May 2020

INTRODUCING STOXX® FACTOR AND ESG-X FACTOR INDICES: GET MORE FROM YOUR PREMIA EXPOSURES

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1. INTRODUCTION

Qontigo has introduced a new series of factor-based indices known as the STOXX® Factor Indices. These are designed for investors who want to take advantage of the benefits of reaping factor premia while avoiding the noise that pervades many other such products that allow undesired exposures to other factors.

There are three major goals that guide the philosophy behind the STOXX® Factor Indices:

» **Robustness**, meaning that the indices are built using institutionally accepted and academically validated factors that have clear economic rationales for their effectiveness;

» **Explicitly targeted exposures**, to avoid the unintended bets that plague many competing products;

» **Tradability of component stocks**, thereby avoiding the excessive costs that can accompany trading of illiquid names.

Factors are measurable characteristics that explain portfolio risk (how much return is expected to deviate from that of an underlying benchmark) and can produce excess returns over the long run. There is extensive literature validating the benefits of investing in factor premia, and numerous investors pursue those excess returns.

Many current products use heuristic rules, for example buying the top 20% of companies based on a factor, and weighting the stocks equally, by the strength of the 'signal', or by their market capitalization. The main problem with this approach is that the portfolios end up with unintended, possibly unwanted exposures to other factors that can have a significant impact on returns. We have written extensively on the pitfalls of this kind of portfolio construction.[1]

2. THE QONTIGO BENEFIT

The STOXX® Factor Indices, in contrast, seek to reduce exposure to all sources of portfolio risk except the desired factor. For example, a Value portfolio would not have a large overweight position in financial stocks, or a Momentum portfolio would not have a large overweight position in high Volatility stocks. In this way we ensure that the factor – the expected driver of portfolio return – is actually the real source of return.

Factor definitions are the same as those used by Axioma Factor Risk Models, which ensures robustness, and portfolios are built and evaluated using Axioma's portfolio construction tools – the Axioma Portfolio Optimizer™ and Axioma Portfolio Analytics™ – to make sure that the indices deliver the right, or intended, factor exposures. The index construction process also ensures liquidity and investability of the indices. By employing established, commercially accepted factor definitions, and clear, transparent index construction rules, the STOXX® Factor Indices set a high industry standard for factor indices.

[1] See, for example, "What's in a Name? In the Case of Smart Beta, It's Hard to Tell", "What's in a Name? Part 2: Stress-Testing Smart Beta ETFs", and "What, Exactly, Is a Factor?"

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In total there are 30 STOXX® Factor indices[2]: five individual Factor indices and one Multi-Factor index for each of six regions (the US includes two universes). Table 1 details the benchmarks and corresponding risk model.

TABLE 1: Six Regions, Seven Benchmarks and Six Risk Models

Region	Underlying Benchmark	Axioma Medium-Horizon Fundamental Risk Model
US	STOXX USA 900, STOXX USA 500	US4
Europe	STOXX Europe 600	EU4
Japan	STOXX Japan 600	JP4
Asia/Pacific	STOXX Asia/Pacific 600	AP4
Global	STOXX Global 1800	WW4
Global ex-US	STOXX Global 1800 ex US	WWxUS4

Source: Qontigo

Each of the five Single-Factor indices chooses from the stocks in the benchmark universe to maximize exposure to the index factor and constrain exposure to other risk model styles and industry factors. The target factor may be a single metric or a combination of several metrics. Table 2 shows the five key themes targeted by the STOXX® Factor indices, the risk model factors that define the portfolio tilt, the direction of the tilt, and the metrics that define the factor. Table 3 lists the constraints used in the construction of the portfolio.

TABLE 2: Factor Definitions

Factor	Axioma Risk Model Factor	Descriptor
Value	(+) Value	» Book-to-Price
	(+) Earnings Yield	» Realized Earnings-to-Price
		» Forecast Earnings-to-Price
Momentum	(+) Medium-Term Momentum	» Cumulative return over the last year excluding the most recent month
Size	(–) Size	» Natural logarithm of issuer market capitalization
Low Risk	(–) Volatility	» Residual volatility
	(–) Market sensitivity	» Market beta
Quality	(+) Profitability	» Return on Equity
		» Return on Assets
		» Cash Flow to Assets
		» Cash Flow to Income
		» Gross Margin
		» Sales to Assets
	(–) Leverage	» Debt-to-Asset
		» Debt-to-Equity

Source: Qontigo

[2] In addition to these 30, there are ESG factor indices variants, as described below.

TABLE 3: Summary of Index Construction Rules

Constraint	Single-Factor	Multi-Factor
Predicted tracking error <5%	✓	✓
Active industry and country exposure limit[3]: ±5%	✓	✓
Active non-targeted style factor exposure[4]: ±0.25 standard deviations	✓	✓
Capping limit[5]: 4.5/8/35	✓	✓
One-way turnover per rebalance: 12.5%	✓	✓
Threshold asset limit[6]: 0.03%	✓	✓
Maximum number of names: 25% of the parent index	✓	✓
Minimum effective number of names: >30% of the parent index	✓	✓
Maximum individual asset weight: <20 times the parent index	✓	✓
Maximum weighted days to trade (WDTT) of two bottom liquidity quintiles: 10 times the benchmark	✓	✓
No trading in stocks with missing or zero trading volume	✓	✓
No individual wrong-sign target style exposures	–	✓
No overweight in stocks in the worst 5% of the five targeted style factors	–	✓

Source: Qontigo

All indices are rebalanced quarterly in December, March, June and September. For more detail on the construction methodology, visit our paper "STOXX® Factor Indices: Targeted Factor Exposures with Managed Liquidity and Risk Profiles".

3. ADVANTAGE OF A MULTI-FACTOR APPROACH

A simple way to diversify across factors could be to invest in multiple single-factor portfolios according to the desired weights. However, academic and practitioners' literature largely agrees that this is an inefficient way of exploiting factor diversification. A more effective way is to 'integrate' different factor scores into a single multifactor score, and then construct the portfolio to maximize exposure to that multifactor 'alpha'. The STOXX® Factor Indices follow this second route to construct multifactor indices that offer a diversified exposure to the individual factors, while delivering a superior risk-return profile. The Multi-Factor index is built in two steps. The first is to compute, for every security at each rebalancing date, an aggregate multifactor score which is defined as the average of the individual factor scores. The portfolio construction process then seeks to maximize exposure to the multifactor score, and, as for the Single-Factor indices, constrains undesired exposures.

Of course, having a Multi-Factor index does not mean that Single-Factor indices are not desirable. In most cases they offer attractive risk premia, diversification benefits and the ability to time factors.

[3] Industry classifications are from ICB: https://www.stoxx.com/sector-classification-icb.

[4] For Low Volatility, we constrain all risk model style factors except Volatility and Market Sensitivity. For Quality, we constrain all risk model style factors except Profitability and Leverage. For Size, we constrain all risk model style factors except Size. For Momentum, we constrain all risk model style factors except Medium-Term Momentum. For Value, we constrain all risk model style factors except Value and Earnings Yield. These constraints are not applied to the Multifactor indices.

[5] This constraint is a diversification rule. It means that the weight of a single company cannot be larger than 8%, while the sum of the companies with a weight larger than 4.5% cannot be larger than 35%. This is a slightly more conservative version of the '5/10/40' rule for UCITS funds.

[6] That is, an asset's weight must be at least 3 basis points to be in the portfolio at rebalance.

4. PERFORMANCE – HIGHER RETURNS, LOWER VOLATILITY, OR BOTH IN MOST CASES

The portfolios that result from maximizing exposure to each individual factor or the multifactor alpha, with the constraints set out above, produced strong risk-adjusted returns over the course of backtests run monthly from December 2001 through December 2019. The full set of results[7] can be found in the paper cited above. Below we summarize them in risk-return space[8].

» Every factor portfolio produced a higher return over the test period than did the corresponding benchmark, with the exception of Value in the Global market, where the returns were equal, and Value in Europe, where the return was slightly lower. This was even the case for the far-lower-volatility Low Risk indices.

» In every region except Japan, the Multi-Factor index outpaced all the single-style portfolios as well as the benchmark. In Japan, Size outpaced Multi-Factor. In Europe and Asia/Pacific, Multi-Factor also produced the highest Sharpe ratio. Low Risk took that honor in the US, Europe and Japan, a result of its far lower volatility.

» The other single-factor portfolios also produced higher Sharpe ratios than their associated benchmark, with the exception of Value and Size in Asia, where high volatility dampened the impact of the higher return.

» Momentum had a good Sharpe ratio in Europe, with similar volatility to the underlying benchmark. In the US, Asia, Japan and Global indices, Momentum's Sharpe ratio was higher despite the higher volatility as the returns were commensurately strong. Quality had higher risk than the benchmark in the US and Global indices, but higher returns also produced a better Sharpe ratio. In Asia and Europe, Quality's volatility was similar to the benchmark.

» In general, the Size portfolios (smaller stocks) had both higher returns and higher volatility, leading to Sharpe ratios similar to those of the benchmark index in Global, Europe and Asia, but higher in the US and Japan.

[7] Results in the paper cited are calculated through August 2019 and have been updated for this paper.
[8] To save space we did not include the results for the Global ex-US indices, but they also fared well.

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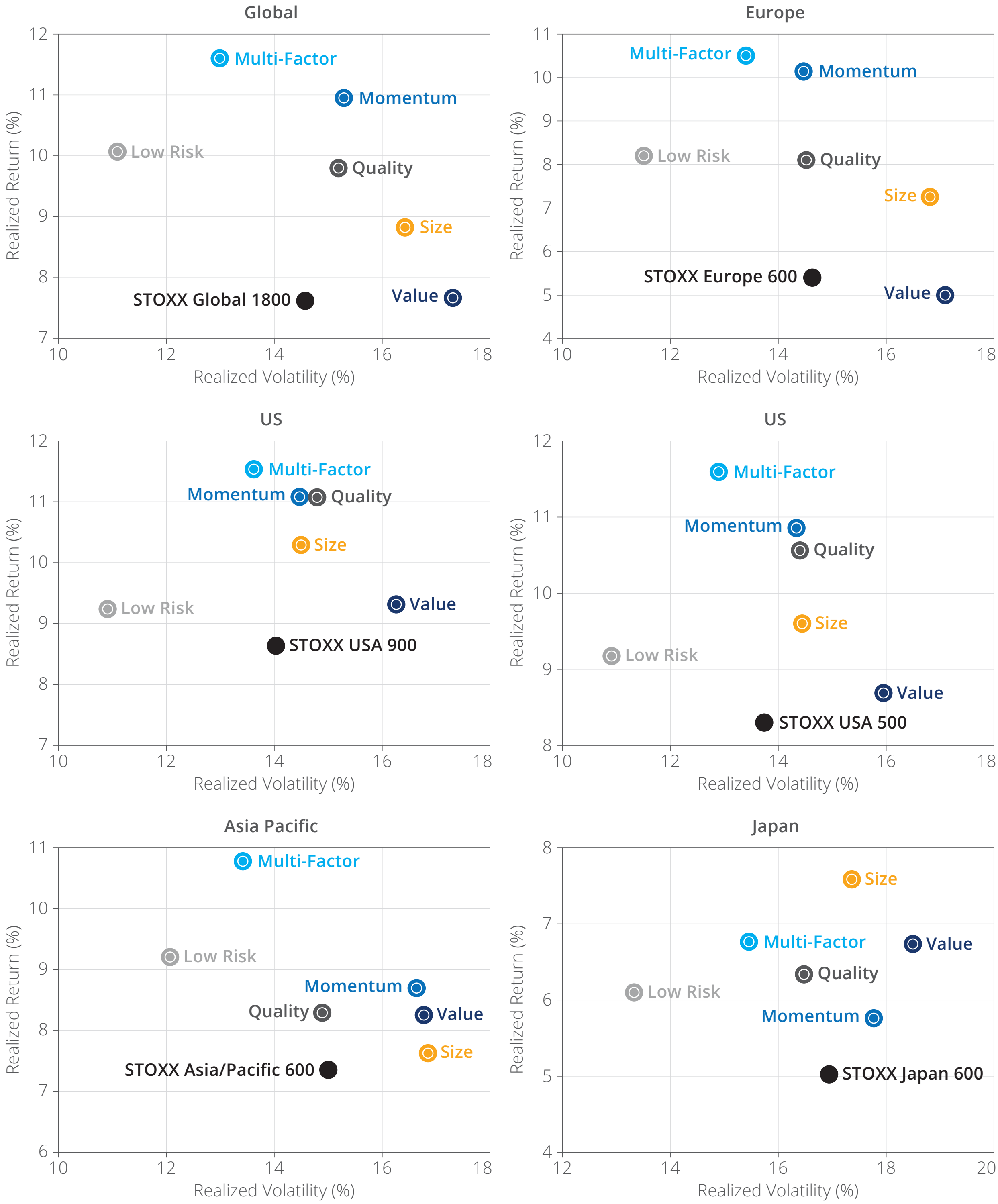
Exhibit 1: Risk and Return for STOXX® Factor Indices – Full Backtest Period (December 2001 – December 2019)



Source: Qontigo. Data prior to index launch simulated.

Many more performance measurements are included in our longer paper. Overall, factor indices came out well on most of them.

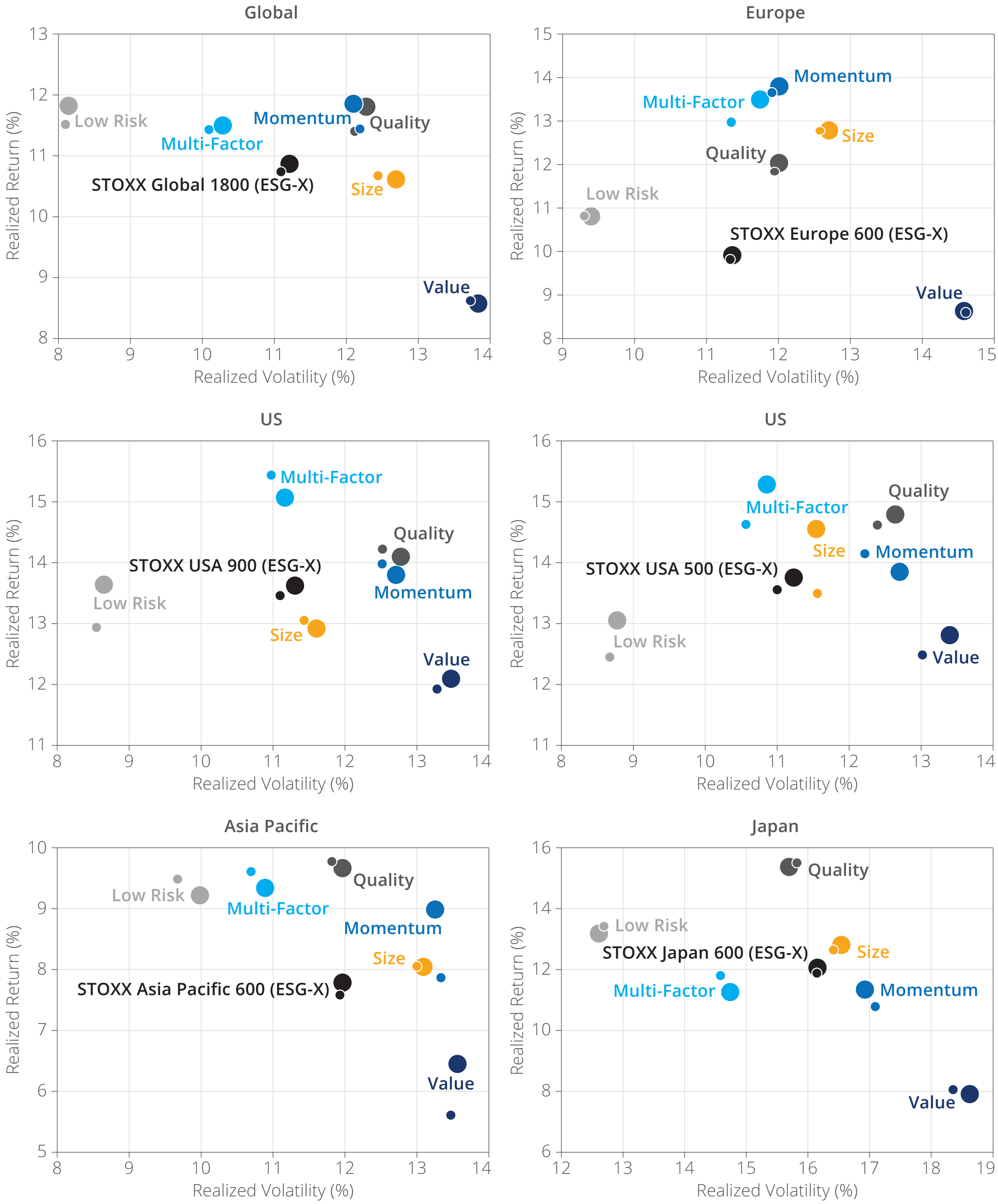
5. ESG: AN ADDED 'TWIST'

In addition to the standard set of factor indices described above, STOXX this month extended the concept to create a parallel set of portfolios that use as their base the STOXX® ESG-X Indices. The ESG-X indices start with STOXX flagship benchmark indices but filter out stocks that do not meet certain norm- and product-based criteria that reflect the environmental, social and governance (ESG) principles of large asset owners. These include companies deemed in breach of the Global Standards Screening[9] and those that are involved in controversial weapons, thermal coal and tobacco. The exclusionary screens are based on data from Sustainalytics. For more detail about these indices, see our papers "STOXX® ESG-X Indices", "STOXX® USA 500 ESG-X Index" and "STOXX® Europe 600 ESG-X Index – Analyzing ESG Exclusions". The new STOXX® ESG-X Factor Indices are built using the exact same portfolio construction methodology as the standard factor indices described above – they just start with this slightly smaller ESG-compliant universe as a base.

The parent ESG-X indices exclude 3%–9% of the weight of benchmarks, but still maintain a similar risk-return profile. Similarly, the risk-return profile for the ESG-X Factor indices varies only fractionally from that of the standard factor indices built from the standard benchmarks. In Exhibit 2 we show simulated returns and volatilities for the ESG-X Factor indices from March 2012 through December 2019, with the larger marker representing the ESG variant and the smaller one its standard counterpart. Overall, risk levels were ever-so-slightly higher for the ESG versions while returns were quite similar. In some cases, they were slightly better or a bit worse, while for some the risk-return picture was exactly the same.

[9] Sustainalytics' Global Standards Screening identifies companies that violate or are at risk of violating commonly accepted international norms and standards, enshrined in the United Nations Global Compact (UNGC) Principles, the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises, the UN Guiding Principles on Business and Human Rights (UNGPs), and their underlying conventions.

Exhibit 2: Risk and Return for STOXX® Factor and ESG-X Factor Indices, and Benchmarks, March 2012 – December 2019



Source: Qontigo. Data prior to index launch simulated. Benchmark pairs consist of flagship indices (small marker) and their respective ESG-X versions (larger marker).

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Some other observations:

» Whereas Multi-Factor or Momentum produced the highest returns in each one of the ESG-X Factor Portfolios (except Asia/Pacific and Japan, where Quality had the highest return), Low Risk portfolios were able to generate the highest Sharpe ratios in all regions (in Europe, Low Risk, Momentum and Multi-Factor had equivalent Sharpe ratios), owing to significantly lower levels of volatility as compared with the other ESG-X Factor indices. Low Risk active return was close to zero in the USA 900 portfolio (so it met the market's return with substantially lower risk), and the factor underperformed in the USA 500 portfolio, but the strategy did outperform the benchmark in other regions

» In contrast, Value produced the lowest Sharpe ratios across the regions, driven by both lower return and higher volatility than the other factor indices. In this period, shorter than the time frame used to evaluate the standard (non-ESG) factor indices, Value also lagged the market in each region, where the market was defined as the appropriate ESG benchmark. On a positive note, ESG Value's returns and Sharpe ratios were roughly the same as or higher than those for standard Value in all regions.

» Other than Size and Value in the USA 900 and Global portfolios, Value and Low Risk in the USA 500, Value in Europe and Asia, and Multi-Factor, Momentum and Value in Japan, the ESG-X Factor portfolios in all regions beat their ESG market benchmarks. The Size portfolio fared particularly well in Europe.

6. CONCLUSION

We have built a set of standard indices that use well-known and extensively tested factors to provide targeted exposures for an investor, while simultaneously avoiding unwanted portfolio bets. At the same time, the indices are constructed with sufficient liquidity to avoid giving back all the potential gains in trading costs. For investors who prefer to incorporate ESG principles into their process, we have also created ESG-compliant versions of these factor indices that produced very similar risk-return profiles to their standard counterparts. This indicates that incorporating ESG principles does not mean sacrificing returns, whether actual or risk-adjusted.

We believe our portfolio construction methodology provides the best means of achieving all the benefits of factor investing without many of the pitfalls that come from products currently on offer, and that process can be equally as effective in an ESG-screened universe.

[10] As the time period tested for the ESG factor indices was different from that of the standard factor indices some of the relative-performance conclusions may differ from the points made about the standard indices above.

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About STOXX Ltd.

STOXX Ltd. is a global index provide that currently calculates a global, comprehensive index family of over 10,000 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 Americas, Europe and Asia/Pacific regions and the Latin America and BRIC (Brazil, Russia, India and China) sub-regions, as well as global markets.

To provide market participants with optimal transparency, STOXX indices are classified into four categories. 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 “STOXX” and “iSTOXX” brand indices 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 include the STOXX brand in the index name. STOXX uses the Omnient brand to offer custom indices from its existing index universe.

STOXX indices are licensed to more than 600 companies around the world as underlyings for Exchange Traded Funds (ETFs), futures and options, structured products and passively managed investment funds. Three of the top ETFs in Europe and approximately 25% of all assets under management are based on STOXX indices. STOXX Ltd. holds Europe's number one and the world's number two position in the derivatives segment.

Since September 2019 STOXX is part of Qontigo.

Qontigo is a financial intelligence innovator and a leader in the modernization of investment management, from risk to return. The combination of the company’s world-class indices and best-of-breed analytics, with its technological expertise and customer-driven innovation enables its clients to achieve competitive advantage in a rapidly changing marketplace. Qontigo’s global client base includes the world’s largest financial products issuers, capital owners and asset managers. Created in 2019 through the combination of STOXX, DAX and Axioma, Qontigo is part of Deutsche Börse Group, headquartered in Eschborn with key locations in New York, Zug and London.

Qontigo’s index provider STOXX is part of Deutsche Börse Group, and the administrator of the DAX indices under the European Benchmark Regulation.

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