

## 2022 MOSKOWITZ PRIZE RESEARCH BRIEF

### Dissecting Green Returns

By Lubos Pastor, Robert Stambaugh, and Lucian Taylor

#### Should investors expect outperformance from sustainable investments in the future? Probably not.

#### ABOUT THE PRIZE

The Moskowitz Prize recognizes research that exhibits empirical excellence and the potential to inform responsible business and investing practices in the real world.

#### SUMMARY OF FINDINGS

Should we expect green investments to deliver superior returns?

Many investors and asset managers answer “yes,” but, in [previous research](#), Lubos Pastor, Robert Stambaugh, and Lucian Taylor asserted the opposite. They suggested investors derive satisfaction from owning green investments, and that green investments may offer a hedge against climate risk, both of which drive prices higher and the expected rate of return lower, while an efficient market already prices superior expected profits.

Yet, in the study period for *Dissecting Green Returns*, green assets outperformed their non-green counterparts in both the bond and stock markets.

What explains this superior performance, and what does it say about past and future investor expectations?

#### The Bond “Greenium”

If you are looking for a good record of the returns expected by investors, bonds are a useful test case because expected returns are easily observable in yield to maturity.

The authors examine green bonds and non-green bonds issued by the German government with nearly identical characteristics (maturity, coupons, currency). Because the financial characteristics are the same, the yield spread, or “greenium,” between the green and non-green twin-bonds reflects investors’ willingness to accept a lower return in exchange for holding assets more aligned with environmental values.

Notably the authors find that, as theory predicted, expected returns for the green-twins were lower, but, surprisingly, realized returns were higher. This

unexpected wedge between expected and realized returns was driven by an expanding greenium—investors preference for green assets increased during the life of the bond.

This reference case in hand, the authors turn to the larger universe of U.S. stocks.

#### Defining Green and Brown Stocks

The authors use MSCI’s ESG ratings to label one third of U.S. Stocks as green and one third as brown. They generate a rating that combines a company’s resilience to long-term environmental risks with how important environmental concerns are for the typical firm in the company’s industry. The authors analyze a portfolio of “green minus brown” stocks (GMB) for the period of November 2012 to December 2020.

#### Realized Returns vs. the Equity “Greenium”

Just as they did with bonds, the authors look to estimate the wedge between expected returns and realized returns for the GMB portfolio.

The authors calculate the difference in realized return between green and brown stocks and find that green stocks outperformed by a cumulative return difference of 174% over the sample period.

Were those superior returns a surprise?

To answer that question, the authors estimate the expected returns of green and brown stocks ex ante, by extracting implied costs of capital from analysts’ earnings forecasts. They, in fact, do find lower expected returns for green stocks.

So, if superior returns weren’t expected, what changed?

## Reconciling Expected and Realized Returns with Climate Concern Shocks

In two scenarios – German Bonds and US Stocks – the authors observe that superior returns weren't expected by investors at the outset of investment but were realized.

To explain this wedge between expected and realized returns, the paper looks to a dataset on climate concern shocks. The Media Climate Change Concerns index, constructed by Ardia, Bluteau, Boudt, and Inghelbrecht, aggregates data from eight major U.S. newspapers and captures the number of climate news stories each day as well as their negativity and focus on risk.

Matching this data to the GMB equity portfolio, the authors compute an ex post estimate of green-minus-brown expected return by purging unanticipated shocks from realized return.

When climate shocks are set to zero, the superior performance of green vs. brown effectively disappears. These shocks seem to fully account for the superior performance of green stocks during the sample period.

### Implications for “Growth” vs. “Value”

The findings also help explain why growth stocks strongly outperformed value stocks in the last decade, reversing a century-long trend. The authors show that a large part of value's underperformance can be explained by (unexpected) outperformance of green stocks, as value stocks tend to be less green than growth stocks. Once green returns are accounted for, the recent gap between growth and value stock performance largely disappears.

### KEY DATA

- Media Climate Change Concerns index (MCCC) Ardia, Bluteau, Boudt, and Inghelbrecht (2021)
- MSCI ESG Ratings from November 2012 to December 2020
- Bloomberg end-of-day bond prices and mid-yields to maturity for the 10-year green bond (ISIN DE0001030708) and the 10-year non-green bond (DE0001102507)

## PRACTICAL IMPLICATIONS

### For Investors

- “Past performance doesn't equal future returns” is a common refrain for investors, but the findings of *Dissecting Green Returns* suggest the adage might be even more applicable for green stocks. If recent outperformance resulted from increased demand by ESG investors, then green assets' expected returns should be even lower today than they were a decade ago.
- When considering the relative performance of value vs. growth, investors should remember that growth stocks tend to be green stocks, so the outperformance of growth stocks during the last decade is consistent with the (unexpected) outperformance of green stocks.
- Not accounting for the unexpected nature of past returns on stocks that appear to be good climate hedges, could lead investors to mistakenly infer that those stocks providing better climate hedging have higher expected returns, not lower, as theory predicts.

### For Corporate Managers

- For corporate managers, the paper implies that greener firms have lower costs of capital than their recent stock performance might suggest. Conversely, firms that ignore or resist environmental issues may face relatively higher costs of capital and lower valuations.

### QUESTIONS FOR FUTURE RESEARCH

#### On Climate Concern Shocks:

What is the salient factor in climate news shocks? Are investors more sensitive to certain types of climate shocks?

#### On Sources of Increased Demand:

How can we better disentangle investors demanding green stocks from the expectation of customers demanding greener products?