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ASSESSING THE IMPACT OF ESG IN FIXED INCOME

A DISCUSSION WITH DR. NICK MOTSON OF BAYES BUSINESS SCHOOL ON THEIR LATEST RESEARCH STUDY WHICH CONSIDERS THE CASE FOR APPLYING ESG FACTORS TO A FIXED INCOME PORTFOLIO

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DR. NICK MOTSON



Dr. Nick Motson is an Associate Professor at Bayes Business School at City University.

He holds a BSc from Bayes Business School, an MSc from London Business School, and a PhD from Bayes Business School. Following a 13-year career as a proprietary trader of interest rate derivatives in the City of London for various banks, including First National Bank of Chicago, Industrial Bank of Japan and Wachovia Bank, he returned to Bayes in 2005 to pursue his doctoral studies. Upon completion of his PhD, he joined the faculty of finance full time in 2008.

Dr. Motson's research interests include asset management, portfolio construction, hedge funds, alternative assets, and structured products. In 2009, he was awarded the Sciens Capital Award for Best Academic Article for his paper in The Journal of Alternative Investments 'Locking in the Profits or Putting It All on Black? An Empirical Investigation into the Risk-Taking Behaviour of Hedge Fund Managers'.

From 2016 to 2021, Dr. Motson was the Associate Dean for the MSc Programme, responsible for 23 traditional and one online master's degrees with a total of over 1,500 students per year. He has taught extensively at masters level on alternative investments, derivatives, fixed income and structured products and in recognition of the quality of his teaching he was nominated for the Economist Intelligence Unit Business Professor of the Year Award in 2012 and awarded the Vice Chancellor's University Education Excellence Award in 2014.

As well as teaching and researching at Bayes, Dr. Motson consults for numerous banks and hedge funds and has provided research or training for clients.

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• Exclusion policies may have a minimal effect on investment returns, and ESG factors can have a positive effect on investment performance over time – but more research is needed

ASSESSING THE IMPACT OF ESG IN FIXED INCOME

WE ASKED DR NICK MOTSON, ASSOCIATE DEAN AT BAYES BUSINESS SCHOOL, CITY UNIVERSITY, TO DISCUSS THE MAIN FINDINGS FROM BAYES' RESEARCH INTO THE IMPACT OF ESG FACTORS ON FIXED INCOME PERFORMANCE AND SHARE HIS THOUGHTS ON THE PRACTICAL IMPLICATIONS FOR INSTITUTIONAL INVESTORS.

THE RESEARCH OBJECTIVES: EXPLORING HOW ESG FACTORS AFFECT RETURNS

Fixed income assets are the core allocation for many, if not most, institutional investors. However, much of the academic research into how environmental, social and governance (ESG) factors influence investment performance has focused on listed equity markets rather than fixed income. This is understandable, given the transparency and simplicity of equity markets: the data is clean and each company usually has just one share class.

Part of the reason for the paucity of studies in fixed income is the complexity. Companies issue multiple bonds at a time with varying maturities, meaning benchmarks change far more often than those of listed equity markets. In addition, ESG data for fixed income securities can be patchy. This means researchers in this space must first ensure they have a reliable set of data to analyse.

Last year, Bayes Business School was commissioned by Insight Investment to 'assess the implications of applying ESG factors within a fixed income portfolio'. The study aims to help institutional investors answer two fundamental questions:

- 1. Would adopting an ESG strategy be detrimental to investment performance?
- 2. How do different ESG implementation options impact investment results?

As part of the study, we also conducted a review of other fixed income studies so that we could compare findings. In our study, we wanted to dig deeper to better understand the drivers of performance.

CREATING A ROBUST BENCHMARK FOR ANALYSIS

Together with my colleagues Andrew Clare (Professor of Asset Management) and Aneel Keswani (Professor of Investment Management), we set about constructing a robust set of data on which to base the research and from which we would be able to draw meaningful conclusions.

We are grateful to IHS Markit¹ for kindly providing the constituents of the iBoxx EUR Corporates bond index, to which we applied corporate ESG data from Refinitiv to construct a hypothetical ESG reference portfolio ('benchmark' for the purpose of our study). To help us conduct more granular analysis, we classified each issue into the individual environmental, social and governance categories, an overall ESG category, an ESG controversies category and then into the 10 sub-categories (such as emissions).

CHOOSING AN APPROPRIATE TIME PERIOD

As illustrated in Figure 1, the ESG data coverage (proportion of bonds in the index with a Refinitiv ESG score) has steadily grown over time with coverage now at 80%-90% of the market. Conducting studies going back to the early 2000s would exclude a large part of the market, so we decided to build our benchmark starting with 2012, which gave us 10 years' worth of data.

Figure 1: Sufficient ESG data coverage to analyse 10 years of data²



ARE THERE ANY SIGNIFICANT DIFFERENCES BETWEEN THE BENCHMARK AND THE BROADER INDEX?

This new custom benchmark is very similar to the iBoxx EUR Corporate Index (see Figure 2). It has a marginally higher return and risk profile over the 10 years covered by our study, which may be caused by a slightly longer average duration.





	iBoxx EUR Corp	Bonds With ESG Data
Return (annualised)	3.63%	3.91%
Vol (annualised)	3.72%	3.95%
Sharpe Ratio	0.97	0.99
# Bonds	2,099	1,402
% of Weight	100%	66%
Rating (AAA =1 to BBB=4)	3.33	3.34
Duration	5.04	5.32
Yield	1.27%	1.32%
Spread To Benchmark Curve	133	134

²Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

¹ Please see end disclaimer.

WILL COMPARISON TO OTHER STUDIES BE INFLUENCED BY THE CHANGE OF ESG SCORES OVER TIME?

Next we analysed the evolution of ESG scores over the course of the decade in focus. We wanted to understand whether our final results were likely to be driven by changes in the underlying data or our own methodology, which would enable us to better compare our results to other studies which had used different time periods.

Looking at each of the environmental, social and governance pillars as well as the combined ESG score, we found there was little variation over time. The aggregate social and governance scores for our bond universe marginally improved since 2012, while the environmental score slightly decreased (see Figure 3).



Figure 3: ESG scores over time³

Overall, this meant that we did not expect a significant difference from previous studies due to variations in scores. Any differences would instead be down to methodology or other factors.

³ Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

THE IMPACT OF EXCLUDING CONTROVERSIAL SECTORS

The first ESG strategy we analysed was a portfolio which excluded the controversial sectors that are commonly removed by investors: tobacco, mining, defence, and oil and gas producers.

Historical returns from such a portfolio were statistically identical to the benchmark (see Figure 4). The main reason for this result is that these sectors only account for a small proportion (6.2%) of the benchmark. This is a positive finding for investors that use an exclusionary approach, as it shows that, in this sample over the past 10 years, it would not have detracted from investment returns.

Figure 4: Excluding controversial sectors would not have hurt historic performance⁴

We shall return to the exclusion factor later in this paper.

⁴Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

BONDS WITH HIGH ESG SCORES OUTPERFORM – BUT WE NEED TO DIG DEEPER

In our study we split the universe of bonds into quintiles, based on each security's combined ESG score. We chose quintiles, instead of a smaller number of broader bands which are more common, to avoid performance drivers being masked by broader groupings and to allow us to investigate the drivers of performance more thoroughly.

The figures disclosed that the top 20% of bonds by ESG score outperformed the bottom 20% by roughly 3% – a statistically significant margin – over the decade we studied (see Figure 5).

Figure 5: The classic academic approach yields similar results to previous studies – that bonds with the best ESG scores outperformed bonds with the worst ESG scores⁵

Many previous studies of ESG performance have stopped at this point. After reaching a statistically significant result, there is an obvious conclusion to draw: bonds that scored better on ESG criteria outperformed those that did not over the past decade. This finding is in line with previous studies of listed equity markets.

However, the classic academic approach does not always tell the whole story.

SURPRISING RESULTS REQUIRE GREATER SCRUTINY

There were some surprising outcomes of this stage of the study: for example, while the top quintile outperformed the bottom quintile, both segments outperformed our benchmark index.

In addition, as Figure 5 illustrates, the bulk of the top quintile's outperformance came towards the start of the period. More recently, the performance differential has been much smaller. Given the more recent increase in investor interest in ESG themes, we had hypothesised at the outset that increased flows into ESG products might have boosted the performance of assets with existing strong ESG scores – but this was not the case.

On top of this, when isolating the environmental pillar and running the same analysis, the study found that the bottom quintile had experienced a positive performance effect from the environmental pillar.

For the research to have a practical application, it was important to drill down into the detail of where the outperformance may have come from.

⁵Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

TAIL-RISK MANAGEMENT INFLUENCES THE OUTPERFORMANCE

One potential explanation for the source of the outperformance of the top quintile versus the bottom quintile is that the tail of negative performance is much deeper for the low-quintile bonds. To investigate this, we looked at the tail of the distributions of both groups. The study examined two risk measurements of tail risk: value at risk (VaR) and conditional value at risk (cVaR) at the 95% confidence level. VaR is calculated at the lowest 5% of returns, while cVaR calculates the average of the bottom 5% of results. In short, the greater the number (more negative in this case), the greater the risk.

VaR for the top quintile was -0.89%, compared to -1.05% for the bottom quintile, while cVaR was -2.34% for the top and -2.6% for the bottom. This illustrates that the tail end of returns had more of a negative effect on the bottom quintile than it did on the top quantile.

	1	2	3	4	5	Benchmark
Return (annualised)	4.23%	3.67%	3.82%	3.87%	3.95%	3.91%
Vol (annualised)	3.93%	3.75%	4.00%	4.11%	4.17%	3.95%
Sharpe	1.07	0.98	0.96	0.94	0.95	0.99
VaR 95	-0.89%	-0.90%	-0.96%	-0.83%	-1.05%	-0.87%
cVaR 95	-2.34%	-2.32%	-2.40%	-2.63%	-2.60%	-2.43%
# Bonds	306	300	291	260	245	1,402
% of Weight	20%	20%	20%	20%	20%	100%
Rating (AAA =1 to BBB=4)	3.44	3.41	3.32	3.26	3.28	3.34
Duration	5.28	5.31	5.18	5.42	5.4	5.32
Yield	1.39%	1.24%	1.30%	1.30%	1.35%	1.32%
Spread To Benchmark Curve	142	127	134	132	137	134
Factor score	81	69	59	49	35	59
Significance test	1	2	3	4	5	_
Return (annualised)	7%	16%	26%	40%	41%	

⁶Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

SECTOR EFFECTS ARE IMPORTANT AND NEED TO BE DISENTANGLED FROM ESG EFFECTS

The differences we have identified above between the quintiles could potentially be derived from two sources: tilting towards different sectors relative to the benchmark ('sector effect') or tilting towards companies with a higher ESG score within each sector ('ESG effect').

Figure 7 separates out the sector effect from the ESG effect for the top and bottom quintiles. For the top quintile, some of the historical outperformance relative to the benchmark is attributable to the sector effect, but a larger amount comes from the ESG effect. However, for the bottom quartile, all the benchmark-relative outperformance is due to the sector effect with the ESG effect being negative.

Therefore, there is an ESG effect: the observed outperformance of the top quintile group relative to the bottom quintile is not solely due to sector effects.

Figure 7: There is an ESG effect after taking into account sector effects⁷

DO WE SEE SIMILAR PATTERNS AT THE INDIVIUAL E, S AND G PILLAR LEVELS?

Splitting out the effects by each pillar – environmental, social, and governance – the data showed that the environmental pillar was particularly strong. Those that scored highly for environmental factors were statistically significantly more likely to outperform the benchmark, while the lower-ranked companies underperformed. Downside or tail risk, as measured by VaR, was the key driver.

For the social and governance pillars, the results were far less clear. Better social or governance scores were not correlated with better investment returns. However, when adjusting for sector effects, the study showed that ESG factors had provided a positive boost for the top quintile and detracted from the bottom quintile when split by social scores. This was not repeated for governance scores.

⁷ Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

TILTING PORTFOLIOS TO HIGH ESG SCORES HAS AN IMPACT

As noted earlier, removing commonly excluded companies from our benchmark did not influence the overall investment result over our 10-year period. To explore the exclusionary approach further, we analysed how removing the lowest-ranked companies from the benchmark would affect the results.

We found that, unless investors only focused on the top 20% of bonds by ESG score, there was no discernible difference in outcome – certainly not in a statistically significant way. Excluding 80% of securities in a fixed income benchmark is not a practical approach due to liquidity and default risks that would become far more acute with such a concentrated portfolio.

Instead, we sought to explore how tilting a portfolio to favour stronger ESG scores could influence the return. To build a tilted portfolio, we used a formula similar to that used by MSCI in some of its Smart Beta Equity indices to emphasise securities with higher ESG scores and reduce weightings in those with lower scores.

Having run the same exercises as above, we found the approach worked well – **tilting towards higher ESG scores improved performance, with the environmental factor making the largest contribution**. Overall, we were able to enhance the return with the same level of risk as our benchmark, and this was driven by ESG factors rather than sector exposures (see Figure 8).

Figure 8: Tilting towards higher ESG scores improved performance, with the environmental factor making the largest contribution⁸

⁸Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

A LOOK AT SOME UNEXPECTED RESULTS

When analysing studies such as this, it is important to acknowledge the results that were unexpected or disappointing, rather than just cherry-pick the best findings.

As previously noted, social and governance scores have had less of a correlation to better investment returns than environmental scores over the decade analysed in the study.

For instance, when analysing the subsets of each of the three ESG pillars, the study found that those companies with the highest scores for human rights significantly underperformed the benchmark with almost 100% statistical certainty (see Figure 9). This means that, **if investors had held bonds based on a company's good human rights track record, they would have been penalised for that over the past decade from an investment return perspective.**

	Quintile: 1 = highest, 5 = lowest				_	
	1	2	3	4	5	Benchmark
Return (annualised)	3.44%	3.87%	4.28%	4.05%	3.90%	3.91%
Vol (annualised)	3.72%	4.09%	3.97%	4.08%	4.13%	3.95%
Sharpe Ratio	0.93	0.95	1.08	0.99	0.95	0.99
# Bonds	263	280	276	272	310	1,402
% of Weight	20%	20%	20%	20%	20%	100%
Rating (AAA =1 to BBB=4)	3.19	3.35	3.35	3.38	3.43	3.34
Duration	5.25	5.47	5.25	5.18	5.44	5.32
Yield	1.19%	1.29%	1.35%	1.35%	1.39%	1.32%
Spread To Benchmark Curve	124	129	139	139	141	134
Factor score	95	86	76	60	20	67
Significance test	1	2	3	4	5	_
P-Value	0%	41%	2%	29%	49%	

⁹Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

Similarly, the study explored companies' community score, which Refinitiv defines as the corporate commitment to being good citizens, protecting public health, and respecting business ethics. Those companies that performed the worst on this score had the highest return on average over the period, as shown by the outperformance of the bottom quintile (see Figure 10).

Figure 10: Community score results – quintile sorts¹⁰

	1	2	3	4	5	Benchmark
Return (annualised)	3.88%	3.96%	3.82%	3.63%	4.26%	3.91%
Vol (annualised)	4.06%	3.84%	3.83%	4.11%	4.10%	3.95%
Sharpe	0.95	1.03	1	0.88	1.04	0.99
# Bonds	274	269	284	292	282	1,402
% of Weight	20%	20%	20%	20%	20%	100%
Rating (AAA =1 to BBB=4)	3.25	3.26	3.41	3.36	3.44	3.34
Duration	5.37	5.3	5.24	5.44	5.24	5.32
Yield	1.26%	1.29%	1.31%	1.30%	1.42%	1.32%
Spread To Benchmark Curve	131	132	135	131	144	134
Factor score	97	91	82	63	31	73
Significance test	1	2	3	4	5	_
P-Value	43%	37%	30%	3%	3%	

¹⁰ Source: Calculations by Bayes Business School, based on data from Refinitiv and IHS Markit.

A SUMMARY OF THE KEY FINDINGS

This research is in line with many previous studies that have shown ESG factors to have a positive effect on investment performance over time. However, while the study broadly agrees with these previous findings, we believe there are many subtleties that are missed when researchers just compare the top and bottom segments of a sample.

In addition, sector effects need to be disentangled from ESG factors to ascertain precisely where the outperformance drivers are within a group of securities. Environmental scores, for example, were shown to have a far greater effect than social or governance factors over the past decade.

Tilting a fixed income portfolio in favour of higher ESG scores would have historically helped in terms of investment returns. While there is no guarantee it will do so in the future, our study shows it would have worked historically in the decade since 2012.

Exclusion policies have been shown to have a minimal effect on investment returns. This is a positive result for those seeking to divest or exclude controversial sectors such as oil and gas or arms manufacturers, as to do so is unlikely to have an impact on returns. However, excluding poor ESG performers also did not have a noticeable impact on returns in our research unless taking a highly concentrated best-in-class approach, which is often unfeasible in fixed income investing.

As more and better ESG data is produced and more studies focus on the fixed income sector, it is hoped that more light can be shed on how such factors can be used to benefit investors with a sustainability objective.

//

Excluding poor ESG performers did not have a noticeable impact on returns in our research unless taking a highly concentrated best-in-class approach, which is often unfeasible in fixed income investing

FIND OUT MORE

Institutional Business Development businessdevelopment@insightinvestment.com +44 20 7321 1552

European Business Development

europe@insightinvestment.com +49 69 12014 2650 +44 20 7321 1928 Consultant Relationship Management consultantrelations@insightinvestment.com +44 20 7321 1023

company/insight-investment

www.insightinvestment.com

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