

# The Real Economics of ESG

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# Introduction

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- “ESG” investing has become vastly more popular in recent years with aggregate AUM of **explicit** ESG funds approaching \$1 Trillion, the evidence on the financial benefit of such practices to equity investors is mixed.
  - Although numerous academic studies have been conducted, there is not a clear answer as to whether investment strategies built around ESG themes or the related concepts of SRI and “sustainability” actually produce different investment outcomes.
- Many studies have reported differential return outcomes (both positive and negative) but have been unable to positively associate the differences with ESG/SRI effects when we control for traditional equity attributes.
  - diBartolomeo and Kurtz (JOI, 1996 and JOI 2011)
  - If we observe only recent data we may attribute excess returns to ESG as a sort of self-fulfilling prophecy (i.e. a momentum effect).
- Today’s presentation will resolve the ambiguity using data from the corporate bond market and the theory of Merton (1974) on how stocks and bonds are linked.

# The Missing Element is Time Horizon

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- Equity holders *might benefit over short time horizons* from a company reducing expenses related to environmental safeguards or good treatment of their labor force even if such “corner cutting” increases the likelihood of a “large” negative event in the long run (e.g. an oil spill or labor strike).
  - Bondholders have very limited upside from improved short-term profits but care a lot about risks of major negative events before debt maturity.
- While there is a lot talk about “sustainability” in investing, there isn’t actually much formal research because the time horizons have to be long by definition.
  - We did one study of equity returns that was intentionally survivorship biased, as if we knew in advance which US firms would survive for another twenty-five years into the future.
  - Excess returns of around 3% annually were observed for the survivor portfolio, which is consistent with two other studies of “sustainable” portfolios.

[Northfield News December 2018.pub \(northinfo.com\)](#).

# Milton Friedman in the *New York Times* 1970

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- Friedman does not say anything about time. Does he mean short term quarterly profits or long-term profitability of an enterprise?
- Essentially every capital budgeting decision a company makes involves short term expenditure to promote future profits, so there may be no conflict between ESG investors and Friedman's view.

# Joe Bragdon and the Genie of the LAMP

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- The idea that there would be **long-term consequences** for companies relating to their environmental and social policies **is not new**.
- Bragdon and Marlin published “Is Pollution Profitable?” in *Risk Management* in 1972.
- In 1995, Bragdon went on to create his own equity index called LAMP consisting of firms he considered “sustainable”.
- Northfield has been contracted twice to analyze the performance of the LAMP index, so we can confirm at least the majority of the published performance record, which is quite favorable.

# The Other Milton in SRI/ESG

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- In 1984, Milton Moskowitz and Robert Levering published the best-selling book The 100 Best Companies to Work for in America.
- The book's detailed discussion of the social ("S" in ESG) role and responsibilities of corporate sector is the basis of much of the current discussion of the "socially responsible" investing.
- Northwestern University now administers the Moskowitz Prize which has given an annual prize since 1995 recognizing SRI/ESG research.
  - About 1000 papers have been submitted providing a very rich source of research material.
  - I'm the only person to have been one of the judges every year since 1995.

# ESG and the Rise of “Greenwashing”

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- Northfield recently sponsored a team of MIT graduate students in a study of potential “Greenwashing” by asset managers.
  - There has been a lot of public debate whether asset managers see ESG as a serious issue, or just a marketing ploy.
  - [ESGs, sustainable investing are not as green as touted, investor says \(usatoday.com\)](#) was an Op-Ed in USA Today about Blackrock.
- The students analyzed ESG score data on equity holdings of sixteen asset managers as of six months before and six months after the manager became a signatory to the United Nations Principles on Responsible Investment.
- We can’t distribute the student findings as a matter of MIT policy, **but my interpretation** of the results is that the asset managers mostly moved positions in high ESG score stocks out of the designated “ESG funds” into their other equity funds to give the *appearance of consistency with the UNPRI* but did not increase overall holdings of high ESG score stocks.
  - *Reminds me of watered-down liquor in a college bar.*

# The Macroeconomic Problem of ESG

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- E, S and G strategies all have different levels of “free riding” as everyone in the world might benefit from cleaner air and a slowing of climate change, while the benefit of better governance of a given company accrues to a far narrower set of stakeholders.
- Many very large investors (e.g. sovereign funds) take free riding seriously.
  - In a 2015 Northfield essay, I proposed that very large investors (e.g. sovereign wealth funds) proactively provide economic and humanitarian aid to geopolitically unstable countries
  - By reducing the incidence of revolutions, wars, and famines financial market volatility would be reduced sufficiently so that providing aid was actually profitable to investors.
  - The feedback I got was that while everyone thought it was a worthy idea, they could not justify allowing “free riders” (countries that did not contribute) to benefit from peace.

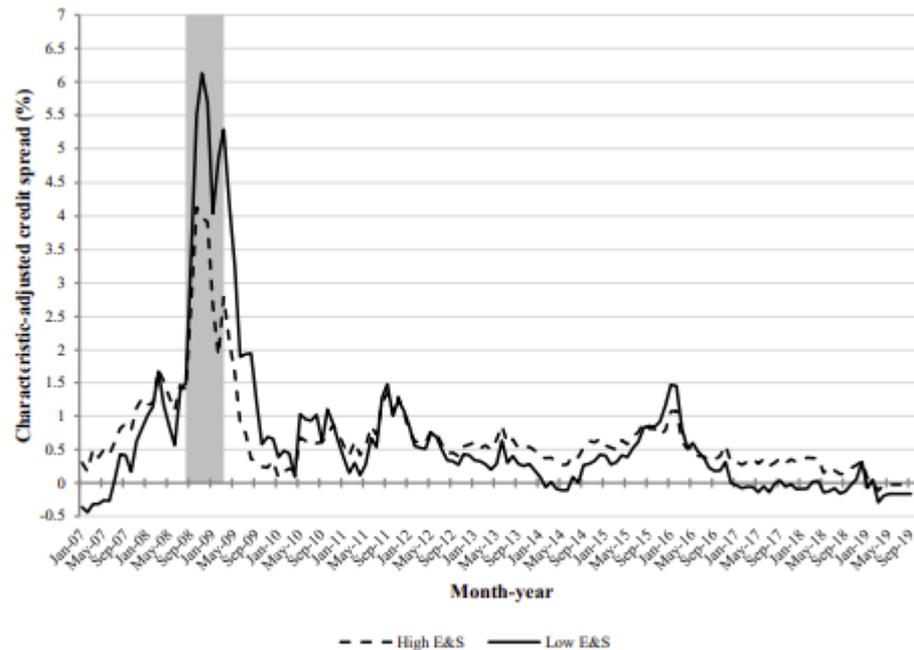
# The Bond Market is Our Way Out of the Fog

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- Bondholders don't get the vote and have limited upside in terms of corporate earnings, have a lot to lose from "major negative events".
  - ESG scores and bond yields should be inversely correlated
- Amiraslani, Lins, Servaes and Tomayo (2017, ECGI 2021) provide a very extensive analysis of corporate bonds that confirms the existence of lower corporate bond yields for firms with higher E and S scores.
  - G scores were not statistically significant.
- Henke (JoBF, 2016) finds that bond mutual funds with higher ESG scores for their portfolio companies outperformed on a *risk adjusted basis*.
- Numerous financial firms have reported better performance for bond portfolios with ESG tilts (Barclays, Blackrock)
- The only way for lower yields to provide better risk adjusted performance is for the risks to be lower, consistent with our hypothesis.

# Magnitude of the Effect

- Amiraslani, et. al. paper show the credit spread of high ESG score firms was almost 2% a year lower than low ESG score firms during the GFC.
  - The difference was much smaller but highly statistically significant through the sample period.



# How Much Less Risk for a Bond?

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- In our March 2020 webinar, [Estimating an Investor's Volatility/Return Tradeoff: The Answer is Always Six \(northinfo.com\)](#) we derive the typical investor tradeoff between expected annual return and volatility.
  - Rubinstein (JoF, 1975)
  - Wilcox (JPM 2002, JPM 2003)
- If investors are willing to accept 1% a year lower bond yield they do so with the expectation that the credit related volatility of the bond will be  $(1 * 6) = 6\%$  lower.
- The expected lower credit risk could manifest as either a lower probability of default or as a lower “loss given default” (higher partial payment).
  - We can summarize the expectation for the true payoff probability distribution  $P$ , as the “risk neutral” measure  $Q$  (default probability adjusted for an “all or nothing” payoff)
  - $Q$  is approximately the price of the bond divided by what the price of the bond would be if the credit spread went to zero (i.e. like a Treasury).

# Connecting Bond Risk to Equity Risk

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- Merton (JoF, 1974) provides the contingent claims model for corporate debt.
  - Equity of a firm is a call option on the assets of the firm with a strike price of the debt and an expiration date of the debt maturity.
  - You can think of a corporate bond as a portfolio consisting mostly of a riskless (i.e. Treasury) bond and a smaller portion of firm equity.
  - If the firm goes bankrupt and the equity portion becomes worthless, providing the “loss given default” of the bond.
  - The corporate bond has equity attributes equal to  $(LGD * Q)$  of the equity.
    - If firm X has equity beta 1, and there exists an X bond with  $LGD = 30\%$  and  $Q$  of  $90\%$ , the equity beta of the corporate bond (EBB) is .27
  - This approach allows credit risk of corporate debt to be tied to equity risk and vice versa.
- diBartolomeo and Belev (2013, 2019) and Bodie, Gray, Merton (2004) provide extension to address credit risk of sovereign debt that could be used in similar fashion to recover expected volatility changes in national equity indices.

# Our Combined Formula

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- If we know how much less yield a corporate bond with a high ESG score yields compared to other bonds of similar rating, we can estimate investor's expectations about the volatility of the equity compared to otherwise similar firms.

$$\text{Incremental Volatility of Firm Equity} = (\text{Incremental Bond Yield} * 6) / (\text{EBB})$$

- Clients should note that EBB for any bond is readily observable in the data from the Northfield "Everything, Everywhere" risk model.
- We currently analyzing our own credit spread (OAS) and EBB data over the history of the EE model to confirm the previously published results regarding the relationship of ESG scores and credit spreads.
  - The hypothesized relationship is consistent with previous related studies such as diBartolomeo (JOI, 2010)

# Real World Application for Equity Risk Models

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- Many years ago, we were asked numerous times how we were going to account for ESG in equity risk modeling.
  - We never did because the concept of an ESG factor in a factor model is unproven at best.
  - Most studies show that traditional factors are sufficient to explain what's going on, but don't handle the cumulative impact of "large event risk" to specific firms.
  - Of course, "beauty is in the eye of the beholder", so we can ascribe fundamental differences between firms as arising from E, S, or G.
    - For example, if interest rates go up and firms with lots of debt underperform firms with no debt, we can *assume* that's the result of better corporate governance.
- Applying the foregoing analysis allows Northfield to immediately incorporate a long term ESG risk adjustment to individual firm volatility in the same way we use text analytics in our Risk Systems That Read® method to adjust volatility to short term news events.

# Conclusions

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- This presentation asserts a clear inverse relationship between ESG scores at the firm level, and the risk of both equities and corporate bonds.
- It avoids the ambiguity of the large academic literature on the impact of SRI/ESG on equity returns, by focusing on the asymmetric and long-term nature of corporate bond risk.
- To convert well documented bond market data into risk adjustments, we rely on a well recognized description of investor utility to derive an implicit level of risk aversion from portfolios.
- We convert differences in bond yields associated with ESG scores into apparent differences in the perceived risk of a corporate bond.
- Once we have the adjustment for a bonds, we can calculate the parallel adjustment in equity risk at the firm level via the “contingent claims” method of Merton.