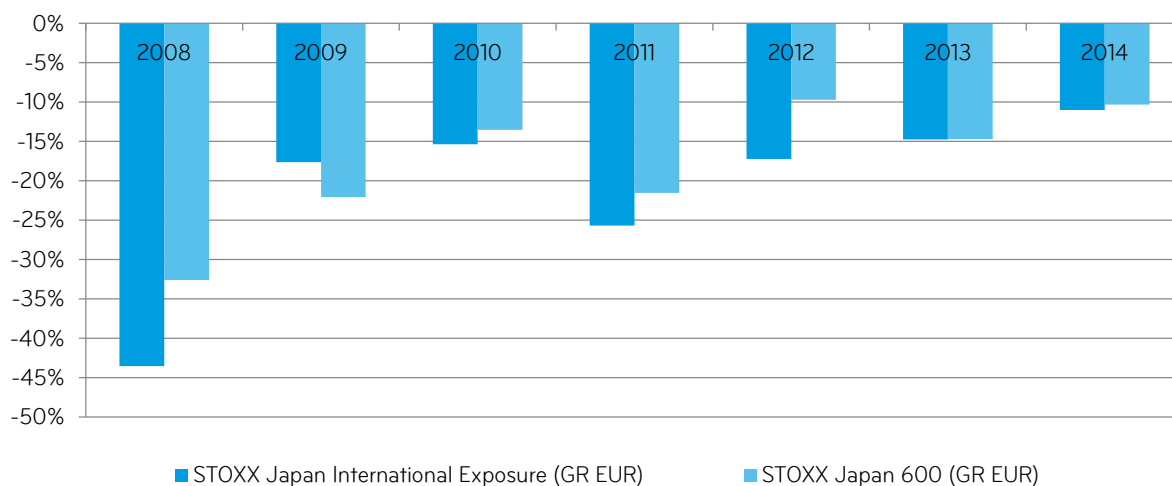
FIGURE 5: ANNUAL PERFORMANCE OF STOXX JAPAN 600 AND STOXX JAPAN INTERNATIONAL EXPOSURE INDEX



Source: STOXX. Returns: EUR Gross.

STOXX INTERNATIONAL EXPOSURE INDICES

FIGURE 6: ANNUAL MAXIMUM DRAWDOWNS OF STOXX JAPAN 600 AND STOXX JAPAN INTERNATIONAL EXPOSURE INDEX



Source: STOXX. Returns: EUR Gross.

4 The currency effect

The second important characteristic captured by STOXX International Exposure Indices relates to their reaction to changes in the value of local currencies. This reaction is characterized by a negative relation of the indices' outperformance relative to their benchmarks and the value of the respective local currency.

Or, to put it differently, STOXX International Exposure Indices tend to outperform their benchmarks when the local currency depreciates. This behavior can also be interpreted as an implicit currency hedge. The functionality is quite intuitive. A Eurozone company, for example, that generates a substantial portion of its revenue outside of the Eurozone, e.g. in the United States, observes an increase in its euro-denominated revenue when the US dollar appreciates relative to the euro.

Figure 7 and 8 display this relationship for the case of the EURO STOXX International Exposure Index. Figure 7 identifies different periods of increases and decreases of the euro relative to the US dollar, while Figure 8 compares the outperformance of the EURO STOXX International Exposure Index relative to the EURO STOXX Index with the percentage change in the currency value for each period identified. It can be observed that the anticipated opposite movement of the two variables, the index's relative outperformance and the value of the euro holds true in most periods identified.

However, when looking at the period from Feb. 18, 2009 to Dec. 1, 2009 (period 5 in Figure 8), we find that the opposing direction cannot be observed: an appreciation of the euro was accompanied by a simultaneous outperformance of the EURO STOXX International Exposure Index compared to the EURO STOXX. This observation is important as it shows that the relative performance differential between both indices is not only driven by currency effects. With effectively about 70% of revenue generated outside of the Eurozone, companies selected into the EURO STOXX International Index also depend on general

STOXX INTERNATIONAL EXPOSURE INDICES

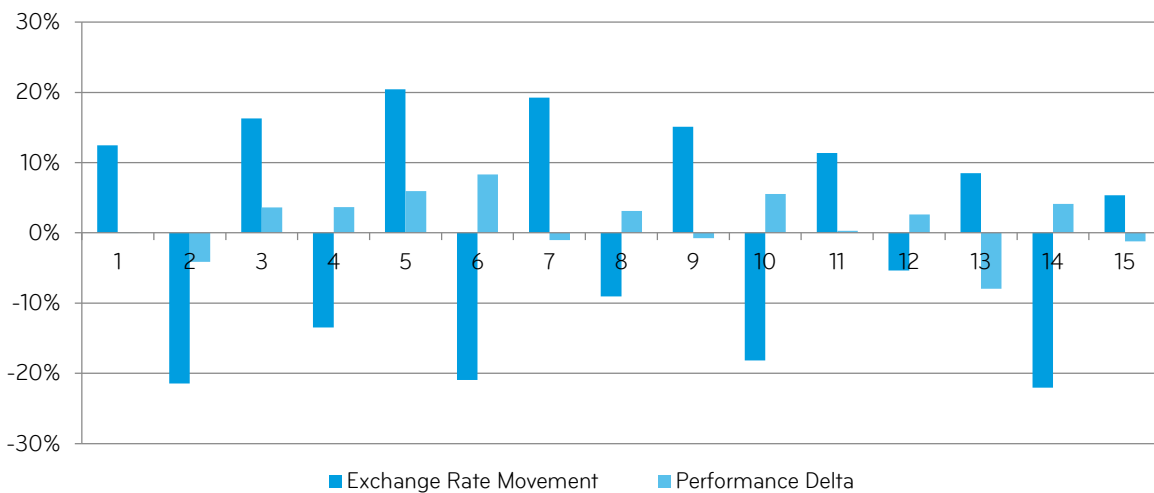
economic conditions of these foreign markets. If sufficiently pronounced, these characteristics can overcompensate the currency effect.

FIGURE 7: DEVELOPMENT OF USD/EUR EXCHANGE RATE



Source: Factset. Time period: Sep. 21, 2007 to May 15, 2015.

FIGURE 8: INTERACTION OF EXCHANGE RATE MOVEMENT AND OUTPERFORMANCE OF EURO STOXX INTERNATIONAL EXPOSURE INDEX RELATIVE TO BENCHMARK



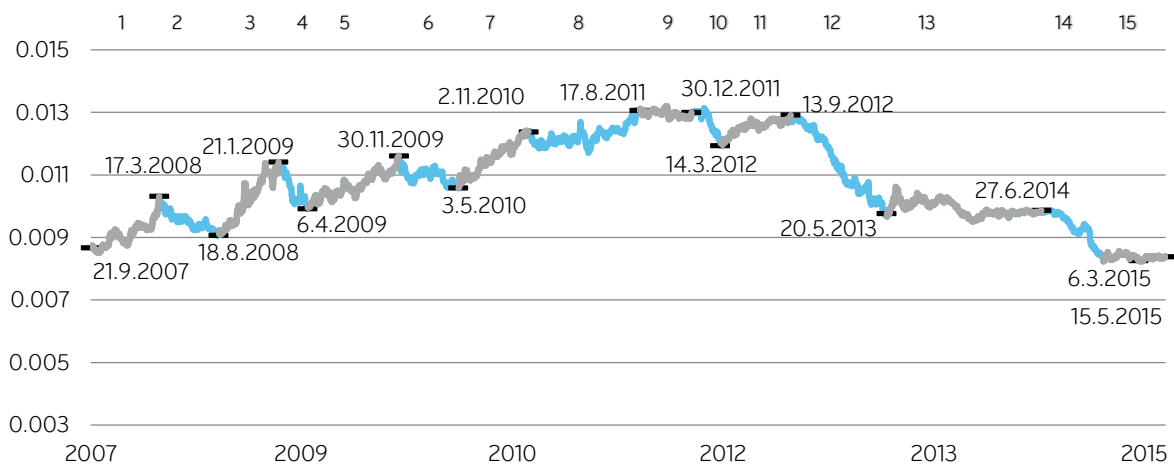
Source: STOXX, Factset. Time period: Sep. 21, 2007 to May 15, 2015.

STOXX INTERNATIONAL EXPOSURE INDICES

Figure 8: Development of USD/EUR exchange rate and outperformance of EURO STOXX International Exposure Index over Euro STOXX (EUR GR). Time period: Sep. 21, 2007 to May 15, 2015. The numbers below the plotted bars indicate the reference period displayed above Figure 7. Source: STOXX, Factset.

The relation between index (out)performance and the currency value can also be made for the STOXX Japan International Exposure Index (see Figures 9 and 10). In most periods identified, the STOXX Japan International Exposure Index outperformed its benchmark, the STOXX Japan 600 index, when the JPY depreciated relative to the US Dollar.

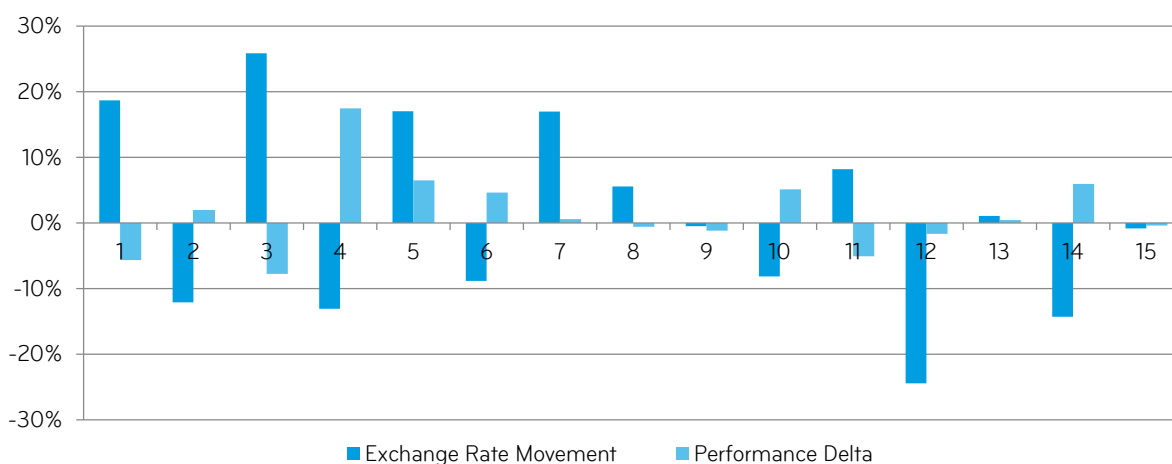
FIGURE 9: DEVELOPMENT OF USD/JPY EXCHANGE RATE



Source: Factset. Time period: Sep. 21, 2007 to May 15, 2015.

STOXX INTERNATIONAL EXPOSURE INDICES

FIGURE 10: INTERACTION OF EXCHANGE RATE MOVEMENT AND OUTPERFORMANCE OF STOXX JAPAN INTERNATIONAL EXPOSURE INDEX RELATIVE TO BENCHMARK



Source: Factset. Time period: Sept. 21, 2007 to May 15, 2015.

Figure 10: Development of USD/JPY exchange rate and outperformance of STOXX Japan International Exposure Index over STOXX Japan 600 (JPY GR). Time period: Sep. 21, 2007 to May 15, 2015. The numbers below the plotted bars indicate the reference period displayed above Figure 9. Source: STOXX, Factset.

In light of these findings, STOXX International Exposure Indices offer an investment vehicle for investors that expect a devaluation of the euro and/or the yen. This characteristic is of topical importance in light of the application of monetary instruments such as quantitative easing that have led to a substantial devaluation of the euro and the yen in recent periods.

5 Conclusion

The EURO STOXX International Exposure Index as well as the STOXX Japan International Exposure Index select Eurozone and Japanese companies respectively that generate at least 50% of their revenue outside the respective local market.

A proprietary revenue estimator, which takes into account intra-country export relations, developed by STOXX, allows for a high quality estimation of the regional source of revenue even if companies do not provide full disclosure of their revenue breakdown.

By making the regional source of revenue explicit, STOXX International Exposure Indices enable investors to effectively control regional revenue exposure and make use of certain market characteristics.

In this context, the EURO STOXX International Exposure Index is found to have been significantly less affected by the recent European crisis. An observation that is, among other factors, driven by the high level of regional revenue diversification achieved by the definition of the minimum foreign revenue level of 50% required for each constituent to enter the index.

STOXX INTERNATIONAL EXPOSURE INDICES

Further, both indices, the EURO STOXX International Exposure Index as well as the STOXX Japan International Exposure Index, are found to provide characteristics of an implied currency hedged, i.e. the indices tend to outperform their benchmarks when the respective local currency depreciates.

To further intensify the observed implicit hedge against a depreciation of the respective local currency, STOXX offers both STOXX International Exposure indices also in combination with an explicit hedge using forward currency contracts sold on a monthly basis. The EURO STOXX International Exposure index is hedged from a USD as well as from a GBP perspective, while the STOXX Japan International Exposure Index is hedged from a EUR and a USD perspective.

Applying an explicit hedge against the euro or the JPY, for example from a USD perspective, substantially mitigates a US dollar denominated investor's losses that may occur from a euro or a JPY that depreciates during the time of the investment. In addition, the investor would profit from the implicit hedge as it derives from selecting Eurozone- or Japan-based companies that generate a substantial portion of their revenue outside of the respective local currency.

STOXX INTERNATIONAL EXPOSURE INDICES

Appendix

TABLE A1: SIZE, EFFECTIVE EXPOSURE AND MARKET COVERAGE AS FUNCTION OF REQUIRED MINIMUM FOREIGN SALES EXPOSURES

Minimum foreign sales exposure	Average MC - EUR	Average exposure	FF-MC-weighted average MC	FF-MC * exposure weighted Average MC	Number of companies
>=0	13,751,735,182	44.08%	51.33%	62.09%	279
>=0.1	15,290,607,213	51.16%	53.77%	62.21%	239
>=0.2	16,233,108,401	57.15%	57.49%	63.28%	206
>=0.3	15,882,742,281	61.27%	62.53%	65.67%	182
>=0.4	16,567,613,137	63.71%	63.92%	66.52%	166
>=0.5	16,458,378,425	67.69%	68.27%	69.68%	137
>=0.6	17,194,877,235	71.80%	71.77%	72.65%	103
>=0.7	17,340,726,359	78.98%	78.39%	79.00%	47
>=0.8	12,457,387,159	86.97%	88.84%	89.08%	17
>=0.9	12,338,459,071	93.91%	96.12%	96.16%	4

Table A1: This Table provides average, free-float market cap weighted as well as free-float market weighted times exposure weighted average market cap and effective exposure figures for EURO STOXX constituents each dependent on minimum foreign revenue exposure figures varying from 0 to 90%. Date: Mar. 22, 2015. Source: STOXX, Capital IQ.

TABLE A2: SIZE, EFFECTIVE EXPOSURE AND MARKET COVERAGE AS FUNCTION OF REQUIRED MINIMUM FOREIGN SALES EXPOSURES

Minimum foreign sales exposure	Average MC - EUR	Average Exposure	FF-MC-Weighted Average MC -	FF-MC * Exposure Weighted Average MC	Number of Companies
>=0	5,894,589,536	26.03%	34.60%	55.67%	576
>=0.1	7,171,352,685	41.61%	45.52%	55.79%	359
>=0.2	7,903,222,485	51.90%	53.45%	58.68%	259
>=0.3	8,091,348,345	55.92%	56.61%	60.46%	226
>=0.4	8,241,972,903	60.46%	60.81%	63.27%	186
>=0.5	8,980,002,444	65.58%	64.31%	66.11%	139
>=0.6	7,113,488,372	72.73%	74.12%	74.88%	83
>=0.7	8,578,253,851	78.41%	77.27%	77.81%	49
>=0.8	6,874,655,203	85.10%	85.83%	86.02%	19
>=0.9	13,550,431,257	90.54%	90.50%	90.50%	3

Table A2: This Table provides average, free-float market cap weighted as well as free-float market weighted times exposure weighted average market cap and effective exposure figures for STOXX Japan 600 constituents each dependent on minimum foreign revenue exposure figures varying from 0 to 90%. Date: Mar. 22, 2015. Source: STOXX, Capital IQ.

STOXX INTERNATIONAL EXPOSURE INDICES

TABLE A3: RISK AND RETURN CHARACTERISTICS OF EURO STOXX INTERNATIONAL EXPOSURE INDEX AND EURO STOXX INDEX

Year	Performance		Volatility		Drawdown	
	EURO STOXX International Exposure Index	EURO STOXX	EURO STOXX International Exposure Index	EURO STOXX	EURO STOXX International Exposure Index	EURO STOXX
2008	-45.13%	-44.11%	39.98%	37.03%	-52.87%	-50.18%
2009	41.42%	28.94%	27.46%	25.82%	-25.26%	-27.87%
2010	13.67%	3.52%	21.01%	21.50%	-12.50%	-15.11%
2011	-11.18%	-14.43%	25.87%	26.78%	-27.16%	-30.13%
2012	24.06%	20.63%	18.35%	19.08%	-14.96%	-16.64%
2013	22.41%	24.84%	13.94%	14.39%	-10.45%	-10.53%
2014	5.50%	4.97%	14.67%	15.55%	-11.67%	-13.87%

Table A3: This Table provides annual performance, volatility as well as drawdown figures for the years 2008 to 2014. Volatility figures are annualized and calculated based on daily logarithmic returns. All data is based on EUR Gross Return Indices.

TABLE A4: RISK AND RETURN CHARACTERISTICS OF STOXX JAPAN INTERNATIONAL EXPOSURE INDEX AND STOXX JAPAN 600 INDEX

Year	Performance		Volatility		Drawdown	
	STOXX Japan International Exposure	STOXX Japan 600	STOXX Japan International Exposure	STOXX Japan 600	STOXX Japan International Exposure	STOXX Japan 600
2008	-38.40%	-23.53%	43.11%	34.94%	-43.54%	-32.61%
2009	40.75%	1.22%	32.08%	24.32%	-17.63%	-22.06%
2010	21.82%	21.98%	21.86%	17.82%	-15.34%	-13.54%
2011	-13.19%	-10.36%	25.26%	23.92%	-25.69%	-21.54%
2012	4.85%	5.15%	19.31%	15.49%	-17.25%	-9.72%
2013	16.83%	21.54%	22.15%	20.97%	-14.77%	-14.71%
2014	16.97%	10.01%	18.06%	17.33%	-11.01%	-10.33%

Table A4: This Table provides annual performance, volatility as well as drawdown figures for the years 2008 to 2014. Volatility figures are annualized and calculated based on daily logarithmic returns. All data is based on EUR Gross Return Indices.

STOXX INTERNATIONAL EXPOSURE INDICES

About STOXX

STOXX Ltd. is a global index provider, currently calculating a global, comprehensive index family of over 6,000 strictly rules based and transparent indices. Best known for the leading European equity indices EURO STOXX 50, STOXX Europe 50 and STOXX Europe 600, STOXX Ltd. maintains and calculates the STOXX Global Index family which consists of total market, broad and blue-chip indices for the regions Americas, Europe, Asia, and Pacific, the sub-regions Latin America and BRIC (Brazil, Russia, India and China), as well as global markets.

To provide market participants with optimal transparency, STOXX indices are classified in three different categories. The regular "STOXX" indices include all standard, theme and strategy indices that are part of STOXX's integrated index family and follow a strict rules-based methodology. The "iSTOXX" brand typically comprises less standardized index concepts that are not integrated in the STOXX Global Index Family, but are nevertheless strictly rules-based. While indices that are branded "STOXX" and "iSTOXX" are developed by STOXX for a broad range of market participants, the "STOXX Customized" brand covers indices that are specifically developed for clients and do not carry the STOXX brand in the index name."

The STOXX indices are licensed to over 400 companies around the world as underlyings for Exchange Traded Funds (ETFs), Futures & Options, Structured Products and passively-managed investment funds. Three of the top Exchange Traded Funds (ETFs) in Europe and 30 percent of all assets under management are based on STOXX indices. STOXX Ltd. holds Europe's number one and the world's number three position in the derivatives segment.

In addition, STOXX Ltd. is the marketing agent for the indices of Deutsche Boerse AG and SIX, amongst them the DAX and the SMI indices.

STOXX Ltd. is part of Deutsche Boerse AG and SIX.

www.stoxx.com

CONTACTS

Selnaustrasse 30
CH-8021 Zurich
P +41 (0)58 399 5300
stoxx@stoxx.com
www.stoxx.com

Frankfurt: +49 (0)69 211 13243
Hong Kong: +852 6307 9316
London: +44 (0)20 7862 7680
Madrid: +34 (0)91 369 1229
New York: +1 212 669 6426
Singapore: +65 9189 7970
Tokyo: +81 3 5847 8248

STOXX

INNOVATIVE.GLOBAL.INDICES

STOXX is part of Deutsche Börse and SIX

STOXX Ltd. is a global index provider, currently calculating a global, comprehensive index family of over 6,000 strictly rules based and transparent indices. Best known for the leading European equity indices EURO STOXX 50, STOXX Europe 50 and STOXX Europe 600, STOXX Ltd. maintains and calculates the STOXX Global Index family which consists of total market, broad and blue-chip indices for the regions Americas, Europe, Asia, and Pacific, the sub-regions Latin America and BRIC (Brazil, Russia, India and China), as well as global markets.

To provide market participants with optimal transparency, STOXX indices are classified in three different categories. The regular "STOXX" indices include all standard, theme and strategy indices that are part of STOXX's integrated index family and follow a strict rules-based methodology. The "iSTOXX" brand typically comprises less standardized index concepts that are not integrated in the STOXX Global Index Family, but are nevertheless strictly rules-based. While indices that are branded "STOXX" and "iSTOXX" are developed by STOXX for a broad range of market participants, the "STOXX Customized" brand covers indices that are specifically developed for clients and do not carry the STOXX brand in the index name."

The STOXX indices are licensed to over 400 companies around the world as underlyings for Exchange Traded Funds (ETFs), Futures & Options, Structured Products and passively-managed investment funds. Three of the top Exchange Traded Funds (ETFs) in Europe and 30 percent of all assets under management are based on STOXX indices. STOXX Ltd. holds Europe's number one and the world's number three position in the derivatives segment.

In addition, STOXX Ltd. is the marketing agent for the indices of Deutsche Boerse AG and SIX, amongst them the DAX and the SMI indices.

STOXX Ltd. is part of Deutsche Boerse AG and SIX.

www.stoxx.com