
The materiality of ESG factors for equity investment decisions: academic evidence



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Executive Summary

This report presents the results of a study performed by the European Centre for Corporate Engagement (ECCE) at Maastricht University in cooperation with NN Investment Partners (NN IP) to gain new insights into the usefulness of environmental, social and governance (ESG) data for investment professionals. This unique empirical study focuses on evaluating the performance of global equity portfolios that are formed using ESG criteria. The most important findings are summarized below.

- Standard ESG ratings/scores typically used in equity selection tend to be higher for larger companies and vary across industries. Using ESG criteria in portfolio selection without the proper adjustments may therefore lead to undesirable size and industry tilts in equity portfolios.
- Levels of ESG scores display limited variation over time, illustrating that ESG factors are often long-term oriented. This supports the intuition that changes in ESG scores can be more informative about future returns than levels.

Adjusting for size and industry bias, we tested portfolio selection rules in the period from January 2010 through September 2014 based on various ESG (sub)criteria, with the following main results:

- Portfolios comprising stocks with high ESG score levels underperformed their lower-scoring counterparts in the majority of cases
- Changes (or “momentum”) in ESG performance proved to be a more fruitful selection criterion but the performance improvement achieved through the use of momentum in scores revolved mainly around governance measures.
- Return differences between stocks with strong ESG momentum and those with weak momentum were largest among stocks that scored medium in terms of ESG levels, suggesting that stock selection benefits from joint consideration of levels and changes in ESG scores.
- Excluding firms with controversial behaviour from the universe has helped improve performance in the research period past years. We find that returns improved further when not only “severe” and “high” controversies but also “significant” controversies are excluded.

that are formed on the basis of various ESG criteria. Earlier academic empirical research suggests that to a certain extent the ESG score levels of publicly listed firms reflect intangible benefits of better corporate sustainability and governance. Because the benefits are believed to be largely intangible and materialize slowly, it has also been suggested that ESG performance influences the fundamental value of a corporation in a way that financial markets are slow to recognize. Much of that evidence stems from studies documenting positive risk-adjusted return (“alpha”) associated with U.S. stock portfolios that take ESG information into account, and from studies showing that firms with strong ESG levels earned higher profits than analysts anticipated.¹

While the results of earlier research suggest that ESG information can be useful for active portfolio managers who seek to enhance the performance of their portfolios, studies so far also have several limitations that put their relevance for investment practice into question:

- They have largely focused on U.S. equities, and it remains an open question whether ESG factors matter for the returns of global equities.
- Studies that evaluate ESG-based investment strategies typically form basic portfolios by annually selecting stocks that score high based on ESG criteria and possibly shorting those that score low. No adjustments in the portfolio construction method are made for size, investment style (value, growth, momentum) and industry tilts that may result from the nature of ESG scores.
- Surprisingly, researchers have only paid attention to portfolios that are formed based on levels of ESG scores, even though theoretically changes in ESG scores are more likely to convey news about future returns. Information about levels of a firm’s ESG performance may simply be the result of an ESG improvement or deterioration that happened in the past and therefore might already be reflected in the company’s stock price.
- The universe of stocks that is screened using ESG metrics does not always match securities included in commonly used benchmark indexes.
- Studies so far have been inconsistent in their choice of ESG data provider for testing investment portfolios’ compliance with specific ESG criteria. Research suggests that different

Introduction

This study, an ECCE-NN IP collaboration, is the first comprehensive investigation into the performance of international equity portfolios

¹ Examples include A. Edmans (2011), “Does the Market Fully Value Intangibles? Employee Satisfaction and Equity Prices, *Journal of Financial Economics*”; R. Eccles, I. Ioannou and G. Serafeim (2013), “The Impact of Corporate Sustainability on Organizational Processes and Performance”, Harvard Business School.

ESG data providers vary widely in their measurement philosophy and coverage.²

The ECCE-NN IP study extends current research in three ways. First, we analyze an *international* dataset that covers more than 3,000 firms from developed markets. Second, this study evaluates not only portfolios that are formed based on levels of firms' ESG scores but also portfolios derived from changes or momentum in ESG scores. Third, the study uses two well-established ESG research databases from Sustainalytics and Governance Metrics International (GMI, now part of MSCI) that allow us to integrate a wide range of aggregate and disaggregated ESG scores in the analysis. The data allow for an examination of ESG portfolios in the period from January 2010 through September 2014. Our main analyses focus on Sharpe ratios as the relevant performance metric.

The chapter *Data description* sheds more light on the nature of the data used in this study. In particular, it outlines how individual ESG indicators are aggregated to various sub-scores and eventually to an aggregate ESG score. An inspection of the ESG data subsequently shows that ESG scores vary significantly by industry and by size. The implications of size and industry effects in ESG scores are taken into account in the portfolio construction and performance evaluation methods that are central to this study.

The following chapter presents the main results of this study. For a wide range of different ESG criteria, it reports the difference in Sharpe ratio between an industry- and size-controlled portfolio that scores high on a specific ESG criterion and the low-scoring counterpart. We look at portfolios that integrate information based on ESG levels as well as momentum. In addition, this section shows results excluding equities associated with specific ESG "controversies". This section helps to understand how exclusions based on controversy criteria affects investment performance.

The final chapter concludes this report and highlights the study's most significant implications.

Data description

Sustainalytics provided us with all indicators underlying their aggregated ESG scores, known at the start of each monthly interval running from January 2010 to September 2014.³ The ESG database covers all companies scored by Sustainalytics that are located in one of the 23 MSCI Developed Markets countries. On average, our sample

² See Chatterji, A.K., R. Durand, D.I. Levine, and S. Touboul (2015), "Do Ratings Converge? Implications for Managers, Investors, and Strategy Researchers", *Strategic Management Journal*.

³ Because of a major change in data structure it is not possible to include ESG data before 2009 for the type of analyses we perform.

comprises 3,319 firms each month. Sustainalytics collects a set of *individual ESG indicators* for each firm in their universe. These indicators are used to measure firms' ESG performance along a set of topics based on a specific weighting scheme. Another weighting scheme is subsequently used to transform topic scores to three firm-level *sub-scores*: an environmental score (E), a social score (S), and a corporate governance score (G). Finally, an overall ESG score is derived, representing a weighted average of the three sub-ratings.

Sustainalytics also provides indicators on ESG "controversies", which in practice often form the basis for exclusions of certain stocks from investment portfolios. Controversies refer to controversial behavior of companies, such as environmental pollution, bribery and corruption, human rights issues, etc. We considered three categories of controversies based on the severity and frequency of a specific issue. Users should be aware that these controversies are also part of the overall ESG scoring methodology. However these do not have a large impact on the final ESG score.

In addition to Sustainalytics data this study make use of corporate governance data provided by Governance Metrics International (GMI), which has a richer history in traditional corporate governance measurement.⁴ We will henceforth refer to this specific governance measure as "GMI Governance Score".

We match the Sustainalytics and GMI data to financial and accounting data from Datastream using ISIN codes as company identifiers. From Datastream, we take the total return index of a stock to calculate individual total stock returns with reinvested dividends, market capitalization, and profitability measures.

Main results

Results based on Sustainalytics data

This section examines stock selection based on both the level and the change in ESG scores that companies receive over time. Some academic evidence already suggests that the way investors may respond to *changes* in ESG scores depends on the firm's current level of ESG performance. For example, investors may respond differently to improvements in ESG performance for a firm that was already performing well on ESG issues, than to equally material improvements displayed by a firm that has so far had a medium ESG track record.

To accommodate this intuition, this section reports on an analysis of stocks that are selected based on changes in ESG performance while also taking into account the initial level of their ESG scores. Stocks are sorted on their ESG score into three equally sized terciles (L1 "Low",

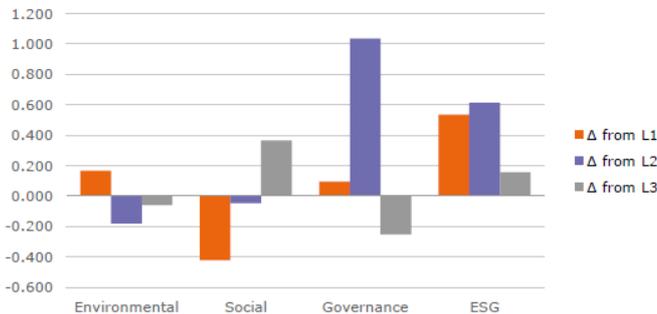
⁴ While GMI covers information about firms' governance structures dating back to 2003, this study focuses on those firms and years in GMI that remain after a match with the Sustainalytics universe.

L2 “Medium” and L3 “High”). Subsequently, within each ESG tercile, stocks are sorted into three portfolios based on the change in ESG score. Per ESG tercile level, we take a “difference portfolio” that is long a portfolio of stocks with strongest ESG momentum and short the lowest-ranked counterpart.

Figure 1 reports Sharpe ratios regarding the various difference portfolios, where the portfolios are constructed using a universe of stocks that already have a specific initial level of ESG performance.

Figure 1: Using both levels and changes in ESG score to form portfolios

Sharpe ratio on a difference portfolio that is based on a subset of stocks with low (L1), medium(L2) or high (L3) initial ESG levels; long in stocks with strong ESG momentum and short in stocks with weak ESG momentum.



Source: ECCE & NN IP Research, Sustainalytics, Datastream (1/2010 - 9/2014)

A look at portfolios that are constructed using the aggregate ESG score indicates that the Sharpe ratios for the difference portfolios are not the same across the subsets of firms that differ in ESG levels. We find a relatively strong Sharpe ratio of 0.6 for the difference portfolio that is constructed by means of ESG momentum, but only when using firms that score medium in terms of ESG levels (L2). Furthermore, the Sharpe ratio becomes even larger when both levels and changes in the governance (G) subscore are used to form portfolios. The Sharpe ratio of the portfolio long strongest momentum and short weakest momentum exceeds 1, provided that stocks were selected from a subset that scored medium on levels of the Governance score (L2).

Using levels and changes jointly in environmental and social scores to form portfolios generally did not reveal equally positive performance differences between stocks with strong momentum in those with weak momentum.

The results suggest that the combination of ESG levels and changes can be incrementally informative about the future risk-adjusted returns of stocks and stock portfolios.

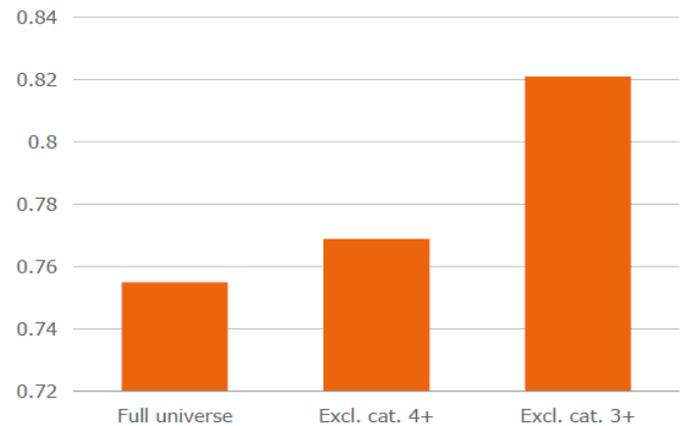
We also looked at the effects on investment returns of excluding from the investable universe those firms with ESG controversies that are “severe” to “significant”. We first compared the full universe with excluding firms with Category 4 (high) and 5 (severe) controversies. We subsequently excluded Category 3, 4 and 5 exclusions, because

Category 3 controversies are still considered significant by data provider Sustainalytics.

What becomes clear from Figure 2 is that excluding Category 4 and 5 controversies led to a modest increase in Sharpe ratio. Adjusting for size and industry bias⁵, the exclusion of Category 3, 4 and 5 controversies led to a much higher Sharpe ratio, about 10% higher compared to the full universe.

Figure 2: Excluding controversies from the investment universe

Annualized Sharpe ratios of controversy-free portfolios



Source: ECCE & NN IP Research, Sustainalytics, Datastream (1/2010 - 9/2014)

Results based on GMI data

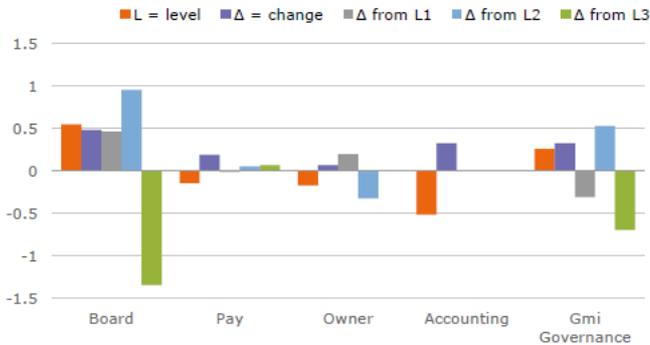
This section focuses entirely on portfolios that are formed using the governance data from GMI. This data measures the presence of governance characteristics such as undersized boards, combined CEO/chairman positions, and golden parachutes. The database reports on four separate governance dimensions; board accountability and effectiveness (board), executive pay policy and oversight (pay), ownership structure and control (ownership), and integrity of accounting practices (accounting).

Figure 3 presents the main results. The first notable observation concerns the usefulness of *levels* of GMI scores. A difference portfolio that is long in stocks with high GMI governance levels and short in those with lowest levels produced a Sharpe ratio of about 0.25. It does appear however that this performance difference is mainly driven by the information content of GMI’s board indicators: of all the difference portfolios that we formed based on GMI sub ratings, only the difference portfolio formed on the Board sub-score produced a positive annualized Sharpe ratio of just above 0.5.

⁵ Regions have been also taken into account in a robustness test.

Figure 3: Sharpe ratios – GMI governance portfolios

Sharpe ratio of a difference portfolio that is based on a subset of stocks with low (L1), medium (L2) or high (L3) initial GMI Governance levels: long in stocks with strong Governance momentum and short in stocks with weak Governance momentum.



Source: ECCE & NN IP Research, GMI, Datastream (1/2010 - 9/2014)

Sorting on *changes* in governance generally leads to difference portfolios with positive Sharpe ratios, although the performance can be small depending on the governance score or sub-score used for stock selection.

When levels as well as changes in Governance score were used, the results are mixed. They suggest that mainly among firms that score medium (L2) on the aggregate GMI governance score and the board sub-score, difference portfolios formed on momentum in these scores generated a positive Sharpe ratio. For example, a difference portfolio that is formed on momentum in board levels produced a Sharpe ratio of nearly 1, when we exclusively considered stocks with medium board scores (L2). But among the firms that initially scored high on these two governance categories (L3), a difference portfolio derived from momentum in scores produced negative Sharpe ratios.

Conclusion

This report summarizes the results from the ECCE-NN IP research collaboration to gain new insights into the materiality of ESG scores for investors. More specifically, we extended the existing literature by (1) using an international dataset, (2) evaluating a wide range of ESG criteria to form portfolios (3) assessing the informativeness of not only levels of ESG scores but also changes (momentum) in ESG scores, and (4) an analysis of controversy-free portfolios (exclusions based on varying degrees of controversy severity).

A first inspection of the ESG data from Sustainalytics and the governance data from GMI revealed that ESG data display strong industry and size effects, and limited variation over time. These features of the data provide a strong motivation to construct

portfolios that are industry- and size-controlled. Moreover, they reinforce the intuition that changes in ESG scores can be more informative about future returns.

Concerning industry- and size-controlled portfolios that are formed based on various ESG measures, the main findings of this study can be summarized as follows⁶:

- In most cases the portfolios that comprise stocks with high *levels* of ESG scores had lower performance than their low-ranked counterparts.
 - A portfolio comprising stocks that score high on *momentum* in ESG scores performed better than its low-ranked counterpart. However, a deeper look at subsets of ESG scores suggests that mainly the governance component drives this performance difference.
 - Using levels *and* momentum in ESG scores may help to better distinguish stocks with higher future returns from those with lower returns. For example, return differences between stocks with high momentum in certain ESG measures and those with low momentum tend to be concentrated among stocks that score medium on ESG. This effect particularly holds when governance measures are considered for portfolio construction.
 - A separate analysis suggests that exclusion of controversial companies helps to improve the portfolios risk-adjusted returns.
- The results have a number of implications for investment practitioners:
- The results of this study suggest that certain ESG information can be informative to investors who seek to improve the risk-adjusted performance of their portfolios; portfolio managers may not necessarily improve performance by looking at (high) levels of ESG scores alone. When it comes to enhancing investment performance there is potential for the combined use of levels and changes in ESG measures.
 - It is difficult to argue that any one specific ESG factor is informative in selecting equities that generate higher returns. Nevertheless, (momentum in) certain governance measures from both Sustainalytics and GMI may be reasonably informative.

⁶ While several of these results are also statistically significant we note that significance tests in this study are hindered by the limited number of return observations. Therefore, it is recommended that the role of ESG factors in enhancing investment performance continue to be studied in future research as more data becomes available.

- A relatively simple way to improve portfolio performance has been the exclusion of ESG controversies as identified by Sustainalytics. Hence, it appears that contrary to popular belief exclusion can enhance rather than harm investment performance depending on the issues considered.

We recommend that future research further investigate the materiality of ESG factors and controversies within sectors, emerging markets and other asset classes.

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About NN Investment Partners

NN Investment Partners is the asset manager of NN Group N.V., a publicly traded company listed on Euronext Amsterdam. NN Investment Partners is headquartered in The Hague, the Netherlands. NN Investment Partners in aggregate manages approximately EUR 187 bln* (USD 204 bln*) in assets for institutions and individual investors worldwide. NN Investment Partners employs over 1,100 staff and is active in 16 countries across Europe, Middle East, Asia and U.S.

On 7 April 2015, ING Investment Management was renamed NN Investment Partners. NN Investment Partners is part of NN Group N.V., a publicly traded corporation. ING Group holds 14.1% of the outstanding shares (net of treasury shares) in NN Group. ING Group intends to divest the remaining shareholding in NN Group before 31 December 2016, in accordance with the timeline agreed between ING Group and the European Commission.

* Figures as per 31 December 2015

Visit www.nnip.com for more information.

About ECCE

The European Centre for Corporate Engagement (ECCE) at Maastricht University's School of Business and Economics is the world's leading research institute on sustainable finance and responsible investing. ECCE offers high-quality research on the impact of environmental, social, and governance (ESG) standards on the pricing of assets in financial markets. Moreover, ECCE studies the different ways investors can engage with the companies they invest in.

The mission of ECCE is to develop, communicate, and promote a thought-provoking and innovative body of knowledge concerning sustainable business and finance, through high-quality research, teaching, training, international networking, conferences, and other conventional outlets. Its core purpose is to encourage an ongoing dialogue between all parties capable of contributing to sustainable development, including capital markets investors, financial analysts, corporate managers, consultants, academic institutes, governmental bodies, and NGOs.

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