

RESEARCH

What a Company's Emissions Tell Us about Its Expected Returns

Wei Dai, PhD
Senior Researcher and Vice President

Philipp Meyer-Brauns, PhD
Senior Researcher and Vice President

Oct 21, 2020

Climate scientists have identified greenhouse gas (GHG) emissions as the largest contributor to global climate change.¹ As a result, many investors are looking to reduce their emissions exposure through their portfolios and wondering if doing so would affect their investment experience. [A new research paper](#) from Dimensional delves into this subject by examining the relation between firm-level emissions and expected returns.

Before venturing into the empirical analysis, it is helpful to consider the theoretical channels through which a company's emissions characteristics may impact its expected stock or bond returns. Valuation theory tells us that current market prices reflect aggregate investor expectations about future cash flows and the discount rates they apply to those cash flows. The discount rates are investors' expected rates of return.

It is reasonable to expect that a firm's environmental profile could impact its future cash flows and the discount rate, due to risks, opportunities, and preferences associated with sustainability considerations. For example, if aggregate investor preferences shift in favor of companies with lower emissions, this can increase the prices and decrease the expected returns of stocks and bonds issued by these companies.

Our study of the relation between emissions and expected returns covers US, developed ex US, and emerging markets stocks as well as US corporate bonds from 2009 to 2018. We examine firm-level emissions profiles through three metrics: emission intensity, emission level, and change in emission level.

We do not find evidence of a reliable link between a firm's emissions profile and future stock returns. Over the sample period, there are mixed results about the relation between stock performance and emission intensity, emission level, and change in emission level. Turning to fixed income, the data similarly do not show a reliable relation between emissions profiles and expected corporate bond returns.

The paper also examines the potential impact of emissions variables on future profitability. Research has shown that profitability is persistent and that current profitability is a reliable proxy for future profitability. Our results suggest that, after

controlling for current profitability, emission intensity, emission level, and change in emission level lose their explanatory power for future profitability (if any). In other words, there is no incremental informational content in these emission metrics about future profitability above and beyond what is contained in current profitability.

The lack of a strong relation between firm-level emission metrics and security returns implies that the impact of sustainability-related changes to aggregate investor demand may have been small over the time period we study. Data limitations also make it challenging to detect any potential relation empirically: the sample period is relatively short, security returns are volatile, and emissions reporting is voluntary and not standardized. On the other hand, to the extent that current or future shifts in investors' tastes and preferences impact security prices and expected returns, we expect an investment approach built on the valuation framework to capture such impacts and be able to identify differences in expected returns through market prices and proxies for expected future cash flows.

[VIEW THE RESEARCH ON SSRN ↗](#)

LEARN MORE

[Connecting the Dots: From Climate Change to Economics and Investing
How Much Impact Does the President Have on Stocks?
To Hedge or Not to Hedge](#)

-
1. See, for instance, the Intergovernmental Panel on Climate Change's *Climate Change 2014: Synthesis Report*.

GLOSSARY

Discount rate: Also known as the "required rate of return," this is the expected return investors demand for holding a stock.

Future cash flows: The income a company produces for investors in the future.

Emission level: Measured as the sum of direct (Scope 1) and indirect (Scope 2) GHG emissions in metric tons of carbon dioxide equivalents. For definitions of different emissions scopes, see <https://www.epa.gov/greeningepa/greenhouse-gases-epa>**Emission intensity:** Emission level divided by sales in USD million.

The information in this document is provided in good faith without any warranty and is intended for the recipient's background information only. It does not constitute investment advice, recommendation, or an offer of any services or products for sale and is not intended to provide a sufficient basis on which to make an investment decision. It is the responsibility of any persons wishing to make a purchase to inform themselves of and observe all applicable laws and regulations. Unauthorized copying, reproducing, duplicating, or transmitting of this document are strictly prohibited. Dimensional accepts no responsibility for loss arising from the use of the information contained herein.

"Dimensional" refers to the Dimensional separate but affiliated entities generally, rather than to one particular entity. These entities are Dimensional Fund Advisors LP, Dimensional Fund Advisors Ltd., Dimensional Ireland Limited, DFA Australia Limited, Dimensional Fund Advisors Canada ULC, Dimensional Fund Advisors Pte. Ltd, Dimensional Japan Ltd., and Dimensional Hong Kong Limited. Dimensional Hong Kong Limited is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services.

UNITED STATES: Dimensional Fund Advisors LP is an investment advisor registered with the Securities and Exchange Commission.

CANADA: These materials have been prepared by Dimensional Fund Advisors Canada ULC. Commissions, trailing commissions, management fees, and expenses all may be associated with mutual fund investments. Unless otherwise noted, any indicated total rates of return reflect the historical annual compounded total returns, including changes in share or unit value and reinvestment of all dividends or other distributions, and do not take into account sales, redemption, distribution, or optional charges or income taxes payable by any security holder that would have reduced returns. Please read the prospectus before investing. Mutual funds are not guaranteed, their values change frequently, and past performance may not be repeated.

AUSTRALIA and NEW ZEALAND: This material is issued by DFA Australia Limited (AFS License No. 238093, ABN 46 065 937 671). This material is provided for information only. No account has been taken of the objectives, financial situation or needs of any particular person. Accordingly, to the extent this material constitutes general financial product advice, investors should, before acting on the advice, consider the appropriateness of the advice, having regard to the investor's objectives, financial situation and needs. Any opinions expressed in this material reflect our judgement at the date of publication and are subject to change.

WHERE ISSUED BY DIMENSIONAL IRELAND LIMITED OR DIMENSIONAL FUND ADVISORS LTD.

Neither Dimensional Ireland Limited (DIL) nor Dimensional Fund Advisors Ltd. (DFAL), as applicable (each an "Issuing Entity," as the context requires), give financial advice. You are responsible for deciding whether an investment is suitable for your personal circumstances, and we recommend that a financial adviser helps you with that decision.

WHERE ISSUED BY DIMENSIONAL IRELAND LIMITED

Issued by Dimensional Ireland Limited (DIL), with registered office 10 Earlsfort Terrace, Dublin 2, D02 T380, Ireland. DIL is regulated by the Central Bank of Ireland (Registration No. C185067). Information and opinions presented in this material have been obtained or derived from sources believed by DIL to be reliable, and DIL has reasonable grounds to believe that all factual information herein is true as at the date of this document.

DIL issues information and materials in English and may also issue information and materials in certain other languages. The recipient's continued acceptance of information and materials from DIL will constitute the recipient's consent to be provided with such information and materials, where relevant, in more than one language.

WHERE ISSUED BY DIMENSIONAL FUND ADVISORS LTD.

Issued by Dimensional Fund Advisors Ltd. (DFAL), 20 Triton Street, Regent's Place, London, NW1 3BF. DFAL is authorised and regulated by the Financial Conduct Authority (FCA). Information and opinions presented in this material have been obtained or derived from sources believed by DFAL to be reliable, and DFAL has reasonable grounds to believe that all factual information herein is true as at the date of this document.

DFAL issues information and materials in English and may also issue information and materials in certain other languages. The recipient's continued acceptance of information and materials from DFAL will constitute the recipient's consent to be provided with such information and materials, where relevant, in more than one language.

RISKS

Investments involve risks. The investment return and principal value of an investment may fluctuate so that an investor's shares, when redeemed, may be worth more or less than their original value. Past performance is not a guarantee of future results. There is no guarantee strategies will be successful.

Environmental and social screens may limit investment opportunities for the strategy.

JAPAN

Provided for institutional investors only. This document is deemed to be issued by Dimensional Japan Ltd., which is regulated by the Financial Services Agency of Japan and is registered as a Financial Instruments Firm conducting Investment Management Business and Investment Advisory and Agency Business. This material is solely for informational purposes only and shall not constitute an offer to sell or the solicitation to buy securities or enter into investment advisory contracts. The material in this article and any content contained herein may not be reproduced, copied, modified, transferred, disclosed, or used in any way not expressly permitted by Dimensional Japan Ltd. in writing. All expressions of opinion are subject to change without notice.

Dimensional Japan Ltd.

Director of Kanto Local Finance Bureau (FIBO) No. 2683

Membership: Japan Investment Advisers Association

FOR PROFESSIONAL INVESTORS IN HONG KONG.

This material is deemed to be issued by Dimensional Hong Kong Limited (CE No. BJE760) ("Dimensional Hong Kong"), which is licensed by the Securities and Futures Commission to conduct Type 1 (dealing in securities) regulated activities only and does not provide asset management services.

This material should only be provided to "professional investors" (as defined in the Securities and Futures Ordinance [Chapter 571 of the Laws of Hong Kong] and its subsidiary legislation) and is not for use with the public. This material is not directed to any person in any jurisdiction where (by reason of that person's nationality, residence, or otherwise) the publication or availability of this material are prohibited or which would subject Dimensional Hong Kong (including its affiliates) or any of Dimensional Hong Kong's products or services to any registration, licensing, or other such legal requirements within such jurisdiction or country. When provided to prospective investors, this material forms part of, and must be provided together with, applicable fund offering materials. This material must not be provided to prospective investors on a standalone basis. Before acting on any information in this material, you should consider whether it is suitable for your particular circumstances and, if appropriate, seek professional advice.

Unauthorized copying, reproducing, duplicating, or transmitting of this material are prohibited. This material and the distribution of this material are not intended to constitute and do not constitute an offer or an invitation to offer to the Hong Kong public to acquire, dispose of, subscribe for, or underwrite any securities, structured products, or related financial products or instruments nor investment advice thereto. Any opinions and views expressed herein are subject to change. Neither Dimensional Hong Kong nor its affiliates shall be responsible or held responsible for any content prepared by financial advisors. Financial advisors in Hong Kong shall not actively market the services of Dimensional Hong Kong or its affiliates to the Hong Kong public.

SINGAPORE

This material is deemed to be issued by Dimensional Fund Advisors Pte. Ltd., which is regulated by the Monetary Authority of Singapore and holds a capital markets services license for fund management.

This advertisement has not been reviewed by the Monetary Authority of Singapore. This information should not be considered investment advice or an offer of any security for sale. All information is given in good faith without any warranty and is not intended to provide professional, investment, or any other type of advice or recommendation and does not take into account the particular investment objectives, financial situation, or needs of individual recipients. Before acting on any information in this material, you should consider whether it is suitable for your particular circumstances and, if appropriate, seek professional advice. Dimensional Fund Advisors Pte. Ltd. does not accept any responsibility and cannot be held liable for any person's use of or reliance on the information and opinions contained herein. Neither Dimensional Fund Advisors Pte. Ltd. nor its affiliates shall be responsible or held responsible for any content prepared by financial advisors.

dimensional.com



[https://www.mydimensional.com/what-a-compa...
_cldee=c3VzYW5AYXNpd2VhbHRob...
cb473d34a87ae61180ddc4346bac0934-160e13c2a8f9496caacd941af8f3bd16&utm_source=ClickDimensions&utm_m...
%20Weekly%20Digest](https://www.mydimensional.com/what-a-compa..._cldee=c3VzYW5AYXNpd2VhbHRob...cb473d34a87ae61180ddc4346bac0934-160e13c2a8f9496caacd941af8f3bd16&utm_source=ClickDimensions&utm_m...%20Weekly%20Digest)