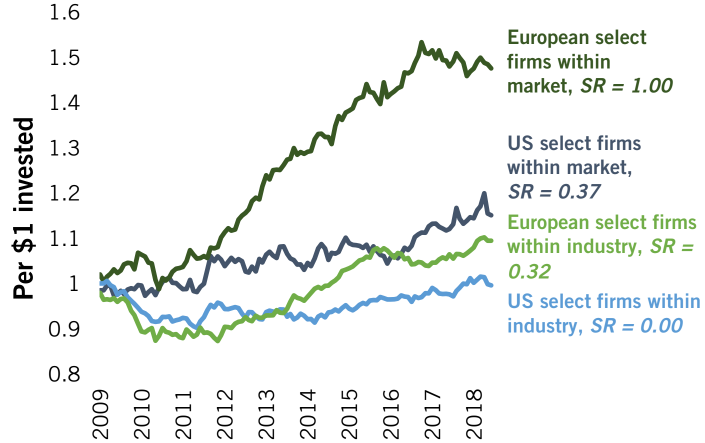
Decarbonization Factors

Going with the flows on low-carbon strategies improves investor returns

Investors increasingly view climate change as an economically significant event, affecting performance now, as well as long-term. While a preponderance of scientific evidence links climate change to carbon emissions, there is a lack of quantitative research on investor behavior and low-carbon strategies. We set out to measure how institutional money, in aggregate, moves around low-carbon strategies and the effects on return profiles. Do flows contain information about the financial performance of low-carbon strategies?

To test this, we design and monitor the performance of six strategies in the US and Europe, which we call "decarbonization factors." These regional strategies take long-short positions on lower carbon intensity firms, industries, and sectors within the respective industry, sector and market.

Decarbonization factors:
Cumulative alpha and Sharpe ratios



Source: State Street Global Markets, MSCI market data, S&P Trucost, Kenneth French data library. Note: The graph presents cumulative abnormal returns for $1 investment in the decarbonization factors from July 1, 2009 to December 31, 2018. The abnormal returns are estimated from regressions based on non-overlapping monthly data, controlling for market, size, value, profitability, investment, momentum factors and NYMEX oil spot returns. Sharpe ratios (1.00, 0.37, 0.32, and 0.00) are based on abnormal returns.

The chart illustrates the historical performance of two sets of regionally distinct decarbonization factors. Across regions we see the most aggressive decarbonization strategies produced the highest cumulative alpha, after controlling for traditional factors. Investors that had significant exposure to the European factors between 2009 and 2018 would have experienced significantly stronger performance relative to the US. Moreover, we observe a low correlation between the regional factor performance and flows. This is exemplified after 2016 when almost all US factors experienced outflows, an effect not seen in Europe. And, consistent with traditional factors, we find strong alignment with the decarbonization factor returns and contemporaneous institutional flows into (or out of) factors. During this period, holding positions in-line with concurrent monthly institutional flows into factors generated alpha ranging from 1.5% to 8.5%, well beyond the factor performance alone. While such perfect alignment is not practically possible, we find aggregate flows to be highly persistent, suggesting that flows contain information about anticipated climate change fundamentals and, may offer a useful signal to future price trends.

What can investors do with this insight? Decarbonization factors are versatile for investors to use. The low correlation between regional decarbonization factor returns creates an attractive opportunity for investors to rotate across strategies – implementing tilts at the sector, industry or firm level across regions – providing continuous exposure to low-carbon portfolios with more attractive return profiles.

*For more on this topic, see our 2021 journal article: "**Decarbonization Factors**" by Alexander Cheema-Fox, Bridget Realmuto LaPerla, George Serafeim, David Turkington and Stacie Wang, The Journal of Impact and ESG Investing, Vol. 2, Issue 1, August 2021*

STATE STREET.

State Street Associates

Our goal is to bridge the worlds of financial theory and practice with innovative investment research for asset managers and owners. We focus on two fundamental drivers of performance to help State Street's clients exceed their performance goals and manage risk:

INFORMATION ADVANTAGE: Our extensive indicator suites provide investors with powerful and practical market intelligence.

RESEARCH ADVANTAGE: We partner with renowned academics to develop impactful new ideas for portfolio construction, risk management, and investment strategies.

Learn more about our thought leadership, publications, interactive tools and indicators at Insights in this marketing material is not provided for the purpose of soliciting investments from investors residing in Brazil and no information in this marketing material should be construed as a public offering or unauthorized distribution of the products within Brazil, pursuant to applicable Brazilian law and regulations. The products and services outlined in this document are generally offered in Canada by State Street Bank and Trust Company. This communication is made available in Hong Kong by State Street Bank and Trust Company which accepts responsibility for its contents, and is intended for distribution to professional investors only (as defined in the Securities and Futures Ordinance). Information provided is of a general nature only and has not been reviewed by any regulatory authority in Hong Kong. This communication is made available in Australia by State Street Bank and Trust Company ABN 70 062 819 630, AFSL 239679 and is intended only for wholesale clients, as defined in the Corporations Act 2001. This communication is made available in Singapore by State Street Bank and Trust Company, Singapore Branch ("SSBTS"), which holds a wholesale bank license by the Monetary Authority of Singapore. In Singapore, this communication is only distributed to accredited, institutional investors as defined in the Singapore Financial Advisers Act ("FAA"). Note that SSBTS is exempt from Sections 27 and 36 of the FAA. When this communication is distributed to overseas investors as defined in the FAA, note that SSBTS is exempt from Sections 26, 27, 29 and 36 of the FAA. This advertisement has not been reviewed by the Monetary Authority of Singapore. The products and services outlined in this document are made available in South Africa through State Street Bank and Trust Company, which is authorized in South Africa under the Financial Advisory and Intermediary Services Act, 2002 as a Category I Financial Services Provider; FSP No. 42671. This communication is made available in Israel by State Street Bank and Trust Company, which is not licensed under Israel's Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 1995. This communication may only be distributed to or used by investors in Israel which are "eligible clients" as listed in the First Schedule to Israel's Regulation of Investment Advice, Investment Marketing and Portfolio Management Law 1995. This communication is made available in Qatar by State Street Bank and Trust Company and its affiliates. The information in this communication has not been reviewed or approved by the Qatar Central Bank, the Qatar Financial Markets Authority or the Qatar Financial Centre Regulatory Authority, or any other relevant Qatari regulatory body. This communication is made available in Malaysia by State Street Bank and Trust Company, which is authorized and regulated by the Federal Reserve Board. State Street Bank and Trust Company is not licensed within or doing business within Malaysia and the activities that are being discussed are carried out off-shore. The written materials do not constitute, and should not be construed as constituting: 1) an offer or invitation to subscribe for or purchase securities or futures in Malaysia or the making available of securities or futures for purchase or subscription in Malaysia; 2) the provision of investment advice concerning securities or futures; or 3) an undertaking by State Street Bank and Trust Company to manage the portfolio of securities or futures contracts on behalf of other persons. This communication is made available in Turkey by State Street Bank and Trust Company and its affiliates. The information included herein is not investment advice. Investment advisory services are provided by portfolio management companies, brokers and banks without deposit collection licenses within the scope of the investment advisory agreements to be executed with clients. Any opinions and statements included herein are based on the personal opinions of the commentators and authors. These opinions may not be suitable to your financial status and your risk and return preferences. Therefore, an investment decision based solely on the information herein may not be appropriate to your expectations. This communication is made available in United Arab Emirates by State Street Bank and Trust Company and its affiliates. This communication does not, and is not intended to, constitute an offer of securities anywhere in the United Arab Emirates and accordingly should not be construed as such. Nor does the addressing of this communication to you constitute, or is intended to constitute, the carrying on or engagement in banking, financial and/or investment consultation business in the United Arab Emirates under the rules and regulations made by the Central Bank of the United Arab Emirates, the Emirates Securities and Commodities Authority or the United Arab Emirates Ministry of Economy. Any public offer of securities in the United Arab Emirates, if made, will be made pursuant to one or more separate documents and only in accordance with the applicable laws and regulations. Nothing contained in this communication is intended to endorse or recommend a particular course of action or to constitute investment, legal, tax, accounting or other professional advice. Prospective investors should consult with an appropriate professional for specific advice rendered on the basis of their situation. Further, the information contained within this communication is not intended to lead to the conclusion of any contract of whatsoever nature within the territory of the United Arab Emirates. This communication has been forwarded to you solely for your information, and may not be reproduced or passed on, directly or indirectly, to any other person or published, in whole or in part, for any purpose. This communication is addressed only to persons who are professional, institutional or otherwise sophisticated investors. This communication is made available in Saudi Arabia by State Street Bank and Trust Company and its affiliates. The information contained in this communication is not intended to invite or induce any person to engage in securities activities nor does it constitute an offer to sell securities or the solicitation of an offer to buy, or recommendation for investment in, any securities within the Kingdom of Saudi Arabia or any other jurisdiction. The information in this communication is not intended as financial advice. Moreover, this communication is not intended as a prospectus within the meaning of the applicable laws and regulations of the Kingdom of Saudi Arabia or any other jurisdiction and this communication is not directed to any person in any country in which the distribution of such communication is unlawful. This communication provides general information only. The information and opinions in this communication are stated as at the date indicated. The information may therefore not be accurate or current. The information and opinions contained in this communication have been compiled or arrived at from sources believed to be reliable in good faith, but no representation or warranty, express or implied, is made by State Street Bank and Trust Company and its affiliates as to their accuracy, completeness or correctness. This communication is made available in South Korea by State Street Bank and Trust Company and its affiliates, which accept responsibility for its contents, and is intended for distribution to professional investors only. State Street Bank and Trust Company is not licensed to undertake securities business within South Korea, and any activities related to the content hereof will be carried out off-shore and only in relation to off-shore non-South Korea securities. This communication is made available in Indonesia by State Street Bank and Trust Company and its affiliates. Neither this communication nor any copy hereof may be distributed in Indonesia or to any Indonesian citizens wherever they are domiciled or to Indonesian residents except in compliance with applicable Indonesian capital market laws and regulations. This communication is not an offer of securities in Indonesia. Any securities referred to in this communication have not been registered with the Capital Market and Financial Institutions Supervisory Agency (BAPEPAM-LK) pursuant to relevant capital market laws and regulations, and may not be offered or sold within the territory of the Republic of Indonesia or to Indonesian citizens through a public offering or in circumstances which constitute an offer within the meaning of the Indonesian capital market law and regulations. This communication is made available in Oman by State Street Bank and Trust Company and its affiliates. The information contained in this communication is for information purposes and does not constitute an offer for the sale of foreign securities in Oman or an invitation to an offer for the sale of foreign securities. State Street Bank and Trust Company is neither a bank nor financial services provider registered to undertake business in Oman and is neither regulated by the Central Bank of Oman nor the Capital Market Authority. Nothing contained in this communication report is intended to constitute Omani investment, legal, tax, accounting, investment or other professional advice. This communication is made available in Taiwan by State Street Bank and Trust Company and its affiliates, which accept responsibility for its contents, and is intended for distribution to professional investors only. State Street Bank and Trust Company is not licensed to undertake securities business within Taiwan, and any activities related to the content hereof will be carried out off-shore and only in relation to off-shore non-Taiwan securities. Peoples Republic of China ("PRC"). This communication is being distributed by State Street Bank and Trust Company. State Street Bank and Trust Company is not licensed or carrying on business in the PRC in respect of any activities described herein and any such activities it does carry out are conducted outside of the PRC. These written materials do not constitute, and should not be construed as constituting: 1) an offer or invitation to subscribe for or purchase securities or futures in PRC or the making available of securities or futures for purchase or subscription in PRC; 2) the provision of investment advice concerning securities or futures; or 3) an undertaking by State Street Bank and Trust Company to manage the portfolio of securities or futures contracts on behalf of other persons.

Products and services may not be available in all jurisdictions. Please contact your State Street representative for further information. SSA MMD 2022-01

To learn how State Street looks after your personal data, visit: https://www.statestreet.com/utility/privacy-notice.html.