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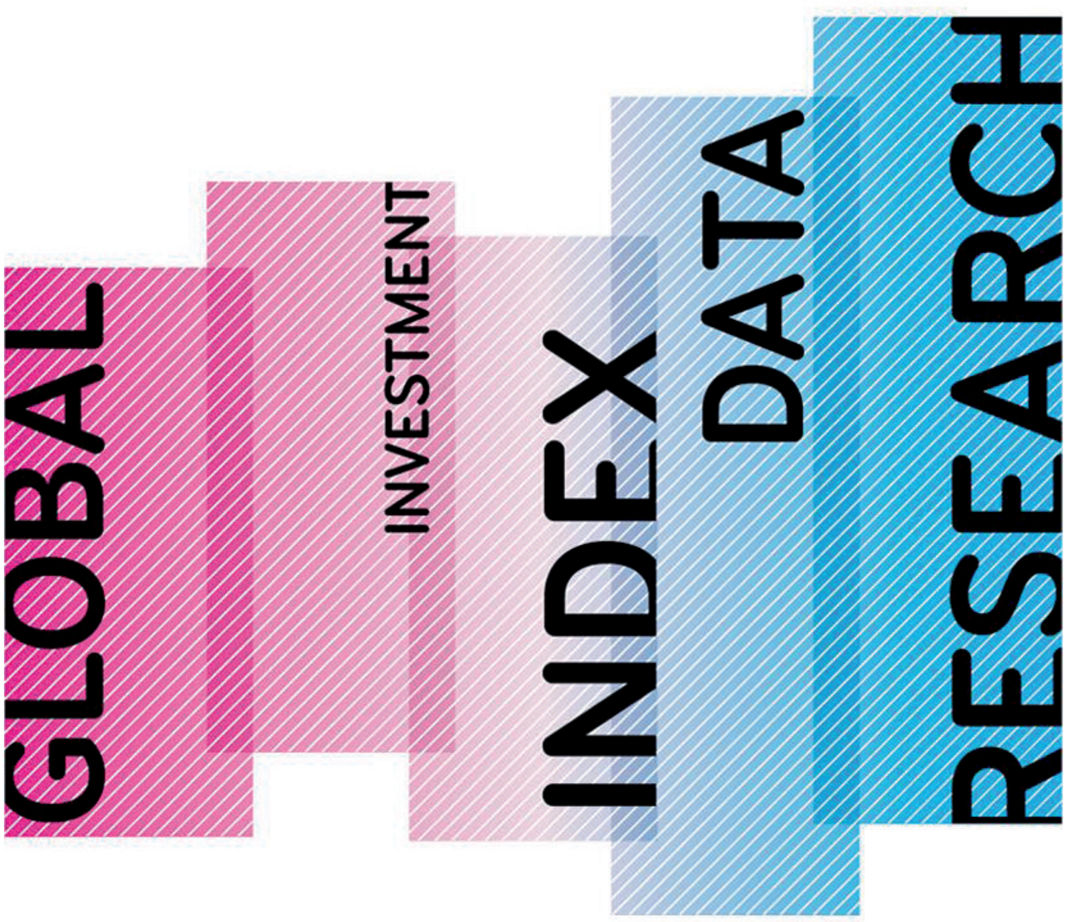
STOXX® EUROPE 600 ESG-X INDEX – ANALYZING ESG EXCLUSIONS

Anand Venkataraman, Head of Product Management & Willem John Keogh, Senior Product Development Manager, STOXX Ltd.



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INTRODUCTION

Sustainable investing has been gaining prominence and popularity among investors, institutional and retail alike. Our article ESG Surveys Point to Widespread Adoption sheds more light on the results from some of the recent surveys that show increasing adoption, but also highlight some challenges to adopting environmental, social and governance (ESG) considerations in investing. Regulations and legislations are also playing their part in "reforming" the financial system to push ESG principles in the corporate world as noted in our article earlier in 2018, European Union Plans Push to ESG Investments.

As asset owners discharge their fiduciary role of responsible investors on the face of increasingly aware investors and an evolving legislative landscape around ESG, they are looking for solutions beyond the traditional market-capitalisation weighted indices. Whilst implementing ESG considerations in investment decision making, investors typically end up creating portfolios that diverge from standard benchmarks, in terms of their characteristics and performance, resulting in unintended exposures and therefore risks, as well as tracking error and additional management costs. In this research, we attempt to analyze the recently launched STOXX® Europe 600 ESG-X Index in order to better understand its characteristics and performance versus the STOXX Europe 600 index in regards to its suitability for passive investment strategies.

SUSTAINABLE AND RESPONSIBLE INVESTING IN PRACTICE

Globally, there is nearly $23 trillion managed professionally under Sustainable and Responsible Investment (SRI) strategies, according to the Global Sustainable Investment Alliance (GSIA). SRI has been growing at an annual rate of 14.6% globally between 2012 and 2016, with Europe being at the forefront with more than half the share of the total global assets managed under SRI.

FIGURE 1: GROWTH OF SRI ASSETS BY REGION 2012–2016

Region	2012 ($ bn)	2014 ($ bn)	2016 ($ bn)	Compound annual growth rate
Europe	8,758	10,775	12,040	8.3%
United States	3,740	6,572	8,723	23.6%
Canada	589	729	1,086	16.5%
Australia/New Zealand	134	148	516	40.1%
Asia ex Japan	40	45	52	7.6%
Japan	0	7	474	724.0%
Total	**13,261**	**18,276**	**22,890**	**14.6%**

Source: 2016 Global Sustainable Investment Review, 2014 Global Sustainable Investment Review

According to the GSIA, sustainable investing encompasses the following approaches[1]:

1. **Negative/exclusionary screening:** the exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria;
2. **Positive/best-in-class screening:** investment in sectors, companies or projects selected for positive ESG performance relative to industry peers;
3. **Norms-based screening:** screening of investments against minimum standards of business practice based on international norms;

[1] Global Sustainable Investment Review 2016

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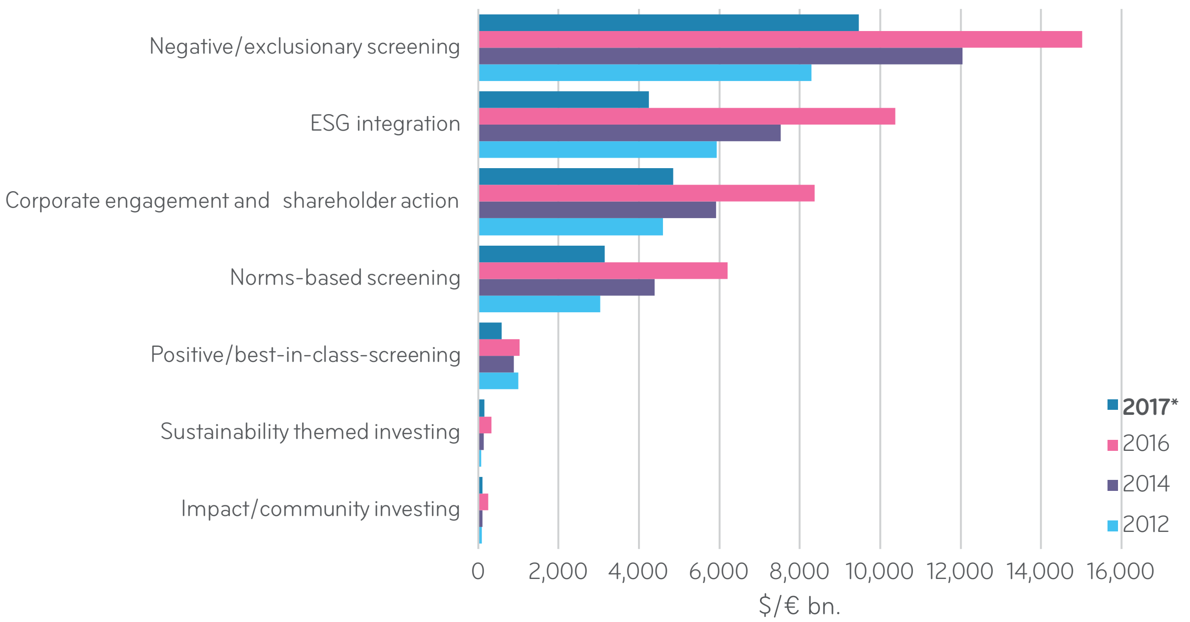
4. **ESG integration:** the systematic and explicit inclusion by investment managers of environmental, social and governance factors into financial analysis;
5. **Sustainability themed investing:** investment in themes or assets specifically related to sustainability (for example clean energy, green technology or sustainable agriculture);
6. **Impact/community investing:** targeted investments, typically made in private markets, aimed at solving social or environmental problems, and including community investing, where capital is specifically directed to traditionally underserved individuals or communities, as well as financing that is provided to businesses with a clear social or environmental purpose; and
7. **Corporate engagement and shareholder action:** the use of shareholder power to influence corporate behavior, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines.

All these seven approaches aim at increasing the sustainability of a portfolio. However, they differ substantially with regard to intentions. While negative and positive screening as well as norm-based investing only aim at increasing sustainability, community investing and corporate engagement approaches additionally aim at improving the status quo.

FIGURE 2: GROWTH OF SRI APPROACHES 2012–2016



Note: *Data for 2017 pertains to Europe with amounts in €bn; source: EUROPEAN SRI STUDY 2018 by EuroSIF
Sources: Global Sustainable Investment Review, 2016, Global Sustainable Investment Review, 2014

According to GSIA, negative/exclusionary based approaches have not only accumulated the most SRI assets over the years, but also been growing at a rapid pace compared with the other SRI approaches. Negative/exclusionary screening is perhaps one of the oldest SRI approaches, due to the simplicity and transparency of carving out entire countries, sectors or individual companies from an investor's portfolio. The top exclusion criterion seems to be controversial weapons, with tobacco following suit and some others becoming prominent as well.

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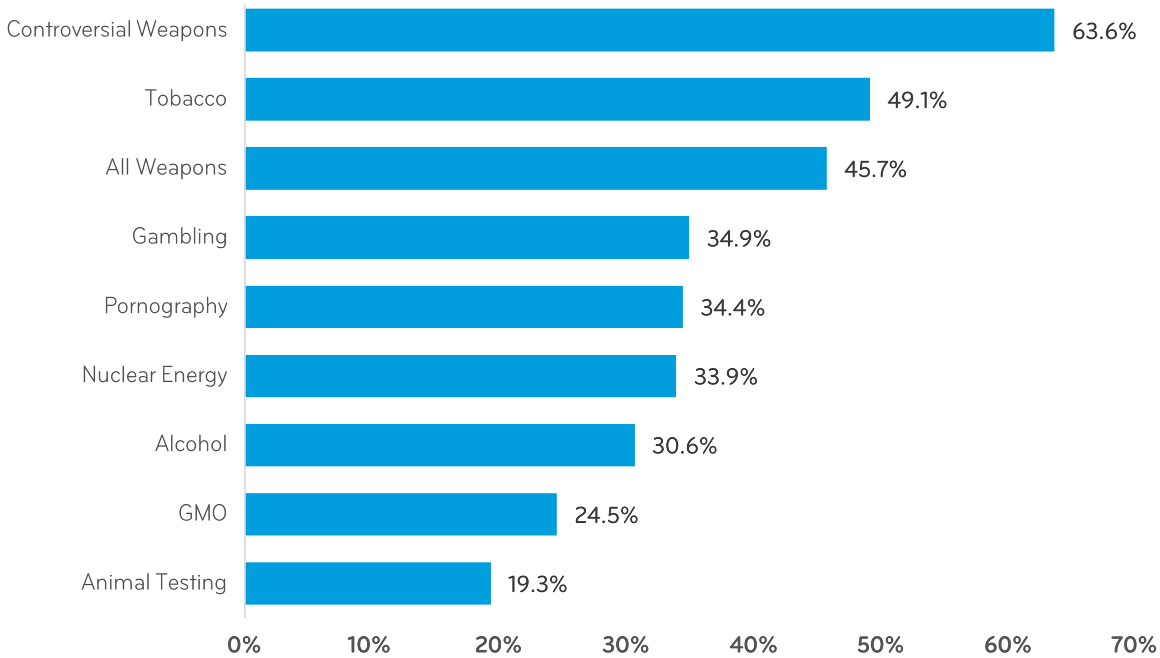
FIGURE 3: TOP EXCLUSION CRITERIA



Sources: EUROPEAN SRI STUDY 2018 by EuroSIF

Although such exclusionary approaches are easy to explain to the end investor, thereby removing or reducing the subjectivity surrounding SRI concerns, they frequently tend to introduce unforeseen biases that pose practical challenges Negative/exclusionary screens may also result in performance and diversification sacrifices.

THE STOXX EUROPE 600 ESG-X INDEX

OVERVIEW

STOXX has been facilitating SRI since 2011 with indices that select the best-in-class performers on ESG metrics, targeting a sustainability-weighted strategy. However, to fulfill the benchmarking objectives/requirements of the large negative/exclusionary SRI asset base in Europe, STOXX recently launched the STOXX® Europe 600 ESG-X Index, a version of Europe's popular benchmark, that excludes companies based on norm- and product-based screenings, thus complying with SRI policies of typical investors.

The new index is built from the constituents of the STOXX Europe 600 Index, but exclude those constituents involved in the following business activities:

- in breach of any of the 10 United Nations Global Compact principles of human and labor rights, the environment, business ethics and anti-corruption,
- that produce or distribute controversial weapons,
- are tobacco manufacturers, or
- extract or consume thermal coal.

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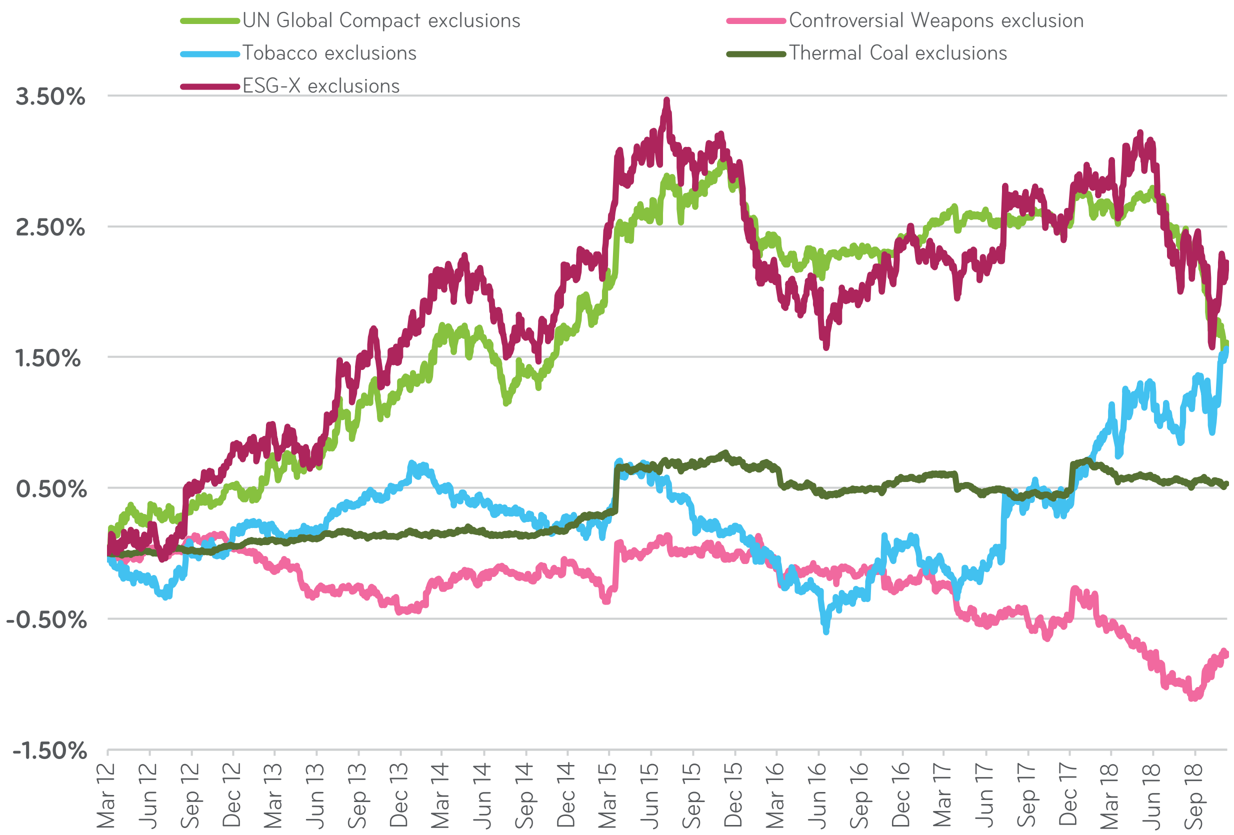
The STOXX Europe 600 ESG-X shares the same rules, sector composition and methodology – including the same transparent free-float market-cap weighting scheme – as the STOXX Europe 600 index which is a broad pan-European equity index containing the largest and the most frequently traded equity securities. A fast-exit rule in the new index secures a swift response to any ESG breach by quickly removing offenders, limiting investors' risks.

EXCLUSION CRITERIA AND THEIR IMPACT IN ISOLATION

A set of exclusion criteria are applied to an initial universe of stocks, that comprises of all stocks from the STOXX Europe 600 Index. The exclusion criteria follow the UN Global Compact Compliance Principles, a set of definitions for controversial weapons, tobacco and coal. The sections below provide more detail on the exclusions, and a performance summary of the STOXX Europe 600 portfolio[2] incorporating the exclusions one at a time.

FIGURE 4: CUMULATIVE IMPACT OF EXCLUSIONS ON TOTAL RETURNS



Source: STOXX Ltd., data as of 27-Nov-2018

[2] Please note that these are simply portfolio simulations carried out to analyze the impact of each exclusion separately, and are currently not available as indices.

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Global compact compliance

The STOXX Europe 600 ESG-X Index excludes companies that Sustainalytics considers to be non-compliant with the UN Global Compact Compliance Principles. Sustainalytics has defined five ESG risk levels ranging from 1 (low risk) to 5 (very high risk), with level 5 companies considered non-compliant with the global compact principles.

Exclusion based on Un Global Compact Principles has typically resulted in large underweighting of oil & gas, banks and healthcare sectors, with moderate underweighting to basic resources, automobiles and industrial goods & services sectors in the past (see figure A1 in the appendix for historic underweights to the sectors). However, this exclusion has added nearly 1.61% cumulative returns since inception over the STOXX Europe 600 Index, translating to 15bp of annualised returns, while only increasing the annualised volatility marginally by 0.01% (figure 5). The exclusions however, have contributed negatively over the most recent 1-year and 3-year periods, without much impact on volatility.

Controversial weapons

The STOXX Europe 600 ESG-X Index excludes companies that Sustainalytics identifies to be involved with controversial weapons. The following weapons are considered controversial: anti-personnel mines, biological and chemical weapons, cluster weapons, depleted uranium, nuclear weapons and white phosphorus weapons.

The criteria for determining involvement are:

» Internal production or sale of controversial weapons

» The ultimate holding company owns greater than 10% of voting rights of an involved company

» Greater than 10% of voting rights of a company is owned by the involved company

Exclusion of companies involved in controversial weapons has resulted in a significant underweight to the industrial goods & services sector, with some exclusions between 2012 – mid 2013 from the Automobiles & Parts sector as well (see figure A2 in the appendix for historic underweights to the sectors). The exclusion of stocks based on controversial weapons has resulted in a drag of 0.76% cumulative returns since inception over the STOXX Europe 600 Index, translating to drag of 7bp, while decreasing the annualized volatility marginally by 0.01% (figure 5). However, the impact of exclusions on volatility has been a bit more pronounced over the last year or so with reduction of 0.05%.

Tobacco

The STOXX Europe 600 ESG-X Index excludes companies that Sustainalytics identifies to be tobacco producers, with a 0% revenue threshold, that is a company deriving any revenue from tobacco production.

Exclusion of companies identified to be tobacco producers has, as one would expect, resulted in significant underweight to personal & household goods ICB sector (see figure A3 in the appendix for historic underweights to the sectors). The exclusion of tobacco producing stocks has added 1.56% cumulative returns since inception over the STOXX Europe 600 Index, translating to 15bp of annualized returns, while also increasing the annualized volatility by 0.08% (figure 5).

Excluding tobacco producers has consistently improved the returns even in the recent 1-year, 3-year and 5-year periods, though simultaneously increasing annualized volatility by 0.06%-0.09%. However, the addition to returns and the increase in volatility is not entirely due to the exclusion of tobacco stocks but is largely driven by country and currency factors (see figure 4 and figure 12). The majority of the weight within tobacco industry comprised of UK listed stocks denominated in GBP, and the depreciation of GBP against the EUR following the EU referendum in 2016 helped avoid underperforming stocks in the ESG-X index denominated in EUR.

Thermal coal

The STOXX Europe 600 ESG-X Index excludes companies that Sustainalytics identifies to have:

» greater than 25% revenues from thermal coal extraction (including thermal coal mining and exploration)

» greater than 25% power generation capacity from coal-fired electricity, heat or steam generation capacity/thermal coal electricity production (including utilities that own/operates coal-fired power plants).

Exclusion of companies based on thermal coal production or consumption has, as one would expect, resulted in significant underweight to the utilities sector (see figure A4 in the appendix for historic underweights to the sectors). The exclusion of thermal coal related stocks has added nearly 0.53% cumulative returns since inception over the STOXX Europe 600 Index, translating to 5bp in annualized returns, while only increasing the annualized volatility by 0.01% (figure 5). Excluding thermal coal related stocks has had a variable impact on returns during recent periods, with very minimal or no impact on annualized volatility.

FIGURE 5: PROFORMA STATISTICS OF STOXX EUROPE 600 PORTFOLIOS INCORPORATING EXCLUSIONS

STOXX EUROPE 600 GROSS RETURN INDEX

Attribute	Index	ex UN Global Compact	ex Controversial Weapons	ex Tobacco	ex Thermal Coal
Since inception (cumulative return)*	65.624%	67.235%	64.861%	67.182%	66.158%
Since inception return	7.623%	7.775%	7.551%	7.770%	7.673%
5y return	5.267%	5.274%	5.233%	5.381%	5.312%
3y return	0.999%	0.705%	0.857%	1.276%	0.948%
1y return	-3.934%	-4.371%	-4.093%	-3.226%	-3.874%
Since inception volatility	14.764%	14.765%	14.751%	14.845%	14.768%
5y volatility	15.188%	15.182%	15.181%	15.252%	15.193%
3y volatility	14.334%	14.323%	14.317%	14.417%	14.334%
1y volatility	11.360%	11.370%	11.313%	11.426%	11.364%
Since inception Sharpe ratio	58.349%	59.279%	57.909%	59.030%	58.654%
5y Sharpe ratio	40.984%	41.028%	40.779%	41.559%	41.253%
Since inception max drawdown	24.930%	24.705%	24.889%	25.261%	24.844%
5y max drawdown	24.930%	24.705%	24.889%	25.261%	24.844%

* Except for Since inception cumulative returns, all returns and volatilities are annualised.
Source: STOXX Ltd. Data calculated using gross return index versions as of 27-Nov-2018.

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STOXX EUROPE 600 ESG-X INDEX PROFILE AND PERFORMANCE

The exclusion criteria detailed earlier had an impact of underweighting certain sectors that, as it turns out, were mutually exclusive. Such exclusions result in an index that has an underweight to different sectors: oil & gas, banks, industrial goods & services, personal & household services, healthcare, basic resources, utilities, and automobiles & parts (see figure 7). Consequently, the other remaining sectors get overweight due to the reallocation of weights from the underweighted sectors listed earlier.

Overall, the exclusions added 2.48% cumulative returns since inception over the STOXX Europe 600 Index, translating to 22.3bp in annualized returns, while increasing the annualised volatility by 0.06%. Over the recent 1y, 3y and 5y periods however, the ESG-X index has trailed the STOXX Europe 600 index.

FIGURE 6: STOXX EUROPE 600 ESG-X INDEX STATISTICS

Attribute	STOXX Europe 600 ESG-X Index	STOXX Europe 600 Index
Since inception (cumulative return)*	68.100%	65.624%
Since inception return	7.846%	7.623%
5y return	5.254%	5.267%
3y return	0.718%	0.999%
1y return	-4.684%	-3.934%
5y volatility	15.232%	15.188%
Since inception volatility	14.824%	14.764%
3y volatility	14.379%	14.334%
1y volatility	11.372%	11.360%
Since inception Sharpe ratio	59.528%	58.349%
5y Sharpe ratio	41.684%	40.984%
Since inception max drawdown	25.046%	24.930%
5y max drawdown	25.046%	24.930%

* All returns and volatilities are annualized, except for since inception cumulative returns which is actual.
Source: STOXX Ltd. Data calculated using gross return index versions as of 27-Nov-2018.

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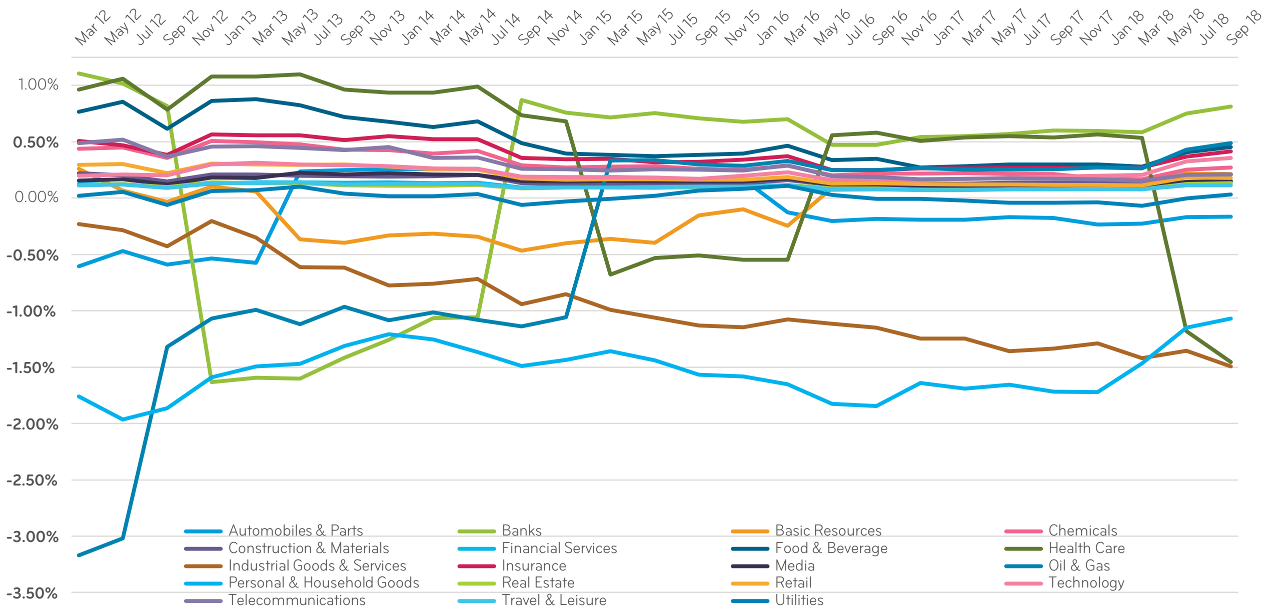
FIGURE 7: IMPACT OF EXCLUSIONS ON ICB SECTOR WEIGHTS



Source: STOXX Ltd., data as of 27-Nov-2018

FACTOR BASED PERFORMANCE ATTRIBUTION

We dissect the index profile and performance by carrying out a historic factor based performance attribution using Axioma Portfolio Analytics between the STOXX Europe 600 ESG-X Index as the portfolio versus the STOXX Europe 600 Index as the benchmark. Note that the annualized active returns (STOXX Europe 600 ESG-X Index return minus STOXX Europe 600 Index return) as obtained from Axioma is 0.204% versus the 0.223% using the official index returns. We believe that this return differential may be a result of slightly different treatment of corporate actions within Axioma as compared with the STOXX official methodology, as well as the fact that the Axioma attribution is carried out until Nov 30, 2018 whereas the actual index returns in Figure 6 are as of Nov 27, 2018. As such, we carry out the attribution acknowledging these differences and its likely impact on the attribution to be minimal.

The overall active return (STOXX Europe 600 ESG-X Index less STOXX Europe 600 index) of 0.204% is statistically insignificant at the 95% confidence level as observed from the t-stat value of 1.137, well below the threshold of 1.96. As can be seen from figure 8, neither the specific returns contribution of 0.098% nor the overall factor contribution of 0.105% nor any of the broad factors (style, country, industry, currency and market) contribute statistically significantly to the active returns. We may therefore conclude that the performance of the ESG-X is statistically not significantly different from that of the STOXX Europe 600 Index. This is important to understand and appreciate, since the STOXX Europe 600 ESG-X index excludes stocks from multiple sectors, and may therefore give the impression to the readers that the performance of the index might have been affected significantly by the exclusions.

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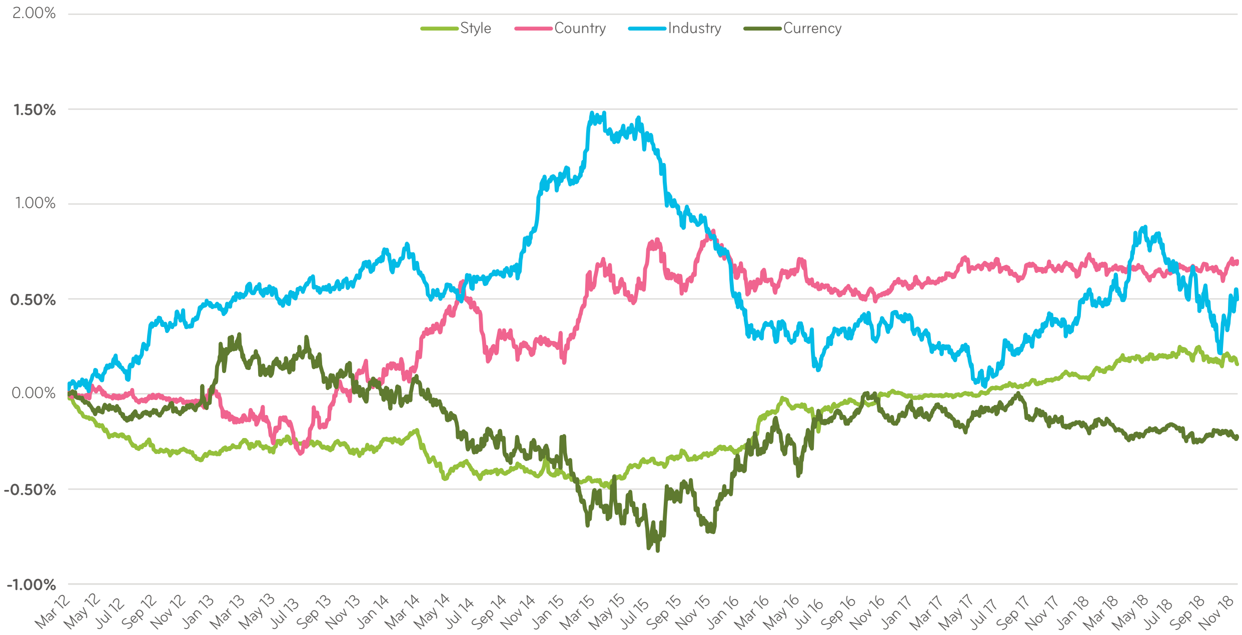
FIGURE 8: AXIOMA PERFORMANCE ATTRIBUTION FOR PERIOD 19-MAR-2012 TILL 30-NOV-2018

Source of Return	Contribution	Risk	T-Stat
Portfolio	**7.834%**	**14.717%**	
Benchmark	**7.630%**	**14.652%**	
Active	**0.204%**	**0.471%**	**1.137**
Specific return	0.098%	0.378%	0.685
Factor contribution	0.105%	0.296%	0.935
Style	0.015%	0.078%	0.495
Country	0.065%	0.165%	1.037
Industry	0.046%	0.188%	0.647
Currency	-0.021%	0.220%	(0.254)
Market	0.001%	0.002%	0.759

Source: Axioma Portfolio Analytics, STOXX Ltd.

Figure 9 shows the evolution of cumulative contribution of the various factors over time. Even though some of the factors have in the past had significant cumulative contribution to active return, over the longer term their cumulative contributions don't appear to have a systematic positive or negative contribution bias.

FIGURE 9: CUMULATIVE FACTOR CONTRIBUTIONS OVER TIME



Source: Axioma Portfolio Analytics, STOXX Ltd.

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Even though the broad factor contributions are not statistically significant, we analyze deeper to look at other sub-factors that may be statistically significant and attempt to interpret the results. Within "style", volatility as a sub-factor has had an overall annualized return contribution drag of (0.0377%), with positive average exposure of 0.4235%. This may likely explain the overall increase in annualized volatility of the STOXX Europe 600 ESG-X index by 0.06% over the STOXX Europe 600 Index. Oil and energy industries both display statistically significant contribution to active returns, with oil, gas & consumable fuels industry contributing far more significantly to the active returns with lower exposure to the sector on account of the exclusions.

FIGURE 10: STATISTICALLY SIGNIFICANT SUB-FACTOR CONTRIBUTIONS TO ACTIVE RETURNS (ATTRIBUTION FOR PERIOD 19-MAR-2012 TILL 30-NOV-2018)

Source of Return	Contribution	Avg Exposure	Risk	T-Stat
Portfolio	**7.834%**		**14.717%**	
Benchmark	**7.630%**		**14.652%**	
Active	**0.204%**		**0.471%**	1.137
Specific return	**0.098%**		**0.378%**	0.685
Factor contribution	**0.105%**		**0.296%**	0.935
Style	**0.015%**		**0.078%**	0.495
Leverage	0.015%	-0.0126	0.01%	2.796
Medium-term momentum	0.022%	0.0043	0.03%	2.293
Volatility	-0.038%	0.0042	0.04%	-2.661
Industry	**0.046%**	**0.000%**	**0.188%**	0.647
Energy equipment & services	-0.005%	0.05%	0.01%	-2.561
Oil, gas & consumable fuels	0.083%	-0.517%	0.067%	3.272

Source: Axioma Portfolio Analytics, STOXX Ltd.

Figure 11 shows the evolution of cumulative contribution of some of the sub-factors over time. As with the main factors (see figure 8), most of the sub-factors over the longer term don't appear to have a systematic positive or negative cumulative contribution bias, except for volatility and oil, gas & consumable fuels industry. As such, the exclusion of stocks does not seem to have either destroyed index performance, or altered its risk profile as compared to the benchmark, the STOXX Europe 600 Index.

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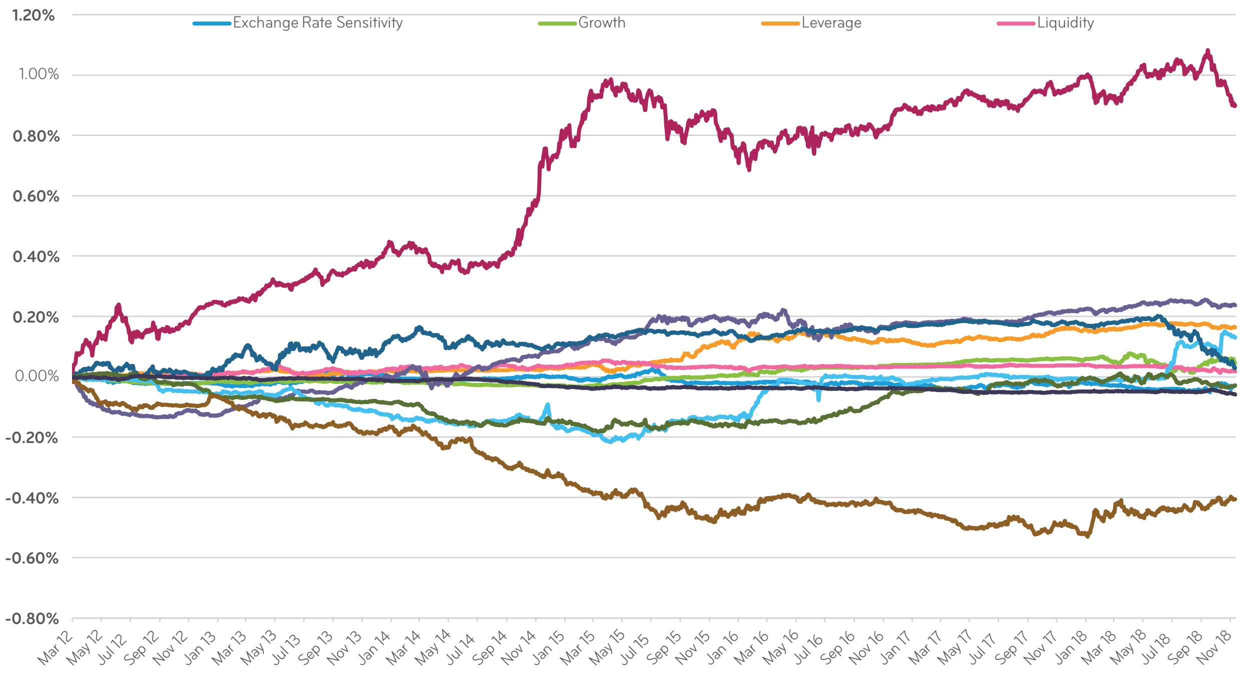
FIGURE 11: CUMULATIVE SUB-FACTOR CONTRIBUTIONS OVER TIME



Source: Axioma Portfolio Analytics, STOXX Ltd.

In terms of contribution to active risk which measures the volatility of active returns (tracking error as it is often called), the main drivers seem to be country, industry and currency. Some of the prominent contributors to active risk (for the purpose of this research paper defined as any factor contributing to more than 0.04%) are the lower average country exposure to United Kingdom and therefore GBP currency too, resulting in active risk contribution of 0.20% and 0.22% respectively. The lower average industry exposure to tobacco too contributes 0.15% to the active risk, besides other factors as noted in figure 12. Note that the various active risk components are not additive, as active risk itself is measured in units of standard deviation. The mathematical formula for calculation of active risk comprising various components is outside the scope of this research paper.

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FIGURE 12: SIGNIFICANT SUB-FACTOR CONTRIBUTIONS TO ACTIVE RISK (ATTRIBUTION FOR PERIOD 19-MAR-2012 TILL 30-NOV-2018)

Source of Return	Contribution	Avg Exposure	Risk	T-Stat
Portfolio	**7.834%**		14.717%	
Benchmark	**7.630%**		14.652%	
Active	**0.204%**		0.471%	1.137
Specific return	**0.098%**		0.378%	0.685
Factor contribution	**0.105%**		0.296%	0.935
Style	**0.015%**		0.078%	0.495
Size	0.003%	-1.081%	0.046%	0.160
Country	**0.065%**	**0.000%**	**0.165%**	1.037
Germany	0.004%	0.405%	0.045%	0.212
Switzerland	0.008%	0.702%	0.074%	0.302
United Kingdom	0.045%	-2.639%	**0.203%**	0.590
Industry	**0.046%**	**0.000%**	**0.188%**	0.647
Aerospace & defense	-0.043%	-1.396%	0.085%	-1.324
Oil, gas & consumable fuels	0.083%	-0.517%	0.067%	3.272
Pharmaceuticals	0.013%	0.309%	0.045%	0.748
Tobacco	-0.040%	-1.869%	**0.147%**	-0.713
Currency	**-0.021%**	**0.000%**	**0.220%**	-0.254
CHF	0.003%	0.706%	0.064%	0.110
GBP	-0.017%	-2.644%	**0.224%**	-0.206

Source: Axioma Portfolio Analytics, STOXX Ltd.

CONCLUSION

As we have seen earlier, SRI has been witnessing steady increase in assets at nearly 15% annual rate of growth between 2012 and 2016. Of all the SRI approaches, exclusion based approach is the oldest SRI strategy with investment choices aligned to moral codes, as noted by EuroSIF in their 2018 study. The study also notes that over the years, 'exclusion trend' has evolved to include avoidance of "sin stocks", such as companies involved in the production or sale of weapons, alcohol, tobacco and pornography.

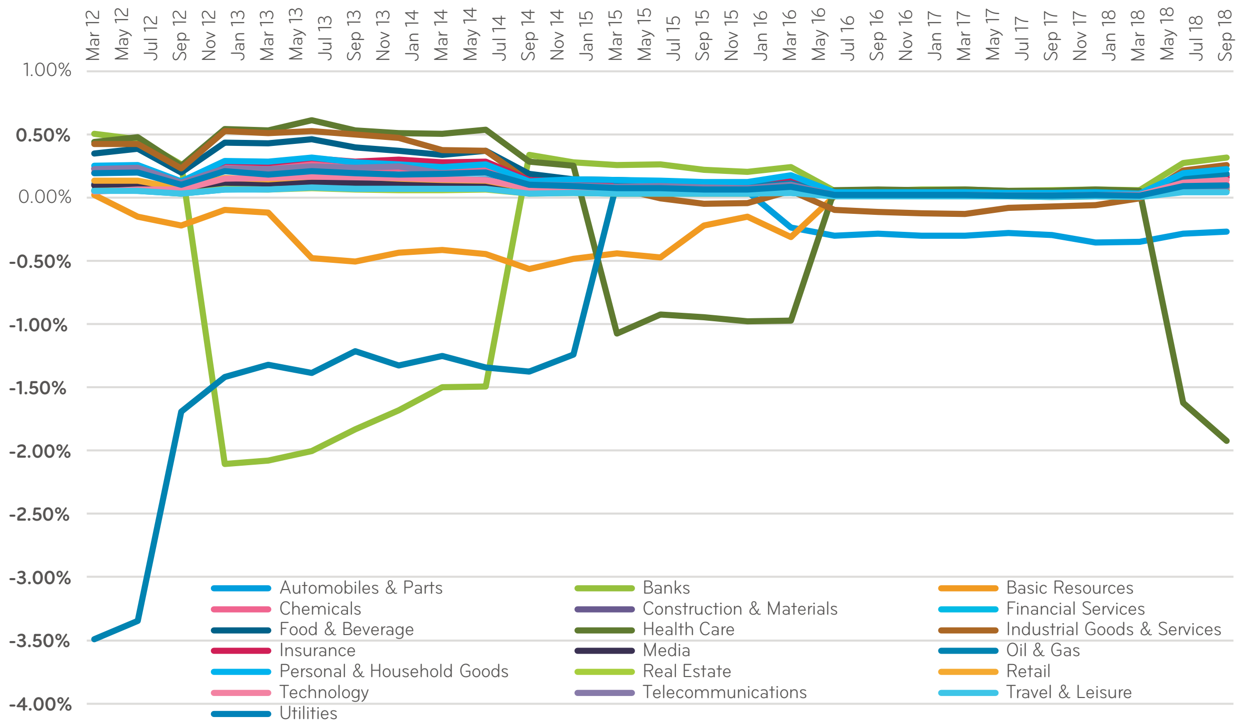
The STOXX Europe 600 ESG-X Index, with its simplistic approach to index construction, includes product involvement screening for controversial weapons, tobacco and thermal coal as well as a norm-based screening that follows the United Nations Global Compact principles of human and labor rights, the environment, business ethics and anti-corruption. The STOXX Europe 600 ESG-X Index delivers a risk-return performance profile that is statistically not significantly different to the STOXX Europe 600 Index, but at the same time achieves compliance with the typical exclusion based SRI approaches. The STOXX Europe 600 ESG-X Index also doesn't appear to have any strong biases or exposures resulting from the exclusions, thus enabling familiarized investors to easily implement and adopt this index as an ESG screened benchmark.

The simplicity of this index also makes it suitable as underlying index for derivatives, structured products and exchange-traded funds, as well as typical asset owners' mandates.

STOXX® EUROPE 600 ESG-X INDEX – ANALYZING ESG EXCLUSIONS

APPENDIX

FIGURE A1: IMPACT OF UNGC BASED EXCLUSION ON ICB SECTOR WEIGHTS



Source: STOXX Ltd.

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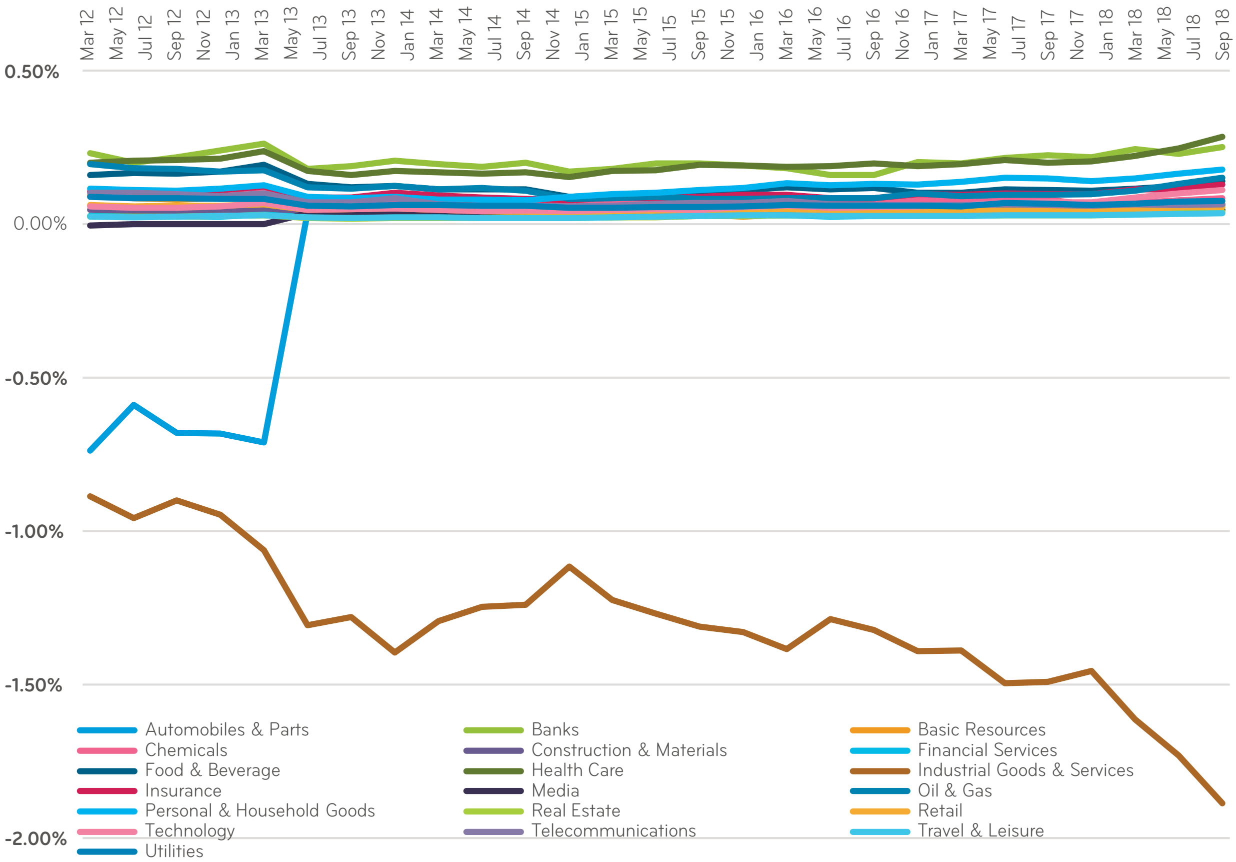
FIGURE A2: IMPACT OF CONTROVERSIAL WEAPONS BASED EXCLUSION ON ICB SECTOR



Source: STOXX Ltd.

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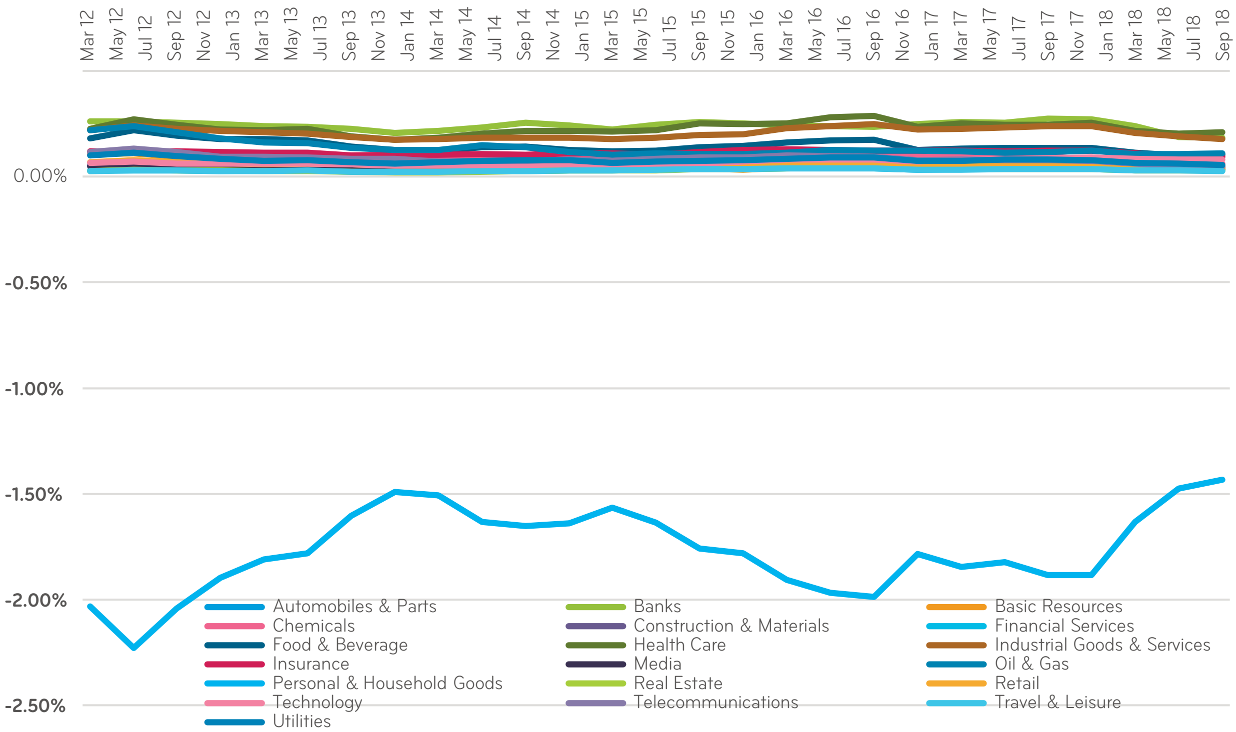
FIGURE A3: IMPACT OF TOBACCO BASED EXCLUSION ON ICB SECTOR WEIGHTS



Source: STOXX Ltd.

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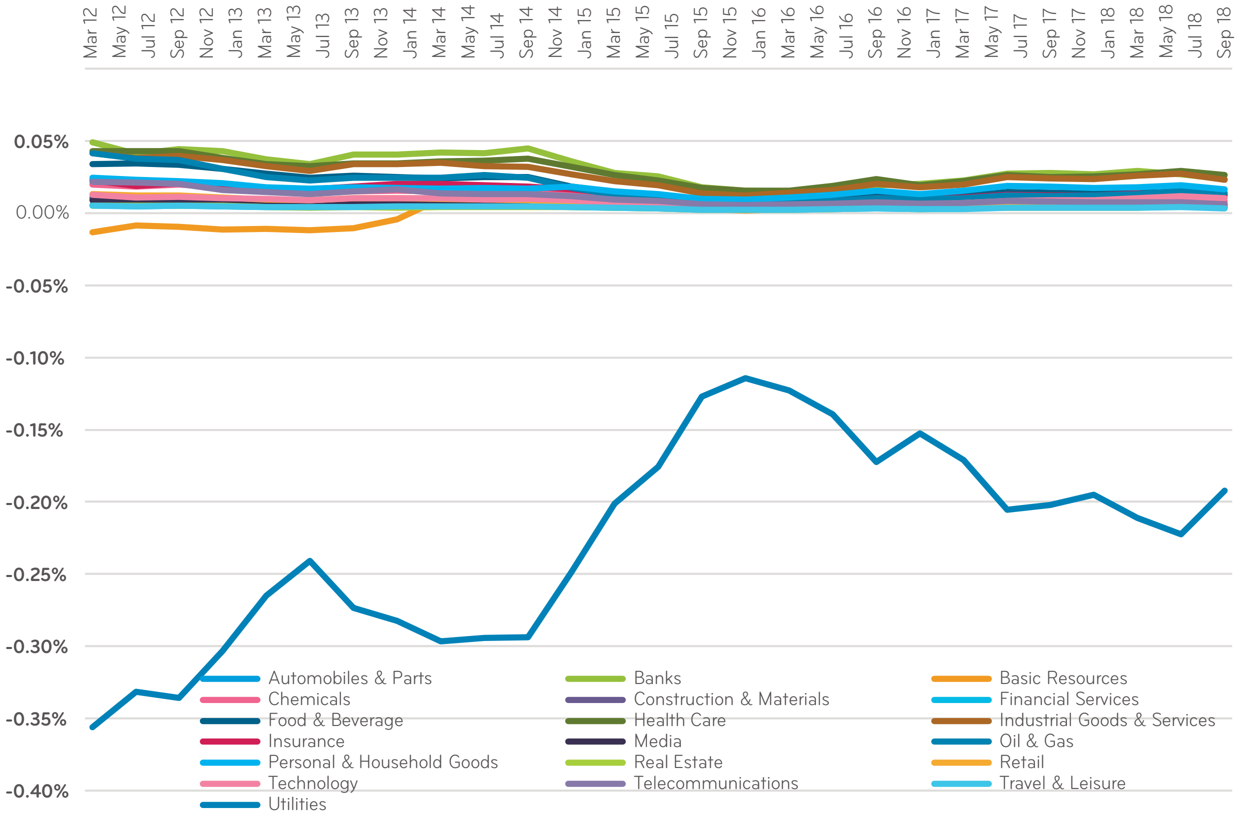
FIGURE A4: IMPACT OF THERMAL COAL BASED EXCLUSION ON ICB SECTOR WEIGHTS



Source: STOXX Ltd.

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About STOXX Ltd.

STOXX Ltd. is a global index provider, currently calculating 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 regions Americas, Europe, Asia/Pacific and 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 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 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. Under the Omnient brand, STOXX offers 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.

STOXX is part of Deutsche Boerse Group, and also calculates, disseminates and markets the DAX indices. www.stoxx.com

Theilerstrasse 1a
CH-6300 Zug
P +41-(0)43 430 71 01
stoxx@stoxx.com
www.stoxx.com

Frankfurt: +49 (0) 69 211 0
Hong Kong: +852 2530 7862
London: +44 (0) 207 862 7680
New York: +1 646-876-2030
Tokyo: +81-3-4578-6688

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