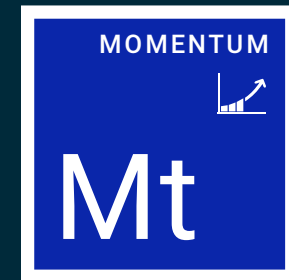
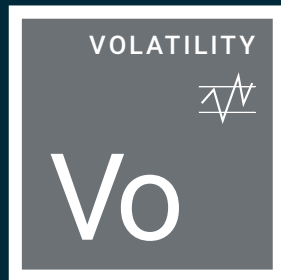


Elements of performance™

Factors by MSCI



Factors are the building blocks of many portfolios – the elements capable of turning data points into actionable insights.



Introduction

With factor investing becoming mainstream and the exponential growth of ESG investing, there has been increased demand from professional investors to incorporate Factor and ESG (environmental, social and governance) principles to manage and attribute risk. In fact, according to our findings in the MSCI Investments Insights 2021¹, nearly 1-in-2 institutional clients state that factors are central to their asset allocation and fully 52% of investors are adopting an ESG framework. While factor investing has long been a part of the investment discussion, the use of factor models and indexes has grown more common among mainstream investors who seek to manage portfolio risk and identify investment opportunities. Factor

investing, also known as Strategic Beta investing, has experienced significant growth – with ETF based assets crossing \$1.22 trillion as at 31 December 2020².

The growth in ESG is similarly strong, with the number of UN Principles for Responsible Investment (PRI) signatories reaching 3,000 as of year 2020³. ESG investors have long focused on exclusions of weapons, alcohol or tobacco producers. Today, we are seeing a more holistic view of ESG being used to manage risk placing ESG principles within factor models in the risk management toolbox.

For many investment managers and product providers, the key challenge of combining factor and ESG into a single portfolio has been to construct an appropriate

methodological framework to balance the desired factor exposure while meeting ESG considerations. MSCI is at the forefront of the integration of ESG into factor portfolios to enable investors to better manage key drivers of risk and return with an extensive set of risk factor models, ESG research and factor and ESG indexes⁴.

The MSCI Momentum ESG Reduced Carbon Target Select Index series uses an exclusion and optimization-based framework. The exclusions include environmental (thermal coal, oil sands), social (tobacco, controversial weapons, nuclear weapons and civilian firearms) and governance (exclusion of 'red flag' controversies represented by those businesses which are involved in very severe business controversies as defined by the MSCI ESG controversies methodology).

1. MSCI Investment Insights 2021: Global Institutional Investor Survey

2. Morningstar Strategic Beta Landscape report April 2021

3. United Nations Principles for Responsible Investing. <http://www.unpri.org/>

4. ESG research, rating and data are produced by MSCI ESG Research LLC. MSCI ESG Indexes and Analytics utilize information from, but are not provided by, MSCI ESG Research LLC. MSCI Indexes and Analytics are products of MSCI Inc. MSCI Indexes are administered by MSCI Limited (UK).



Index methodology⁵

review

The MSCI Momentum ESG Reduced Carbon Target Select Indexes are designed to represent the performance of a strategy targeting exposure to the momentum factor and systematic integration of environmental, social and governance (ESG) norms.

The Indexes are constructed by selecting constituents of a market capitalization weighted index (the 'Parent Index') through an optimization process that aims to maximize the exposure to a momentum factor, minimize tracking error, reduce the carbon-equivalent exposure to CO₂ and other GHG as well as the exposure to potential emissions risk of fossil fuel reserves by thirty percent (30%) and improve the weighted-average industry-adjusted ESG score of the Index by 20% with respect to their respective underlying market capitalization weighted indexes (the 'Parent Index') under certain constraints.

Constructing the Indexes involves the following steps:

- › Defining the Parent Index and the base currency for optimization
- › Defining the exclusion criteria
 - ›› **Environmental exclusions:** oil sands, thermal coal
 - ›› **Social exclusions:** nuclear weapons, controversial weapons, civilian firearms and tobacco
 - ›› **Governance:** red flag controversies
- › Defining the security level carbon exposure
 - ›› Measured in terms of GHG emissions and potential carbon emissions from fossil fuel reserves
- › Defining the optimization setup
 - ›› Calculation of the winsorized Momentum z-score score
 - ›› At each Semi-Annual Index Review (SAIR), the following optimization constraints are employed, which aim to ensure replicability and investability.
 - › The ex-ante tracking error of the Index, relative to the Parent Index will be capped at 5%
 - › The maximum weight of an index constituent will be restricted to the lower of (the weight of the security in the Parent Index + 2%) and 10 times the weight of the security in the Parent Index. The minimum weight of an index constituent will be restricted to be the higher of the (weight of the security in the Parent Index - 2%) and 0.05%
 - › The minimum weight of an index constituent will be 0.05%
 - › The minimum number of index constituents will be 100
 - › For countries with weight greater than 2.5% in the Parent Index, the weight in the MSCI Momentum ESG Reduced Carbon Target Select Indexes will not deviate more than +/-5% from the country weight in the Parent Index
 - › For countries with weight less than 2.5% in the Parent Index, the weight in the MSCI Momentum ESG Reduced Carbon Target Select Indexes will be capped at 3 times their weight in the Parent Index

5. MSCI Momentum ESG Reduced Carbon Target Select Indexes Methodology



Index methodology⁵

review

- › The above country weight constraint will also apply on China A Stock Connect listings as a group separately in addition to the usual country weight constraint on China
- › The sector weights of the MSCI Momentum ESG Reduced Carbon Target Select Indexes will not deviate more than +/-5% from the sector weights of the Parent Index
- › The weighted-average industry-adjusted ESG score of the Index portfolio will be at least 20% more than the weighted-average industry-adjusted ESG score of the Parent Index portfolio at the time of rebalancing
- › The minimum reduction in the Carbon Emission Intensity relative to the Parent Index will be 30%
- › The minimum reduction in the Potential Emissions per dollar of market capitalization relative to the Parent Index will be 30%
- › The one-way turnover of the MSCI Momentum ESG Reduced Carbon Target Select Indexes is constrained to a maximum of 50% at each SAIR

5. MSCI Momentum ESG Reduced Carbon Target Select Indexes Methodology



review

We simulated the index methodology from May 2010 through June 2021 comparing the risk, return and ESG characteristics of the MSCI World Momentum ESG Reduced Carbon Target Select Indexes relative to MSCI World and the standard MSCI World Momentum Index⁶. We found⁷ that the MSCI World Momentum ESG Reduced Carbon Target Select Indexes generated higher returns and lower risk relative to MSCI World and delivered similar risk and return to the standard MSCI World Momentum Index – but with a lower historical tracking error (5.3% versus 5.7%) and improved information ratio (of 0.75 versus 0.63, as shown below in table 1). One question investors may consider when evaluating

the construction of a combined factor and ESG strategy is the impact on the factor exposure and the net change in ESG and climate metrics. In this regard we found similar factor exposure and attribution between the standard MSCI World Momentum Index and the MSCI World Momentum ESG Reduced Carbon Target Select Indexes (shown below)

6. This paper contains analysis of historical data, which may include hypothetical, backtested or simulated performance results. There are frequently material differences between backtested or simulated performance results and actual results subsequently achieved by any investment strategy. The analysis and observations in this paper are limited solely to the period of the relevant historical data, backtest or simulation. Past performance – whether actual, backtested or simulated – is no indication or guarantee of future performance. None of the information or analysis herein is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision or asset allocation and should not be relied on as such.

7. The performance simulations are an example for illustrative purposes only and do not necessarily reflect future performance or index construction



Table 1 - Key metrics

	MSCI World Index	MSCI World Moment ESG Reduced Carbon Target Select Index	MSCI World Momentum Index
Total return* (%)	11.9	15.9	15.5
Total risk (%)	14.1	13.6	13.1
Return / risk	0.84	1.17	1.19
Sharpe ratio	0.8	1.13	1.14
Active return (%)	0	4	3.6
Tracking error (%)	0	5.3	5.7
Information Ratio	nan	0.75	0.63
Historical beta	1	0.89	0.85
Number of constituents***	1631	182	348
Turnover** (%)	1.8	97	91.9
Price to book***	2.1	3.4	3.4
Price to earnings***	18.1	22.7	22.7
Dividend yield*** (%)	2.5	1.7	1.7

Period: May 31, 2010 to Jun 30, 2021

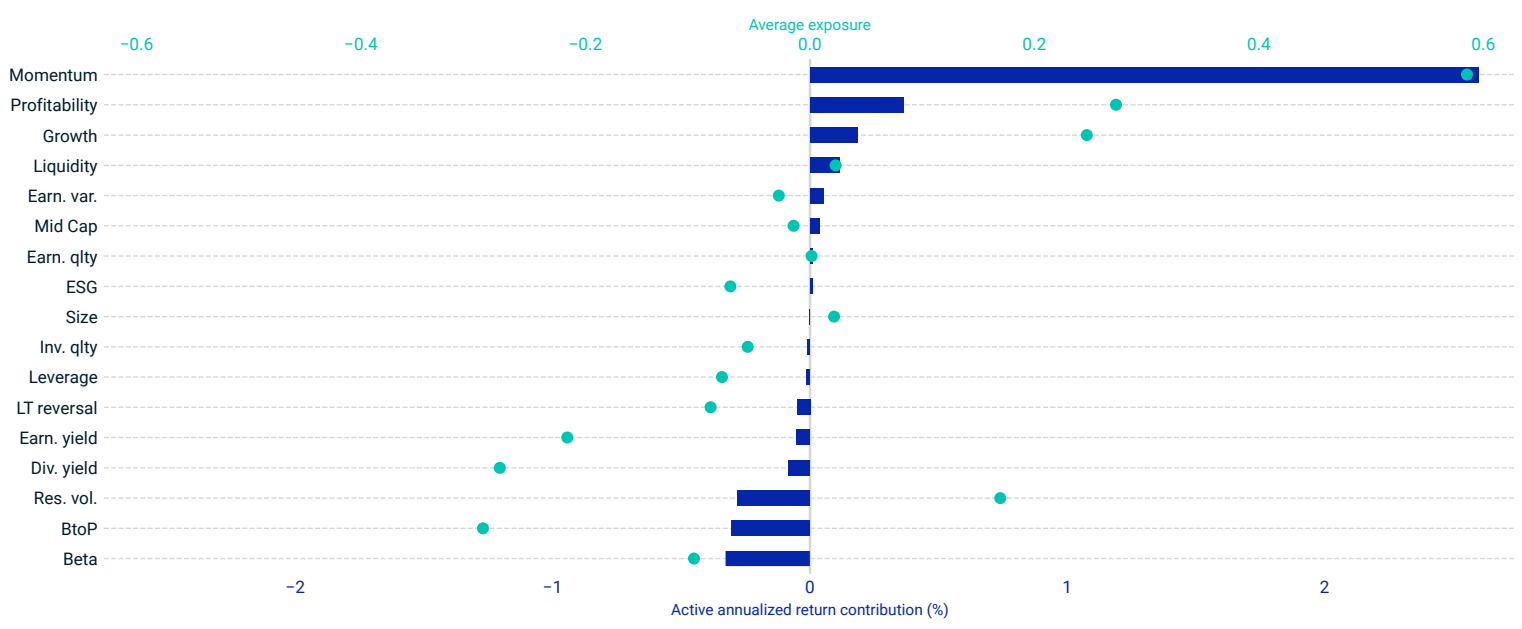
* Net returns annualized in USD

** Annualized one-way index turnover over index reviews

*** Monthly averages



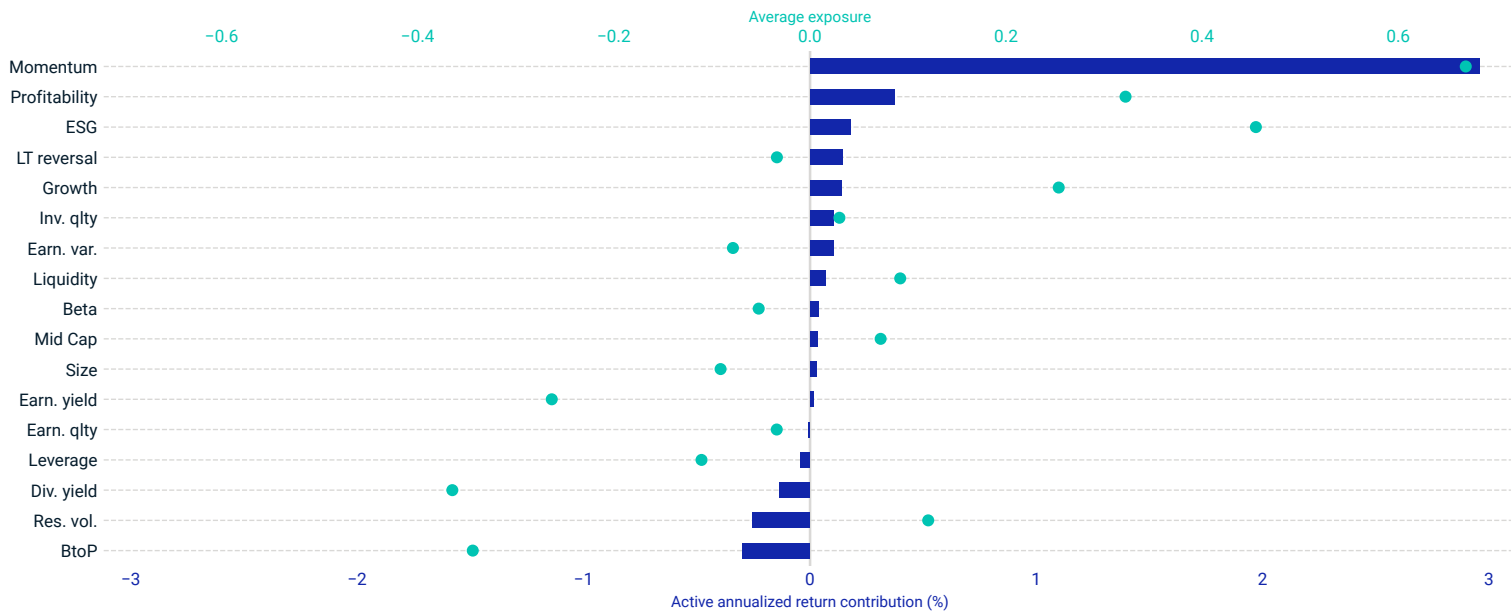
MSCI World Momentum Index



Period: May 31, 2010 to Jun 30, 2021



MSCI World Moment ESG Reduced Carbon Target Select Index



Period: May 31, 2010 to Jun 30, 2021



Table 2 - ESG Metrics > Climate Change

	MSCI World Index	MSCI World Moment ESG Reduced Carbon Target Select Index	MSCI World Momentum Index
Climate footprint			
Carbon emissions (t CO2e/\$M invested)	72	52	74
Carbon intensity (t CO2e/\$M sales)	169	114	171
Wtd avg carbon intensity (t CO2e/\$M sales)	133	54	90
Low carbon transition risks			
Low carbon transition score	6.2	6.4	6.2
Solutions (%)	7	9.1	6.4
Product & operational transition (%)	13.3	8.6	14.4
Asset stranding (%)	0.3	0	0.1
Exposure to asset stranding risks			
Potential carbon emissions (t CO2e/\$M invested)	1299	599	1868
Fossil fuel reserves (%)	4.7	2.6	7.7
Thermal coal mining (%)	0.9	1.6	2.3
Thermal coal-based power generation (%)	2.8	0	2.5
Unconventional oil & gas extraction (%)	2.5	0.5	3.1
Exposure to clean technology solutions			
Clean technologies solutions (> 20% revenue)	8.9	9.8	5.9
Clean technologies solutions revenue (wtd avg %)	4.8	5.5	6.2
Green/brown net revenue exposure	2.9	50.7	4.7
Other climate metrics			
Exposure to carbon-related assets (%)	5.7	0.6	3.6
Climate-related Controversies (%; Score <= 4)	0.8	1.3	1.8
Low Carbon Transition Management Score (% Top Quartile)	70.0	63.3	73.4

As of June 30, 2021



Potential **applications**

Indexes are often used as performance benchmarks for active managers. Investors may also use policy benchmarks in their strategic asset allocation to define eligible markets and the universe of eligible securities for their portfolios. At the same time, they may use them to define active or passive allocations when implementing their asset allocation strategies.

Conclusion

Addressing corporate ESG considerations and the risks of not transitioning to low-carbon portfolio exposure has become increasingly important for many global investors. At the same time, an increasing number of European regulators are requiring institutional investors to consider ESG and carbon risks that may be financially relevant to their investment processes. Simultaneously, Momentum indexes are uniquely designed to reflect the Momentum premium and have been used to provide risk-adjusted performance while maintaining strong investability.

The MSCI Momentum ESG Reduced Carbon Target Select Indexes are designed to help investors get exposure to Momentum strategies combined with ESG principles. These indexes were constructed to preserve the factor exposure and have historically provided higher risk-adjusted returns vs cap-weighted indexes, improved ESG scores and reduced carbon footprints. In addition, these indexes exclude business activities that are commonly seen as controversial, such as tobacco production and weapons manufacturing.



About MSCI Inc.

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process.

To learn more, please visit www.msci.com/esg-investing.

The information contained herein (the "Information") may not be reproduced or disseminated in whole or in part without prior written permission from MSCI. The Information may not be used to verify or correct other data, to create indexes, risk models, or analytics, or in connection with issuing, offering, sponsoring, managing or marketing any securities, portfolios, financial products or other investment vehicles. Historical data and analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. None of the Information or MSCI index or other product or service constitutes an offer to buy or sell, or a promotion or recommendation of, any security, financial instrument or product or trading strategy. Further, none of the Information or any MSCI index is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. The Information is provided "as is" and the user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF MSCI INC. OR ANY OF ITS SUBSIDIARIES OR ITS OR THEIR DIRECT OR INDIRECT SUPPLIERS OR ANY THIRD PARTY INVOLVED IN THE MAKING OR COMPILING OF THE INFORMATION (EACH, AN "MSCI PARTY") MAKES ANY WARRANTIES OR REPRESENTATIONS AND, TO THE MAXIMUM EXTENT PERMITTED BY LAW, EACH MSCI PARTY HEREBY EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WITHOUT LIMITING ANY OF THE FOREGOING AND TO THE MAXIMUM EXTENT PERMITTED BY LAW, IN NO EVENT SHALL ANY OF THE MSCI PARTIES HAVE ANY LIABILITY REGARDING ANY OF THE INFORMATION FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR ANY OTHER DAMAGES EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited.