

Factor credit strategies Enabling insurers to achieve capital- efficient returns

- Factors enable long-term performance, cost efficiency and diversification
- Factor strategies can easily integrate insurance capital requirements
- Client case study highlights attractive return on capital of factor portfolios

The majority of assets owned by insurers are invested in investment grade fixed income. These investments are typically managed using fundamental research-based approaches. In search of a way to achieve more capital-efficient returns, diversification and illiquidity premiums, insurers often turn to high yield markets and alternative asset classes. In this article, we introduce the concept of factor investing in corporate bonds as an attractive alternative approach to generating capital-efficient returns. Furthermore, the systematic nature of a factor-based investment process also provides diversification benefits relative to more conventional processes. We demonstrate how insurance capital requirements can be integrated into factor strategies to increase the return on capital, by lowering the required capital and largely preserving the return.

Factor investing in corporate bonds

Factor investing is a rules- and evidence-based investment approach that analyzes the characteristics or 'factors' of individual securities to construct portfolios. Numerous academic studies¹ on various asset classes, including stocks and bonds, have shown that factor portfolios deliver superior risk-adjusted returns over a full investment cycle, compared to a portfolio that passively

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¹ These include various studies by Robeco authors, see for example Blitz, 2012, 'Strategic Allocation to Premiums in the Equity Market', Journal of Index Investing; Houweling & Van Zundert, 2017, 'Factor Investing in the Corporate Bond Market', Financial Analysts Journal; Baltussen, Swinkels & Van Vliet, 2018, 'Global Factor Premiums'.

tracks the market index. And other studies have shown that the outperformance of actively managed funds can to a large extent be explained by their exposures to factors.²

Over the last two decades, Robeco has dedicated considerable resources to identifying, understanding, improving and implementing factors in credit markets. We documented the existence of factor premiums in our academic paper 'Factor Investing in the Corporate Bond Market', which was published in the *Financial Analysts Journal* in 2017 and for which we received a Graham and Dodd Scroll Award of Excellence.³



In 2018, we were recognized by the CFA Institute with a Graham and Dodd Scroll Award of Excellence for our article 'Factor Investing in the Corporate Bond Market'

Benefits of factor strategies

Insurance companies commonly take a fundamental research-based approach to managing their credit allocations. For them, factor investing provides diversification benefits. As Figure 1 shows, the realized returns of our factor strategies are negatively correlated with those of their fundamental peers. Meanwhile, the realized returns of fundamental strategies are positively correlated. Adding a factor strategy to a portfolio of fundamental strategies therefore strongly improves diversification. The differences between both approaches in terms of the investment process and investment universe illustrate this very clearly.

In terms of the investment process, a multi-factor strategy uses a highly systematic method to construct the portfolio, taking into account multiple quantitative factors and neutralizing the portfolio's exposures in terms of interest rate duration and credit beta. Meanwhile, fundamental strategies typically follow only one style, often carry or value, and regularly take duration and/or beta bets.

In terms of the investment universe, a factor-based strategy can efficiently invest in all companies and bonds, irrespective of their size. Fundamental managers inevitably have to focus on a smaller subset, given their limited resources for analyzing issuers. Generally, this subset consists of the larger, more liquid names and their more recently issued bonds. To illustrate this gap, we compared the holdings of Robeco's actively managed fundamental credit strategy to those of Robeco's factor-based strategy, that both use the same global credit index as a benchmark. At the end of 2018, there was less than 15% overlap between the two portfolios in terms of issuers. This shows how a factor strategy, through a rules-based, data-driven investment process, is able to analyze the entire investment universe, as opposed to the smaller number of issuers that a fundamental manager could handle.

In addition to this, we investigated more thoroughly the style diversification benefits mentioned above by calculating the outperformance correlation between our global multi-factor credit strategy and its fundamental peers. We did the same analysis for our global multi-factor high yield strategy and its peers.⁴ The results are shown in Figure 1.

Clearly, Robeco's multi-factor funds have the lowest (even negative) average outperformance correlations with the other funds, in their respective peer groups. Robeco QI Global Multi-Factor Credits has an average correlation of -19%, whereas the average correlation across all funds in its peer group is +34%. For Robeco QI Global Multi-Factor High Yield, this figure is -13% versus an average of +23% for the group as a whole. So, indeed, our multi-factor funds are strong diversifiers compared to fundamentally-managed funds.

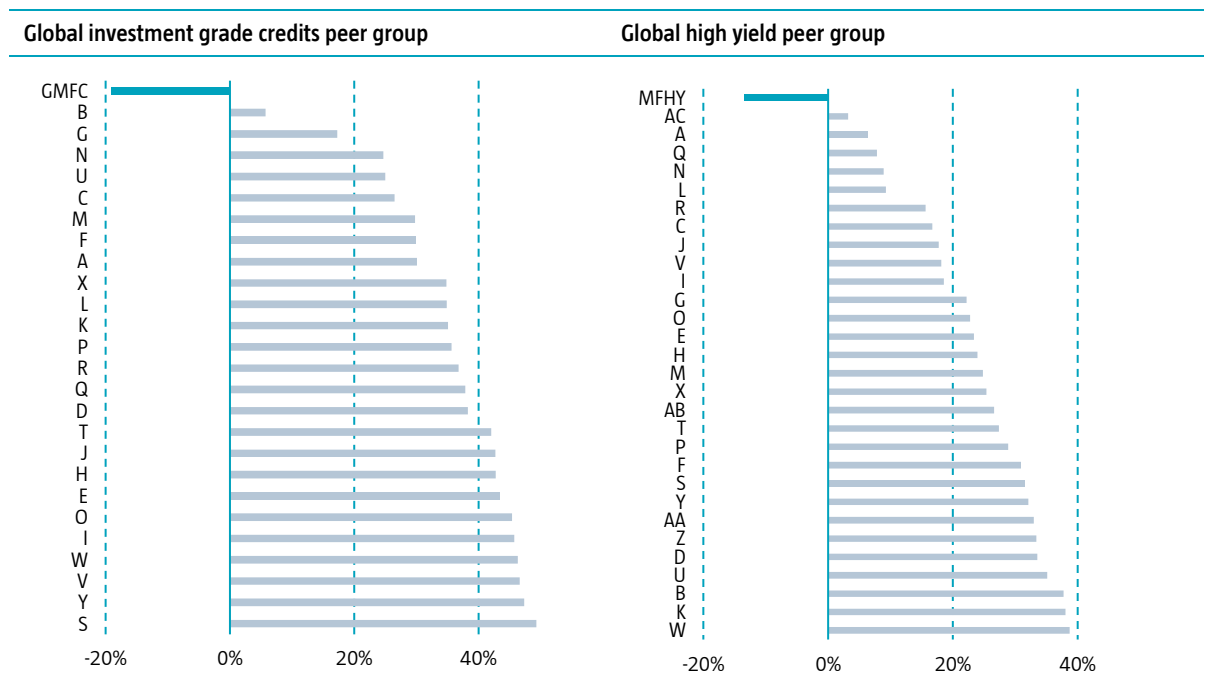
Besides adding diversification to a multi-manager portfolio of traditional credit strategies, factor-based strategies have additional benefits. One positive attribute is the management fee, which is typically lower than that of traditional active credit products. Furthermore, factor products are an attractive option for investors currently invested in passive products, as they offer higher returns, while also using a rules-based and transparent investment process with modest turnover.

² See e.g. Carhart, 1997, 'On Persistence in Mutual Fund Performance' on equity funds and Israel, Palhares & Richardson, 2018, 'Common Factors in Corporate Bond Returns' on credit funds.

³ The full article can be downloaded from the [FAJ website](#).

⁴ Read more about these peer group analyses in our white paper 'Factor credit funds are strong style diversifiers', 2018

Figure 1 | Average outperformance correlations within the peer groups of Robeco's multi-factor funds



Source: Morningstar Direct, Barclays, Robeco. Period: July 2015-June 2018. Left panel: GMFC = Robeco QI Global Multi-Factor Credits. A to Y are 25 anonymized global credit funds. Outperformance is calculated vs. Bloomberg Barclays Global Aggregate Corporates. Right panel: MFHY = Robeco QI Global Multi-Factor High Yield based on backtested results. A to AC are 29 anonymized global high yield funds. Outperformance is calculated vs. ICE BAML Global High Yield index.

The factors used and why they work

Numerous empirical studies, including Robeco's own research, have shown that factor portfolios generate higher returns and higher risk-adjusted returns than the market. However, it is also important to understand the underlying reasons for their historical performance and to be confident that the related premiums will persist. There are commonly accepted explanations that help understand why the factor premiums used in the Robeco factor strategies exist.

- The **low-risk** factor targets safe bonds issued by 'boring' companies. Empirical research shows that they produce returns that are just as high as those generated by the risky bonds of 'exciting' firms, but with lower volatility. Investors tend to overpay for high-risk bonds for a variety of reasons. This can be due to excessive confidence in their ability to select the winners, because they pay too much attention to companies that are in the news, or because they trust the textbook assumption that taking more risk will deliver higher returns.⁵
- The **quality** factor favors companies that are profitable, generate cash flow and are conservatively managed. Research shows that the bonds of high-quality firms outperform those of low-quality firms. This tendency can be attributed to misguided investors, who focus too closely on other indicators of business performance, such as earnings, even though these are less reliable. This often leads to the mispricing of stocks and bonds of high-quality firms.⁶
- **Value** investing involves looking for bonds that are cheap relative to the level of associated risk. Such mispricing may be caused by a short-term overreaction to news, in particular bad news. Research shows that bonds that are undervalued tend to outperform the market. 'Cheap' bonds offer ample credit spread compensation for the risk they carry, while 'expensive' bonds do not.⁷

⁵ Read more about the low-risk factor in our white paper 'The Low-Risk Anomaly in Credits', 2012.

⁶ Read more about the quality factor in our white paper 'The Quality of Low-Risk Credits', 2016.

⁷ Read more about the value factor in our white paper 'Smart Credit Investing: The Value factor', 2016.

- **Momentum** is based on the empirical finding that past returns tend to be indicative of future returns. A company that has done well in the past is likely to continue to do so in the future. A momentum strategy will favor recent 'winners' rather than recent 'losers'. The momentum effect can be the result of herding behavior on the part of investors. It can also be attributed to an underreaction to news report, which leads to slow incorporation of new information in security prices.⁸
- The **size** factor targets smaller companies. These tend to be under-researched because it is impossible for resource-constrained fundamental investors to cover all companies. They therefore focus on larger companies for which more news, data, and bond issues are available. Smaller companies also tend to have smaller bond issues, so the size factor also offers access to an illiquidity premium. Research shows that bonds of smaller firms tend to outperform those of larger firms.⁹

The 'Factor Investing in the Corporate Bond Market' article, already mentioned in this note, shows that these factors deliver higher returns and higher risk-adjusted returns than the market. But it also shows that there is a low correlation between their outperformances.¹⁰ A multi-factor portfolio thus benefits from diversification across the individual factors.

From academic research to practical implementation

Robeco's multi-factor credit strategies offer exposure to the low-risk, quality, value, momentum and size factors. The strategies apply enhanced definitions for each factor. Compared to more generic factor definitions, such as those typically used in academic research, these enhanced definitions lead to higher risk-adjusted returns.¹¹ We assign factor scores to each bond in the universe and these individual factor scores are combined to arrive at a total multi-factor score, so that the resulting portfolio has balanced exposure to all factors.

This multi-factor model lies at the heart of our factor strategies. It determines which bonds and companies can be considered for the portfolio. Before any bond is actually purchased, our team of experienced fundamental credit analysts performs a final check to identify additional risks beyond those identified by the model. For example, if a company announces an acquisition, its capital structure and creditworthiness may materially change, but this will not immediately be reflected in its accounting data. Another example would be a lawsuit filed against a company, or a potential regulatory fine, which may have a substantial impact on its cash flow. Such risks are difficult to assess quantitatively.

Corporate bonds are relatively illiquid. They trade infrequently and tend to have relatively high transaction costs. Moreover, because corporate bonds are traded over the counter, information about transactions is fragmented. To ensure our factor credit strategies are executed prudently and efficiently, liquidity management forms an integral part of the investment process. We systematically scan the market for opportunities, in order to trade bonds that are relatively liquid and have relatively low transaction costs. This enables us to manage our portfolios cost-efficiently while maintaining optimal exposures to factors.¹² For example, in 2018 we were able to trade 15% below the average market costs.

In addition to managing our flagship strategies, Robeco has ample experience with customizing portfolios to the specific needs of our clients.¹³ For example, we can apply the strategy to a specific investment universe, in terms of ratings (e.g. investment grade or high yield), currencies (e.g. euro-only or dollar-only, instead of global), maturities (e.g. only short-dated bonds or only long-dated bonds, instead of all bonds), and sectors (e.g. excluding financials or tobacco companies). Another possible dimension of customization is the integration of sustainability criteria. We can enhance the portfolio's ESG score versus the benchmark, or reduce its environmental impact. Notably, we can customize a factor strategy to the needs of our insurance clients, which can involve the incorporation of capital considerations. This will be discussed in the remainder of this article.

⁸ Read more about the momentum factor in our white paper 'Smart Credit Investing: Residual Equity Momentum', 2013.

⁹ Read more about the size factor in our white paper 'Smart Credit Investing: The Size Premium', 2013.

¹⁰ The exception is the correlation between low risk and quality: these are empirically too similar to be considered two distinct factors, which is why we combine them in a single low-risk/quality factor.

¹¹ Read more about generic and enhanced factors in our white paper 'Factor investing in investment grade & high yield corporate bonds: an overview', 2018.

¹² Read more about our integrated liquidity management in our white paper 'Implementing factor strategies in the corporate bond market', 2016.

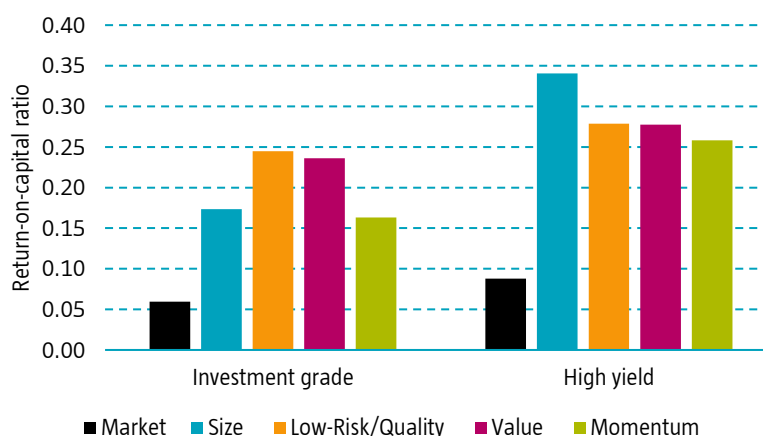
¹³ Read more about customization and specific client cases in our booklet 'Factor investing in corporate bonds: Client case studies', 2018.

Factor portfolios deliver an attractive return on capital

We now demonstrate how factor credit strategies can be beneficial for investors in an insurance capital framework. We use the Solvency II regulatory framework as an example, but we can also work with other frameworks, including insurers' internal capital models. The Solvency II Capital Requirement (SCR) for a corporate bond depends on its rating and duration. In our research, we found a strong positive correlation between the SCR and credit volatility.¹⁴ Therefore, a factor portfolio not only generates a higher return to volatility ratio (i.e. Sharpe ratio) than the market, but also a higher return to capital ratio.

We calculated the return on capital¹⁵ for each factor over the 1994-2018 period. A factor portfolio consisting of the best 10% of the bonds according to each factor. These factor portfolios are constructed separately for the global investment grade and global high yield universes. The results were that size, value, and momentum portfolios had higher returns with similar SCRs, while the low-risk/quality portfolio generated market-like returns with lower SCRs. Figure 2 illustrates this. It plots the return on capital of each factor portfolio and of the market index: all factors generated a higher return on capital than the market. By tilting a portfolio towards bonds that score well with regard to factors, and avoiding bonds that have poor factor scores, investors can construct a portfolio that generates a higher return on capital than a portfolio that passively tracks the market.

Figure 2 | Return-on-capital ratio for top decile factor portfolios



Source: Robeco, Bloomberg Barclays. USD+EUR-denominated corporate bonds, 1994-2018. Decile portfolios constructed by equally weighting top-ranked bonds and holding them for 12 months.

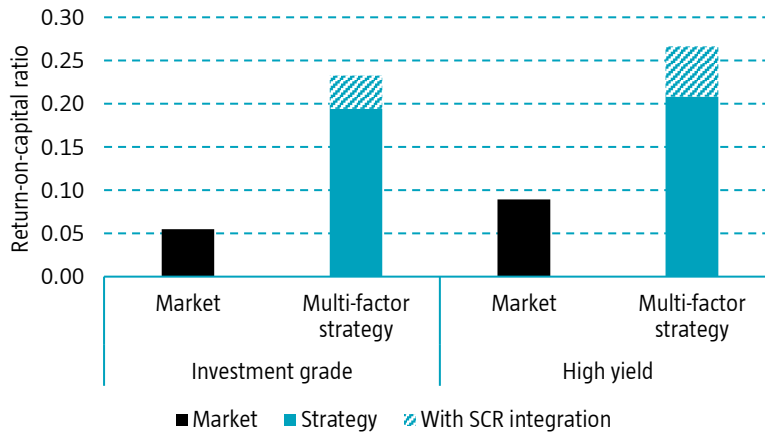
Although the results in Figure 2 show that factors are useful building blocks for constructing portfolios, they do not constitute a realistic investment strategy. In our analysis, we assumed perfect liquidity and zero transaction costs for each bond. We also used a fixed investment horizon, and could have ended up with concentrated positions in specific issuers, sectors, or regions.

Our multi-factor credits and multi-factor high yield strategies explicitly take liquidity, transaction costs and turnover into account, and construct well-diversified portfolios. They therefore offer more realistic expectations for attainable improvements in the return-on-capital ratio. The solid bars in Figure 3 show the net return on capital for these strategies, based on conservative estimates of transaction costs. Both in the investment grade and the high yield universe, a multi-factor strategy delivers a substantially higher return on capital than the market, mainly by generating higher returns with a market-like SCR.

¹⁴ See our white paper 'The impact of Solvency II on investing in corporate bonds', 2012.

¹⁵ The return is calculated as the annualized average credit spread return over all months in the research period; likewise, the capital is calculated as the average of the credit risk SCR in each month.

Figure 3 | Return-on-capital ratios of Robeco’s Multi-factor Credits and High Yield strategies vs the market, with and without SCR integration



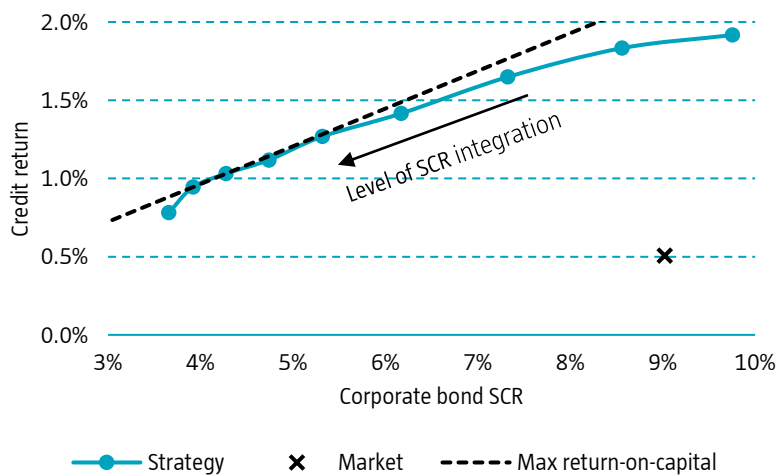
Source: Robeco, Bloomberg Barclays. USD+EUR-denominated corporate bonds, 1994-2018. Past performance is no guarantee of the future.

Explicit integration of SCR improves return on capital

Because factor investing strategies are rules based, they can easily incorporate additional quantifiable objectives, such as the SCR. As mentioned earlier, credit volatility and SCR are highly but not perfectly correlated, which leaves some room for improvement of the return on capital beyond the return on volatility. Figure 3 above shows the added value of integrating SCR into our multi-factor strategies. The striped bars show the additional return on capital that can be obtained by explicitly incorporating the SCR into the multi-factor bond selection model.

For a more detailed explanation, we explore the effects of incorporating the SCR into the multi-factor model in Figure 4. The points furthest to the right show our flagship Robeco Multi-Factor Credits strategy without SCR integration. By incorporating SCR, we are in fact penalizing bonds that require more insurance capital. This leads to a reduction in the SCR of the portfolio. Actually, the SCR can be more than halved, reducing it from almost 10% in our standard portfolio to just below 4%.

Figure 4 | Impact of integrating the SCR in investment grade multi-factor strategies on SCR, return, and return on capital



Source: Robeco, Bloomberg Barclays. USD+EUR-denominated investment grade corporate bonds, 1994-2018. Past performance is no guarantee of the future.

As we move to the left in the chart, we gradually increase the importance of the SCR in the bond selection process. This results in a higher return on capital as the portfolio moves closer to the dashed optimal return on capital line, but also in a lower credit return. The first steps deliver a significant increase in the return on capital, as the SCR of the portfolio is

substantially reduced while credit returns decline only modestly. Portfolios that integrate the SCR also have a lower credit volatility and beta, and a higher Sharpe ratio. We see that they also have lower durations and a higher average credit rating.

At a certain point, giving more weight to the SCR leads to a portfolio that consists predominantly of low-SCR bonds. This reduces the portfolio's exposure to our factors and causes a disproportionately large decline in credit returns (i.e. the points furthest to the left). The optimal level of SCR integration is highly dependent on the specific goals and guidelines of the investor. It depends on the level of risk the investor is willing to take, the corresponding amount of insurance capital and the desired level of credit returns. We have demonstrated that by incorporating the SCR into the multi-factor model, we can efficiently improve the return-on-capital ratio and flexibly tailor a portfolio to match the desired risk and return profile.

Client case study

To illustrate the practical relevance of the integration of insurance capital requirements in factor credit strategies, we focus on a specific client case. The client, a large and sophisticated European asset owner, asked us to design and implement a factor strategy that would deliver an optimal return on Solvency II capital.

The client was interested in our multi-factor high yield strategy, but asked us to look at it from a return-on-capital angle, rather than our traditional Sharpe ratio angle. In 2018 we conducted a collaborative research project with the client. We first looked at our flagship multi-factor high yield strategy and found that it had already delivered a significantly higher return on capital than the benchmark over the backtesting period (1994-2017): 19% versus 8%. This is the result of the high correlation between credit volatility and the SCR, so that Sharpe ratio-optimized factor strategies already deliver an attractive return on solvency capital.

The final step in the project was to explicitly incorporate the SCR into the multi-factor strategy. This means that the SCR-integrated strategy selects bonds that not only have more attractive factor exposures than the average bond in the benchmark, but also have lower SCRs. By increasing or reducing the importance of the SCR in the bond selection process, the client was able to choose whether to optimize the SCR, the return or the return on capital.

Ultimately, we were able to design a portfolio that aims to generate a higher return than the client's selected high yield index for around 60% of the capital requirement, providing significant savings in terms of insurance capital. This bespoke multi-factor high yield strategy was implemented in late 2018.

Conclusions

Insurance companies are significant investors in credits and hold capital buffers to protect their portfolios against negative events. Insurers are also always looking for the best way to diversify their investments and to enhance their return on insurance capital.

In this article, we introduced factor-based strategies as an attractive alternative to traditional, fundamental, research-based strategies for insurers. Their differentiated investment style and their ability to utilize a broader investment universe explain why factor strategies provide an important source of diversification relative to the fundamentally managed portfolios of insurers. Importantly, by systematically harvesting factor premiums, factor strategies can be expected to deliver a higher return on capital than passive credit portfolios. We also showed how we can explicitly integrate insurance capital requirements into factor credit strategies to further enhance the return on capital.

Our factor approaches provide a cost-efficient building block for insurers. The strategies can also be tailored to address specific requirements, for example when insurers wish to match a liability cashflow stream or aim for a certain level of income from a low-turnover buy-and-maintain credit portfolio.

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Robeco is subject to limited regulation in the UK by the Financial Conduct Authority. Details about the extent of our regulation by the Financial Conduct Authority are available from us on request.

Additional Information for investors with residence or seat in Uruguay

The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except in circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated September 27, 1996, as amended.

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The RobecoSAM collective investment schemes ("RobecoSAM Funds") in scope are sub-Funds under the Undertakings for Collective Investment in Transferable Securities (UCITS) of MULTIPARTNER SICAV, managed by GAM (Luxembourg) S.A., ("Multipartner"). Multipartner SICAV is incorporated as a Société d'Investissement à Capital Variable which is governed by Luxembourg law. The custodian is State Street Bank Luxembourg S.C.A., 49, Avenue J. F. Kennedy, L-1855 Luxembourg. The prospectus, the Key Investor Information Documents (KIIDs), the articles of association, the annual and semi-annual reports of the RobecoSAM Funds, as well as the list of the purchases and sales which the RobecoSAM Fund(s) has undertaken during the financial year, may be obtained, on simple request and free of charge, via the website www.robecosam.com or www.funds.gam.com.