ESG Integration

INVESTMENT-LED, EXPERT DRIVEN

July 2020

J.P.Morgan
Asset Management

For more than 150 years, our fiduciary commitment has meant we consider the impact of each decision we make on client portfolios and performance.

John T. Donohue
CEO, Asset Management Americas
Head of Global Liquidity

Jed Laskowitz
Head of Global Asset Management Solutions

Bob Michele
Chief Investment Officer and Head of the Global Fixed Income, Currency & Commodities group

Anton Pil
Global Head of Alternatives

Paul Quinsee
Global Head of Equities

Introduction

At J.P. Morgan Asset Management, we are guided by our fiduciary duty to ensure that the interests of our clients come first as we help them preserve and grow their money. That fiduciary commitment means that we consider the impact of each decision we make on behalf of our clients with their portfolios. We believe that consideration of material environmental, social and governance (ESG) factors should be an important part of the investment process.

It is clear to us that ESG factors will increasingly affect companies' ability to successfully operate and generate returns, today and over the long term.

Today we have access to the greatest data transparency and most advanced analytical capabilities in history. We believe systematically integrating ESG information into our investment process, where material and relevant, will contribute to achieving an enhanced financial return, through better-informed investment decisions and strengthened risk management. ESG integration aimed at achieving sustainable risk-adjusted returns is about using research, insights and data to inform investment decisions.

Integrating ESG into investment decision-making brings about a process that is not very different from how investment decisions have been made historically: looking into the future, factoring in potential risks and opportunities around companies' revenue growth trajectories, and investing accordingly, based on the sustainability of those business models. The difference is that, along with applying traditional financial metrics, we now also access and utilize a set of factors that can help us make even better investments.

The preamble to the United Nations Principles for Responsible Investment (PRI), to which J.P. Morgan Asset Management has been a signatory since 2007, states: "We recognise that applying these Principles [including ESG integration] may better align investors with broader objectives of society."[1] We believe that both investors and businesses have an important part to play in supporting the long-term development of the sustainable economy of the future.

With this paper, I am proud to share with you our approach and commitment to delivering superior value to our clients. Leveraging the expertise of more than 1,000 investment professionals globally, we are building on the foundation of our long-standing fundamental and quantitative research practices to focus strategically on ESG integration. We believe it will help us build stronger portfolios for our clients.

Jennifer Wu
Global Head of Sustainable Investing
J.P. Morgan Asset Management

1 "What are the Principles for Responsible Investment?" PRI website, https://www.unpri.org/pri/an-introduction-to-responsible-investment/what-are-the-principles-for-responsible-investment.

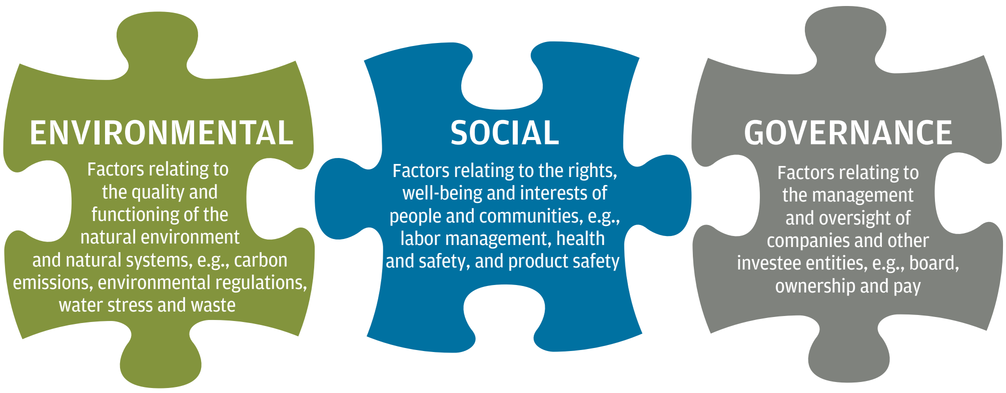
Contents

Our philosophy on integrating environmental, social and governance (ESG) factors into investment decision-making

What is ESG?

Environmental, social and governance factors are a set of metrics—not always systematically reported in the past—that can affect an issuer's performance. We believe that it is valuable to consider how issuers are managing ESG risks and opportunities as part of our investment decisions.

How ESG factors are often described



Environmental	Social	Governance
Carbon emissions	Human rights	Board
Waste management	Diversity	Ownership
Water management	Communities	Remuneration
Biodiversity	Health and safety	Pay
Climate change	Labor management	Accounting
Material sourcing	Employee well-being	

Note: Examples provided for E, S and G are illustrative and not comprehensive.

The evolution of ESG

Information, data and research are key components of investment decision-making, but until recently, consistent, useful datasets on ESG factors were lacking. In many cases, investors had only ad hoc company disclosures and inconsistent industry datasets.

Over the last few years, however, the quantity and quality of ESG-related data available to investors have improved dramatically. Organizations that encourage voluntary disclosure—such as CDP (formerly the Carbon Disclosure Project), the Sustainability Accounting Standards Board (SASB) and the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD)—have played an important role in helping businesses better understand, measure and communicate to investors the ESG risks they are exposed to. Investors can now access higher quality ESG-related data that is more consistent, comparable and reliable. Clear new regulations, such as those in the UK set to make disclosures mandatory, have also helped accelerate the availability of data.[2] Companies' wide adoption of ESG disclosure has been dramatic: In 2004, just 300 companies (most of them based in Europe) reported their annual greenhouse gas (GHG) emissions data to CDP. Now more than 8,000 companies around the world do so. In 2011, just 20% of S&P 500 index companies reported on sustainability. Today 85% do.[3]

The growth of digitization has unlocked many new possibilities for collecting and processing enormous sets of data. Some of this newly available data helps us evaluate ESG factors' effects on long-term cash flows. We can also harvest information from unconventional, alternative data sources, utilizing recently available technologies, including artificial intelligence, machine learning and natural language processing, to discover relevant insights.

With access to more ESG data and better analytical capabilities than ever before, we believe we can now evaluate the companies and assets in which we invest in smarter, more holistic ways. The term for our approach is ESG integration: using financially material ESG factors to generate enhanced risk-adjusted returns.

The evolution in how we consider ESG factors in investing

Through our long history of active management, we have always strived to consider the broad consequences of our investment choices on long-term performance. As such, we have historically considered the material ESG factors that impact companies' and assets' longer-term strategic risks and opportunities as a part of our fundamental research. Formerly, this consideration was focused primarily on governance: issues such as board quality, compensation and shareholder rights. Now we have evolved to incorporate a wider spectrum of ESG issues. We are delving into sustainability strategies, waste management, workers' rights, diversity and much more.

Another aspect of our evolution is our application of ESG factor analysis to all the sectors we cover, and to all regions globally. The broadening adoption of ESG analysis among investors is reflected in the huge growth in signatories to the United Nations Principles for Responsible Investment (PRI), whose mission is, broadly, advancing the integration of ESG into asset owners' and managers' analysis and decision-making. Today the PRI has over 2,300 signatories worldwide, representing over USD 85 trillion in assets under management, up from 63 organizations representing USD 6.5 trillion in 2006.[4]

Given the greater transparency in data and investors' rising awareness about how ESG factors can be applied in investing, we note that ESG factors are used primarily for two objectives. First, financially material ESG factors are used to generate enhanced risk-adjusted returns. This approach is often called ESG integration. At J.P. Morgan Asset Management, we define ESG integration as the systematic inclusion of financially material ESG factors in investment analysis and investment decisions, with the goal of enhancing long-term risk-adjusted financial returns.

Second, for clients with strategies that go beyond ESG integration, a broader range of ESG factors are used to achieve specific sustainability-related outcomes and financial returns, typically by screening or tilting portfolios based on sustainability-related criteria that may or may not be financially material. These are typically classified as "sustainable investment strategies."

2 "The A List 2019," CDP, https://www.cdp.net/en/companies/companies-scores.

3 "Flash Report," Governance & Accountability Institute, May 16, 2019, https://www.ga-institute.com/press-releases/article/flash-report-86-of-sp-500-indexR-companies-publish-sustainability-responsibility-reports-in-20.html.

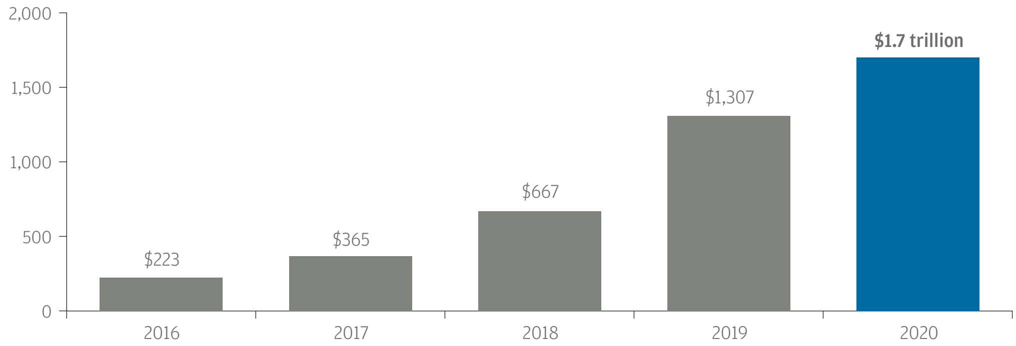
4 PRI, https://www.unpri.org/.

Our approach and commitment to ESG integration

ESG integration serves as a foundation for investment decisions across J.P. Morgan Asset Management.

Since 2016, we have committed to incorporating ESG factors into our investment processes for active strategies across our investing platform, where material and relevant. Our Alternatives, Equities, Global Fixed Income, Currency & Commodities (GFICC), Global Liquidity and Global Asset Management Solutions investment engines have formalised their ESG integration processes for actively managed segregated mandates and funds (**EXHIBIT 1**). For funds, please review the prospectuses to find out whether a fund is ESG integrated.

EXHIBIT 1: GROWTH OF OUR ESG INTEGRATED ASSETS UNDER MANAGEMENT



Source: J.P. Morgan Asset Management; data as of March 31, 2020.

Commit, Implement and Demonstrate

Since 2016, J.P. Morgan Asset Management has followed a structured, three-step process through which investment teams have applied for "ESG integrated" status:

Commit

Investment teams are asked to dedicate resources to ESG integration, appoint ESG champions and set clear ESG integration goals.

Implement

Investment teams incorporate ESG factors into each stage of their investment processes, such as research, portfolio construction and stewardship.

Demonstrate

Investment teams go through a formalized process (detailed below) to document their ESG integration.

J.P. Morgan Asset Management embraces a number of different investment methodologies and approaches. Some strategies collect and deploy ESG data in a highly systematic way to produce rankings used in security selection and portfolio construction. Other strategies use data more qualitatively, through fundamental research. As a global active manager utilizing a variety of investment styles, we integrate ESG factors into the investment process in a manner consistent with the underlying style, from the purely quantitative to those based on a combination of fundamental research and qualitative judgments. We do not apply a uniform approach to ESG integration. Instead, we focus on the integrity of the process.

Delivering ESG integration: Our 10-point scoring system

The firm has gone through the Commit stage. During the ongoing Implement stage, the J.P. Morgan Asset Management Sustainable Investing team, in partnership with 19 senior portfolio managers, research analysts and investment stewardship specialists across the firm, defines our firmwide approach to ESG integration. We call this group the Sustainable Investment Leadership Team–ESG Data & Research Working Group. The Working Group has developed a 10-point scoring system to evaluate progress toward, and achievement of, ESG integration at each critical step of a typical investment process.

Our coordinated strategy for sustainable investing is driven by Jennifer Wu, Global Head of Sustainable Investing. The Sustainable Investing team is structured as three pillars:

- *The Sustainable Investing Solutions & Product Innovation* pillar partners with our investment and distribution teams to provide expertise in developing a sustainable investing product framework. Building on ESG integration, the team engages with clients on targeted solutions and builds training and marketing tools to help further accelerate the development of our firmwide capabilities.
- *The Sustainable Investing Research & Data* pillar is focused on developing dedicated ESG research by partnering with our investors across asset classes and with data scientists. The priority over the next two years is building our proprietary ESG scores, as well as thematic research and analytics, with a key focus on climate change and carbon transition.
- *The Investment Stewardship* pillar is responsible for our investment-led, expert-driven stewardship approach, engaging with companies and voting proxies on behalf of clients. The five main priorities: governance, strategy alignment for the long term, human capital management, stakeholder engagement and climate risk.

At the Demonstrate stage, the investment teams are required to present to the Working Group the ways they pursued ESG integration. Our process for determining which strategies are ESG integrated has continued to evolve and improve with the development of our system of 10 metrics (**EXHIBIT 2**).[5] To receive ESG integrated status under our current methodology, the investment team must receive an aggregate score of at least 30 points and, for each metric, receive at least a 2 on a scale of 1 to 5. If the strategy does not meet this threshold, the Working Group will discuss specific shortcomings and the improvements that need to be made before it can be reevaluated at a later stage. The 10-metric scoring system not only offers guidance on how to evaluate a particular strategy but also can be used to measure progress over time.

[5] Strategies that were ESG integrated prior to the adoption of the framework were also reviewed according to the 10-point scoring system to affirm their integration.

EXHIBIT 2: J.P. MORGAN ASSET MANAGEMENT 10 POINT METRICS FOR ESG INTEGRATION

		Metrics	Sub Questions
Research & Investment Management	1	**Research analyst/ investment due diligence**	• Is ESG integration is an integral part of the research or investment due diligence process? • Are analysts engaging on issues related to ESG with companies and leveraging ESG information for analysis?
	2	**Consideration at portfolio management/ investment decision level**	• Is ESG fundamental to the investment decision-making process? • Do ESG factors lead to a reweighting of the portfolio? • Do the portfolio managers and/or investment committee override or add insights to analysts' ESG analysis?
	3	**Breadth of third-party ESG data**	• Is independent, external or third-party data incorporated into ESG analysis? How is the data used? • Is the team relying on a single data source, or are different third-party data sources leveraged and used for verification?
	4	**Level of proprietary research conducted**	• How much in-house research has been conducted in conjunction with available third-party data? Is there a heavy reliance on external/third party data? • Is there any evidence of ESG scores created by the team? • Where relevant, does the team meet with companies to engage on issues related to ESG?
	5	**Company/sector coverage**	• Has the team considered sector differences when integrating ESG and thought about the factors' materiality? • If so, how is the team implementing this?
Documentation	6	**Documentation of integration methodology**	• Is there documentation as to how ESG is integrated? • Is there a specific methodology or a framework being leveraged and has this been shared within the team?
	7	**Documentation of proprietary data & research methods**	• Is there any documentation of proprietary data and research? • Are there any case studies/examples that demonstrate this? • Is ongoing corporate engagement part of the process and how is that documented, especially with respect to engagement activities on highlighted material ESG factors?
Monitoring	8	**Risk management and oversight**	• Is there clear assignment of roles and responsibilities in the ESG integration process to ensure risk management and oversight are in place? • What is the risk management process of ESG integration?
	9	**Systemization**	• Is the process implemented using a centralized system such as Spectrum™ so it can be leveraged by the entire investment engine? • Is the ESG integration information shared across the team, not just within a limited group of people?
	10	**Ongoing monitoring and maintenance**	• How does monitoring of ESG integration take place? • Is there a forum to discuss improvements to and enhancements of ESG integration?

Case Study

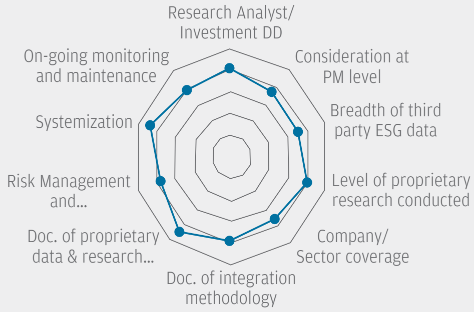
The journey to integration

Original Score: 28

Reason for underwrite: Correct approach and systemization in place, however needed to demonstrate that ESG integration had been implemented.

Results from WG vetting: 19/03/2020

ESG Integration - Results



New Score: 39

Key strengths: Strong ESG consideration at research/due diligence level, strong documentation and systematization.

Next steps: None near term, but can continue to implement data enhancements.

Integration is a rigorous process, and the Sustainable Investing team works with investment desks to ensure they meet the required standards.

In this example, the investment strategy initially scored 28 on its ESG demonstration assessment, not meeting the minimum 30-point score to be classified as an ESG integrated strategy.

Reasons for the score

The Working Group gave credit to the approach and the systemization, which were integrated into the team's centralized investment systems.

However, the Working Group found some limitations in other aspects of the ESG integration process—for example, in applying ESG consideration to a wider range of company and sector coverage.

Actions taken

The Working Group recommended the team expand its ESG research coverage before coming back for a second review of its ESG integration standards.

Approved as ESG integrated

The investment strategy was approved on second review after the team demonstrated changes to the way it was addressing the areas requiring deeper ESG consideration.

We require all ESG integrated teams to continue incorporating ESG factors in a meaningful, day-to-day and consistent way. We are developing a consistent monitoring process to make sure that investment teams are continuing to incorporate the consideration of material ESG factors into their ESG integrated strategies, as part of their existing, regular investment review system. For example, the Investment Director teams in Equity, Global Fixed Income Currency & Commodities (GFICC) and Multi-Assets Solutions (Solutions) are in charge of performance and risk oversight of portfolio management to maintain discipline around investment objectives and process. Historically, they have included some monitoring of ESG; however, this responsibility has now been formalized. The Investment Director teams will be conducting formal quarterly reviews of each investment strategy in the context of client objectives, performance, risk positioning and ESG integration.

Third-party assessment of our approach

The United Nations Principles for Responsible Investment initiative is an international effort promoting the incorporation of ESG factors into investment decision-making.[6] Its signatories currently have approximately USD 90 trillion in assets under management worldwide. J.P. Morgan Asset Management has been a PRI signatory since 2007. As a signatory, we are committed to the following PRI principles:

1. Incorporate ESG issues into investment analysis and decision-making processes.
2. Be active owners and incorporate ESG issues into our ownership policies and practices.
3. Seek appropriate disclosure on ESG issues by the entities in which we invest.
4. Promote acceptance and implementation of the Principles within the investment industry.
5. Work together to enhance our effectiveness in implementing the Principles.
6. Report on our activities and progress towards implementing the Principles.

PRI assesses asset managers on their approach to responsible investing, including ESG integration, based on the asset managers' annual reporting.

J.P. Morgan Asset Management has scored **A+** on overall Strategy and Governance, higher than the peer median of A (**EXHIBIT 3**).

EXHIBIT 3: J.P. MORGAN ASSET MANAGEMENT PRI ASSESSMENT SCORES, 2019

PRI Assessment Results		JPM 2019	PRI 2019 Median
Strategy and Governance		A+	A
Equity	Listed Equity (incorporation)	A	B
	Listed Equity (active ownership)	A	B
Fixec Income	Fixed Income - SSA	B	B
	Fixed Income - Corporate Financial	A	B
	Fixed Income - Corporate Non-Financial	A	B
	Fixed Income - Securitized	B	C
Alternatives	Property	A	B
	Infrastructure	A	A
	Private Equity	A	B
	Manager Selection: Private Equity	A	A

Source: PRI, as of August 2019. For J.P. Morgan Asset Management's latest (2019) PRI assessment, please see www.jpmorgan.com/esg.

[6] PRI, https://www.unpri.org/. For full disclosure of our 2019 PRI assessment, visit www.jpmorgan.com/esg.

Why is ESG integration important?

We believe long-term thinking leads to sustainable business models. We know that how companies manage the risks and opportunities that ESG factors encompass has numerous consequences for their business results, sometimes for the worse. ESG factors are likely to influence reputational and regulatory downside risk. But they can also create opportunities for companies—for revenue growth, greater productivity, market access or recruiting and retaining talent.

In many cases, the impact of ESG factors on financial performance can be identified in historical data. In other cases, ESG factors are just starting to affect companies' financial performance. Take a company's greenhouse gas emissions. Until recently, most customers didn't take a company's carbon emissions into account in their purchasing decisions, nor were they seen as a significant source of regulatory risk. But rising awareness of climate change has started to spur a paradigm shift. This demonstrates the importance of moving beyond an approach to ESG based only on backward-looking data to also examine forward-looking factors that are likely to affect a company's future financial performance.

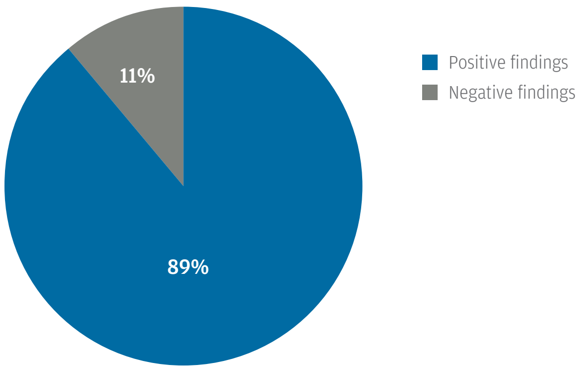
We think of ESG factors as additional inputs that inform better investment decision-making and believe that incorporating these factors into investment processes—ESG integration—may strengthen risk management and contribute to more stable, enhanced financial returns. We believe that ESG integration can help deliver enhanced risk-adjusted returns over the long run.

Academic research: ESG integration improves financial performance

Our view that ESG integration can deliver superior risk-adjusted returns is based on a large and growing body of empirical research.

A meta-analysis of more than 2,000 academic studies by Friede et al. (2015)[7] finds that a large majority of empirical studies identify a positive relationship between ESG factors and companies' financial performance. About 11% of studies identify a negative relationship (EXHIBIT 4).

EXHIBIT 4: MOST STUDIES FIND ESG FACTORS ARE POSITIVELY LINKED TO FINANCIAL PERFORMANCE



Source: Friede et al. (2015).

Ioannou and Serafeim (2019) demonstrate that when market leaders introduce sustainable practices, many eventually spread out to become common practices within an industry.[8] We can conclude that adopting sustainable practices may no longer be just a source of comparative advantage;

7 Gunnar Friede, Timo Busch and Alexander Bassen, "ESG and financial performance: aggregated evidence from more than 2000 empirical studies," Journal of Sustainable Finance & Investment, 5:4 (2015), 210-233, https://www.tandfonline.com/doi/pdf/10.1080/20430795.2015.1118917.

8 Ioannis Ioannou and George Serafeim, "Corporate Sustainability: A Strategy?" Harvard Business School Accounting & Management Unit Working Paper No. 19-065, January 2019, https://www.hbs.edu/faculty/Publication%20Files/19-065_16deb9d6-4461-4d2f-8bbe-2c74b5beffb8.pdf

it may be a necessary action companies must take to keep from falling behind. Other sustainable practices can be used as a source of strategic advantage, differentiating a company from its competitors. Such strategic sustainability choices may significantly improve return on capital.

The impact of ESG factors on companies' fundamentals is also reflected in the total returns that investors can expect to earn.

A growing body of evidence finds that equity funds, for example, that overweight companies with good ESG metrics outperform their benchmarks[9, 10] and this effect has become more pronounced in recent years. Taken together, this body of research suggests not only that ESG factors affect future profitability but that these future benefits are not fully priced in by equity markets.

An ESG overlay can also help bond portfolio construction. Research by J.P. Morgan Asset Management's Global Fixed Income Currency & Commodities (GFICC) team demonstrates that considering material ESG factors in active bond selection strategies can reduce portfolio volatility and, for investment grade bonds, enhance a bond portfolio's risk-adjusted returns (EXHIBIT 5).[11] Research also finds that investing in more sustainable companies can limit fixed income investors' exposure to downside risk without sacrificing expected yields (based on forecasts). Together, these findings suggests that, as in equity markets, the fundamental benefits of sustainable asset management practices are not fully priced in by fixed income investors.

EXHIBIT 5: AN ACTIVE ESG-TILTED BOND STRATEGY LARGELY OUTPERFORMS A RELEVANT CUSTOMIZED ESG SECTOR BENCHMARK

ESG tilted active strategies vs. customized ESG benchmarks gross of typical transaction costs (IG, HY and EM)

	Excess retuns	Volatility	Return-risk ratio	Drawdown
USD IG	Improvement	Improvement	Improvement	No change
EUR IG	Improvement	Slightly higher	Improvement	No change
USD HY	Improvement	Improvement	Improvement	Improvement
EUR HY	No change	No change	No change	No change
USD EM	Improvement	Improvement	Improvement	Improvement

ESG tilted active strategies vs. customized ESG benchmarks net of typical transaction costs (IG, HY and EM)

	Excess retuns	Volatility	Return-risk ratio	Drawdown
USD IG	No change	Improvement	No change	Improvement
EUR IG	Improvement	Improvement	Improvement	Improvement
USD HY	Lower	Improvement	No change	Improvement
EUR HY	Lower	Improvement	Lower	Improvement
USD EM	Lower	Improvement	Improvement	Improvement

Source: USD and EUR ICE Bank of America-Merrill Lynch Global High Yield, Global Corporate and Emerging Markets Corporate Plus indices; MSCI ESG Research; J.P. Morgan Asset Management Global Fixed Income, Currency & Commodities Quantitative Research Group; data as of March 31, 2019. Note: ESG-tilted strategies are all controlled for market sector, rating and duration. EM: emerging market; HY: high yield; IG: investment grade.

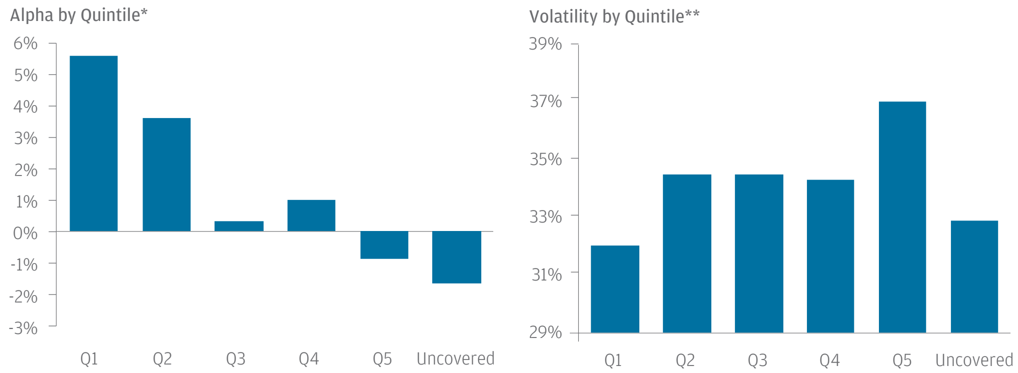
9 Patrick Wang and Madison Sargis, "Better Minus Worse: Evaluating ESG Effects on Risk and Return," Morningstar, February 2020, https://www.morningstar.com/content/dam/marketing/shared/pdfs/Research/963558_better_worse_final.pdf?utm_source=eloqua&utm_medium=email&utm_campaign=&utm_content=20815.

10 Dimitris Melas, Zoltán Nagy and Padmakar Kulkarni, "Factor Investing and ESG Integration," MSCI, November 2016, https://www.msci.com/documents/10199/d13c8a0e-de0e-4313-82e2-0a197af30c34.

11 Bhupinder Bahra and Lovjit Thukral, "Does an ESG tilt improve corporate bond portfolio outcomes?" J.P. Morgan Asset Management, June 2019, https://am.jpmorgan.com/ch/en/asset-management/institutional/insights/portfolio-insights/sustainable-investing/does-an-esg-tilt-improve-corporate-bond-portfolio-outcomes/.

A study by J.P. Morgan Asset Management's Emerging Market Asia Pacific (EMAP) team analyzed the effect of ESG factors on shareholder returns in emerging markets.[12] The team's work demonstrated the importance of looking beyond standard quantitative ESG metrics and developing a deeper understanding of firms' strategies and policies. Our EMAP research analysts regularly engage with companies' management, asking 98 questions about their ESG practices. Over the study's time horizon, companies that scored highly on these 98 questions (top quintile) materially outperformed those scoring in the bottom quintile. Selecting the stocks of companies in the top quintile allowed us to generate higher alpha with lower volatility; investing in the equity of companies in the bottom quintile led to negative returns and higher volatility (EXHIBIT 6).

EXHIBIT 6: OUR PROPRIETARY ESG QUESTIONNAIRE FOR EMAP FOUND HIGH SCORES CORRELATED WITH PERFORMANCE, LOW SCORES WITH VOLATILITY AS THE TOP QUINTILE OF MATERIALLY OUTPERFORMED THE BOTTOM QUINTILE, WITH LESS VOLATILITY



Source: J.P. Morgan Asset Management; Q=quintile. Data as of October 31, 2019. * Time period February 2013 - October 2019. ** Time period October 2013 - October 2019.

[12] Austin Forey, Leon Eidelman, Amit Mehta, John Citron , "Fundamentally speaking: Sustainable investing," J.P. Morgan Asset Management, January 2020, https://am.jpmorgan.com/content/dam/jpm-am-aem/global/en/insights/portfolio-insights/jpm52494_fundamentally_speaking_em_sustainable.pdf.

Specific ESG factors and financial performance

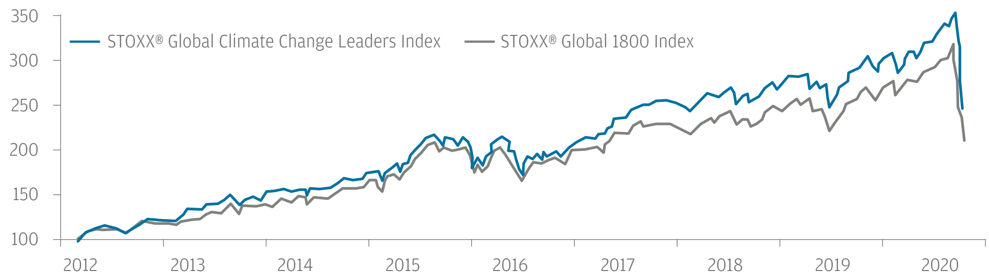
Environmental (E): The financial impact of climate change

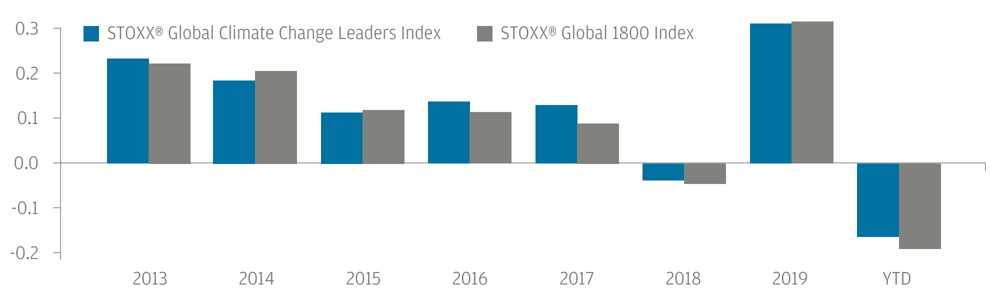
Companies are under ever greater pressure to react to the risks and opportunities brought about by a changing climate. Significant business investments will be required to address climate change. According to CDP, opportunities arising from the transition to a low carbon economy could be worth USD 2.1 trillion globally, while the risk of not making climate-related business changes could cost as much as USD 1 trillion.[13] Companies that effectively manage their climate change exposure can reduce their downside risks, and their actions can play an important role in enhancing revenue generation.

Even more importantly, financial markets are starting to factor in a forward-looking view of the impact of climate change risk on companies' performance. For example, in evaluating automotive companies, investors are asking about their electrification strategies to determine the risks and opportunities they will face as the transition to a low carbon economy gathers pace. Another example is increased evaluation of oil and gas companies' strategies for shifting away from fossil fuels, to avoid the risk of stranded assets in the wave of transition to a low carbon society.

How companies answer these kind of questions is visible in their annual returns. According to data from STOXX (**EXHIBIT 7**), companies given a "climate-friendly" score by CDP have outperformed their global benchmark by an average of 5.5% per year over the last seven years.[14] The data also demonstrates that asset prices are just starting to reflect climate-related factors, coinciding with the increased public focus on climate change.

EXHIBIT 7: CLIMATE CHANGE LEADERS DEMONSTRATE STRONG PERFORMANCE





Source: STOXX Global Climate Change Leaders Index; data as of May 29, 2020.

[13] "World's biggest companies face $1 trillion in climate change risks," CDP, June 2019, https://www.cdp.net/en/articles/media/worlds-biggest-companies-face-1-trillion-in-climate-change-risks.

[14] "Alphabet, Citigroup and Walmart named among global leaders on corporate climate action in CDP climate A List," CDP, January 2020, https://www.cdp.net/en/articles/media/alphabet-citigroup-and-walmart-named-among-global-leaders-on-corporate-climate-action-in-cdp-climate-a-list.

Climate risk is a key consideration for asset classes and strategies such as infrastructure and real estate. Their investments are susceptible to the consequences of potentially faster-than-expected shifts in climate, including rising temperatures, higher sea levels and more extreme weather events, which may affect revenues. These risks may, in some cases, lead to opportunities (e.g., increased deployment of private capital to build the infrastructure to protect against rising sea levels). More focus on climate change could push valuation multiples higher for renewable power-related assets and other carbon-neutral investments.

Social (S): The impact of human capital management and diversity

The impact of human capital management on financial performance
How a company manages its human capital resources—its people—is a vital component of corporate strategy, at least in part because it can have a material impact on financials. The academic consensus holds that better human capital management leads to better company performance. One comprehensive study looked at 92 studies that assessed the effect of training and HR policies on financial outcomes: total shareholder return, return on assets, return on earnings, return on investment, return on capital employed and profitability.[15] Of the 92 studies, 73 concluded that there are positive correlations between human capital management and investment outcomes. A widely cited 2011 study also demonstrated a significant and positive relationship between employee satisfaction and long-run stock returns.[16] Taken together, these studies suggest that employee satisfaction can boost companies' future profitability. And our own analysis implies that these future benefits are not fully reflected in equity prices today.

The impact of diversity on financial performance
An abundance of evidence documents the correlation between a diverse and inclusive workforce and additional profitability. In 2020, McKinsey & Company research found that companies ranked in the top quartile for their executive teams' gender diversity were 25% more likely to have above-average profitability than companies in the bottom quartile.[17] The same research found the bottom-line benefits of ethnic and cultural diversity on executive teams equally convincing: The profitability of companies in the top quartile for diversity was 36% higher than that of those in the bottom quartile (EXHIBIT 8). Another study, by Boston Consulting Group (BCG), suggests that increasing the diversity of leadership teams' gender, age, nation of origin, career path, industry background and education leads to more and better innovation as well as improved financial performance. BCG found that in both emerging and developed economies, companies with more diverse leadership reported a greater payoff from innovation and higher EBIT margins.[18]

Other research has found, however, that as important as diversity is at the executive level, it's not enough. To build a resilient business, companies need diversity across the workforce generally.

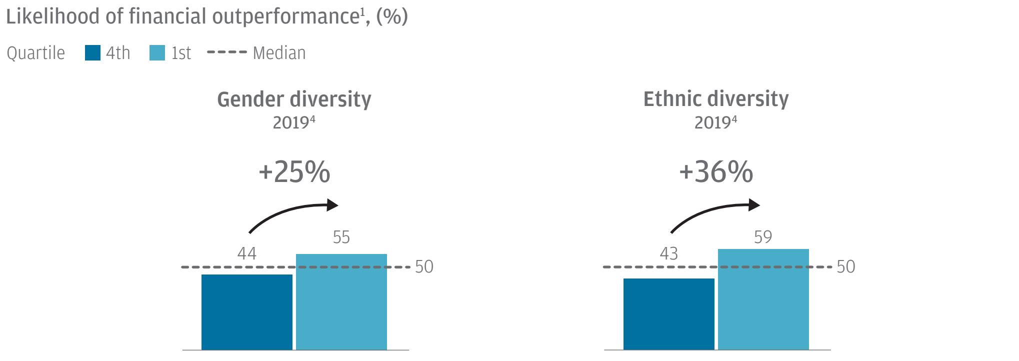
[15] Aaron Bernstein and Larry Beeferman, "The Materiality of Human Capital to Corporate Financial Performance," Investor Responsibility Research Center Institute, April 2015, https://lwp.law.harvard.edu/files/lwp/files/final_human_capital_materiality_april_23_2015.pdf.

[16] Alex Edmans, "Does the stock market fully value intangibles? Employee satisfaction and equity prices," Journal of Financial Economics 101 (2011), 621–640, http://faculty.london.edu/aedmans/Rowe.pdf.

[17] Vivian Hunt, Sara Prince, Sundiatu Dixon-Fyle and Kevin Dolan, "Diversity wins: How inclusion matters," McKinsey & Company, May 2020, https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Diversity%20and%20Inclusion/Diversity%20wins%20How%20inclusion%20matters/Diversity-wins-How-inclusion-matters-vF.pdf.

[18] Rocío Lorenzo, Nicole Voigt, Miki Tsusaka, Matt Krentz and Katie Abouzahr, "How Diverse Leadership Teams Boost Innovation," Boston Consulting Group, January 2018, https://www.bcg.com/en-us/publications/2018/how-diverse-leadership-teams-boost-innovation.aspx.

EXHIBIT 8: IN ONE STUDY, COMPANIES WITH THE BEST (TOP QUARTILE) GENDER AND ETHNIC DIVERSITY MATERIALLY OUTPERFORM THOSE IN THE BOTTOM QUARTILE



Source: McKinsey and Company; study data as of May 2020.

When it comes to appropriately measuring social factors' materiality, we understand the importance of incorporating cultural and contextual differences. For example, how an ESG analysis considers the different elements within the diversity agenda—such as ethnicity, gender and social background, among others—differs from market to market.

Governance (G): The impact of enhanced oversight

There is strong evidence that well-governed companies tend to outperform those with weak governance. Good governance can enhance oversight and reduce downside risks, as well as increase operational efficiency, by ensuring financial resources and real assets are used effectively.

One study nearly 20 years ago showed that shares of companies with better shareholder protections through stronger governance significantly outperformed shares of less well-governed companies. An asset management strategy of buying shares of firms ranked in the top decile for corporate governance and selling firms in the bottom decile would have earned excess returns of over 8% per year.[19] These effects seem to have endured over the two decades since the first prominent studies on the issue. In 2019, Grant Thornton found that companies with strong governance generate 3.4 times more cash flow from their operations.[20] Yet, even years after the importance of good corporate governance was established, this factor still does not seem to be fully reflected in equity prices.

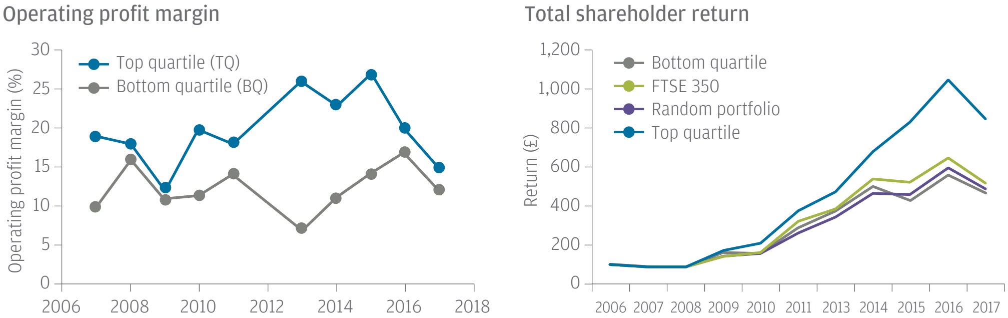
The Grant Thornton study also illustrates the importance of investors working with firms to help them improve their governance. On average, companies that improve their governance enough to move their score to the next-higher quartile go on to generate 44% more operating cash flow—increasing free cash flow by 46% and EBIT margins by 10%, on average (**EXHIBIT 9**).

Between 2008 and 2017, the total shareholder return for companies with strong corporate governance was twice as high as the return for companies with poor governance.

[19] Paul Gompers, Joy Ishii and Andrew Metrick, "Corporate Governance and Equity Prices," Quarterly Journal of Economics 118: 1 (2003), 107-155, https://www.jstor.org/stable/25053900?seq=1.

[20] Sarah Bell, "Corporate governance and company performance: A proven link between effective corporate governance and value creation," Grant Thornton, 2019, https://www.grantthornton.co.uk/globalassets/1.-member-firms/united-kingdom/pdf/documents/corporate-governance-and-company-performance.pdf.

EXHIBIT 9: COMPANIES THAT IMPROVE THEIR GOVERNANCE SCORE GENERATE MORE OPERATING CASH FLOW AND IMPROVE SHAREHOLDER RETURNS



Does TQ outperform BQ?	Yes
Outperformance probability	100%
TQ avg outperformance	+43%
Correlation coefficient	0.179

	Sharpe ratio	Standard deviation
Top quartile	11.6	179.51
FTSE 350	9.6	173.71
Random portfolio	10.9	164.92
Bottom quartile	9.8	163.01

Sectors conforming to trend

- Basic materials
- Consumer goods
- Consumer services
- Financial services
- Healthcare
- Industrials
- Telecoms
- Technology
- Oil and gas
- Utilities

Source: Grant Thornton; data as of 2019.

Assuming that the same governance arrangements are effective for all firms, however, may understate the benefits of *appropriate* governance. For example, recent research has summarized the potential role that governance plays in promoting or impeding "corporate agility." Agility here refers to the speed with which firms adapt, in different ways, to changes in their environments.[21]

ESG integration and the regulatory landscape

Since the passage of a series of global ESG initiatives and the adoption of targets such as the Paris Agreement,[22] governments and regulators have been looking to enact regulations. Several such ESG regulations are in the consultation phase or have passed in some jurisdictions, including the European Union's action plan on sustainable finance.[23] J.P. Morgan Asset Management is working internally, as well as engaging with local regulators and industry bodies across regions, to assess the impact of these regulations and to ensure that we meet all requirements (for example, with our product classifications and disclosures). Where these regulations impact our ESG integrated products, we will provide additional information, including any required disclosures.

[21] Kenneth Lehn, "Corporate Governance and Corporate Agility," Harvard Law School Forum on Corporate Governance, December 2019, https://corpgov.law.harvard.edu/2019/12/11/corporate-governance-and-corporate-agility/.

[22] The Paris Agreement brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so.

[23] The action plan on sustainable finance adopted by the European Commission in March 2018 has three main objectives: to reorient capital flows towards sustainable investment, in order to achieve sustainable and inclusive growth; to manage financial risks stemming from climate change, environmental degradation and social issues; and to foster transparency and long-termism in financial and economic activity.

Approach by asset class

Equities

We believe that responsible stewardship of our clients' assets requires an assessment of the ESG risks and opportunities of the companies in which we invest. We address ESG factors throughout our investment process, including research, company engagement and portfolio construction. Our fundamental analysts incorporate ESG considerations into their analysis to gauge the sustainability of a business, the quality of management and the risks posed to minority shareholders.

Research

A key strength of our investment process is our in-house research capabilities, on both a fundamental and a quantitative basis. Our ESG views of specific companies, part of the foundation of our fundamental research approach, are the product of proprietary research and one-on-one engagement with companies. In addition, we draw on data from external providers.

We used several internally developed research processes to assess the ESG credentials of any business:

1. A globally consistent, 40-question ESG checklist, which has been answered for more than 2,000 stocks globally, has produced a unique proprietary database of ESG factors across our investible universe.
2. A quantitative-led ESG score leverages third-party ESG data, weighted according to our own views on materiality. This score provides further breadth for stocks not currently covered by our 40-question checklist.
3. A strategic classification framework for the 2,000-plus stocks that we cover. These classifications provide a rating (Premium, Quality, Trading and Structurally Challenged) for each stock, based on our judgment of the quality of the business; ESG is an explicit part of the rating process.
4. Deep-dive research into specific ESG topics identified as material to our investment process, for stocks and sectors. Among the topics examined: flaring in U.S. oil fields, the environmental impact of fast fashion in Europe and corporate governance in insurance companies in Asia.

As we continue to develop and refine our ESG analysis, we are looking to build a proprietary materiality framework. The twin objectives of this framework: to deepen our insights, including our views on which subindustries are more (or less) attractive from an ESG perspective; and to systematically identify best-in-class businesses at a more granular level. We have recently finalized this framework in our Emerging Markets Asia Pacific team.

Engagement

Active engagement with companies has long been an integral part of our approach to our investment and ESG. We use it not only to understand how companies consider issues related to ESG but also to try to influence their behavior and encourage best practices, for the purpose of enhancing returns for our clients. We engage at scheduled meetings with company management or at meetings specifically arranged to address issues our research has uncovered, either around specific proposals or broader responsibilities and business operations.

We take both a top-down and a bottom-up approach to our engagement. From a top-down perspective, our central Investment Stewardship Team sets priorities for engagements on a firmwide level. The team then uses our proprietary checklist and quantitative scoring, as well as third-party ESG data, to target companies whose shares we own (or might own) when an ESG issue comes into play. The Investment Stewardship Team will then work with the investment teams to engage with the company, recording the results of that engagement in our proprietary database, Spectrum™, to ensure that it is shared with all investors across J.P. Morgan Asset Management, where appropriate. Indeed, all company engagements are written up in Spectrum™ for use by other investment teams.

On a bottom-up basis, investors often identify issues related to ESG through their day-to-day work and interaction with company management teams. In these instances, investors may choose to engage the Investment Stewardship Team. Our fundamental analysts endeavor to meet companies in which we invest at least annually and usually more frequently. Our long history of active management and our stable teams of experienced investors enable us to have ongoing dialogues directly with companies' top management, maximizing our ability to encourage companies to implement best practices on ESG matters.

Portfolio construction

While we do not explicitly exclude individual stocks on ESG criteria (except for certain of our sustainable strategies or when specifically requested by clients or required by local legislation), ESG factors could influence our level of conviction and thus impact a stock's position size during portfolio construction. Although precise methodologies will vary, ESG information is considered throughout the investment process.

Case Study:

A globally consistent 40 question ESG Checklist

Our globally consistent, 40-question ESG checklist contains 12 questions on environmental factors, 12 on social factors and 16 on governance.

The questions are worded so that "yes" is negative, creating a red flag that alerts the portfolio manager to a potential risk. The checklist is not a "pass/fail" exercise but rather a tool to inform discussions between portfolio managers and fundamental analysts, and our engagements with the companies we cover. Among the questions on our checklist:

Environment

- Is the business vulnerable to regulation aimed at limiting greenhouse gas emissions?
- Does the company have issues with toxic emissions, waste management or other environmental damage?
- Is the company failing to responsibly manage its use of water resources?

Social

- Does the company have issues with labor relations?
- Has the company had issues with privacy or data security?
- Does the company engage in anti-competitive behavior and/or treat its customers unfairly?

Governance

- Is the management unable to outline a robust capital allocation methodology for the business?
- Does the board lack diversity in its directors?
- Does the owner have a history of poor governance or of abusing minority shareholders?

Case Study: Engagement

Large European Energy Company

We have engaged with a large energy company on its sustainability strategy on a continual basis over multiple years. Our recent discussion confirmed the company's transition narrative: It is shifting its portfolio to natural gas and investing in renewable energies where it finds attractive potential returns. In the company's view, fossil fuels will still be needed as a reliable source of energy, and gas is a cleaner alternative to coal, emitting 50% to 60% less carbon dioxide (CO2).

However, these efforts will not be sufficient to materially limit CO2 emissions, and this exposes the company to potential costs from more stringent climate-related regulation. This is why the company has been allocating resources to carbon capture, utilization and storage (CCUS)—a technology that reduces the amount of carbon released into the atmosphere—spending 10% of its annual research and development budget on the effort.

To learn more about the company's commitment to CCUS, we arranged a follow-up call with its CCUS and climate experts. We learned that CCUS development, broadly, is far behind the levels needed to reach carbon neutrality and limit temperature rises in line with the goals of the Paris Agreement. This situation is unlikely to change in the near future, as CCUS faces numerous challenges, including the fact that the cost of the technology is high and not expected to fall in the foreseeable future.

The company's significant investment in the technology, even in the face of significant challenges, demonstrates a forward-thinking approach to climate-related risks. Among its peers, the company is a leader in sustainability, addressing the carbon issue seriously and thinking practically about its business implications. That perspective will be key for the industry's viability.

Case Study: Engagement

Flaring issues with U.S. energy companies

Natural gas flaring is the process of combusting natural gas at the wellhead, using a dedicated flare. We believe CO2 combustion through flaring, and methane from unlit and partially burning flares contribute unnecessarily to greenhouse gas emissions, without an economic benefit. Because gas that has been flared has not been captured and sold, this creates societal and economic costs, including forgone revenue streams to federal and state governments and private mineral owners. Operators must therefore preserve their social and regulatory license to operate by recognizing that flaring is a problem, but one with multiple solutions and a compelling long-term economic proposition.

A number of industry participants have begun to differentiate their operating practices when it comes to flaring and, in so doing, deliver substantial emissions reductions. We are observing that some companies have reduced their flaring intensity to as low as 1% of production vs. others that remain greater than 20%. They have achieved these reductions through more deliberate planning and the adoption of widely available technologies and equipment. Consequently, we have been proactively engaging with the oil and gas sector to encourage them to reduce routine flaring, move away from diesel combustion processes during well completions and upgrade their legacy equipment to eliminate further preventable methane releases.

During one of our recent engagements with a U.S. energy company, we asked for a commitment to reduce all flaring to less than 1% of production. The company agreed that flaring is not acceptable and told us it aims to have no routine flaring. However, third-party involvement in its operations meant it would be unable to achieve this goal in the near term. In our engagement, we emphasized the importance of establishing suitably ambitious objectives to reduce the company's environmental footprint through practical business plans supported by enhanced emissions transparency. We will continue to engage with the company to reduce routine flaring. In our centralized system, we noted our concerns about the company's transparency on the emissions issue.

We believe that in a world where carbon emissions are significantly taxed there will be winners and losers in the energy sector. Moreover, a global price for carbon will enable renewable sources of energy to accelerate penetration and reward companies that are less carbon intensive. Furthermore, companies that are demonstrating a lack of leadership and transparency on climate-related issues are likely to be regarded as laggards.

In this particular company engagement, like many others, we incorporate the insights we gain into our risk assessment and investment decision-making.

Fixed Income

As bond investors, we view ourselves as lenders of our clients' money, and we are committed to delivering strong risk-adjusted returns. Consistent with this philosophy, our Global Fixed Income, Currency & Commodities (GFICC) investment process is research-driven and globally integrated.

We expect the issuers in our portfolios to conduct business in a sustainable manner and to demonstrate high standards, and we believe that assessing material ESG risks and opportunities is one of the drivers of long-term performance. We explicitly and systematically take into consideration relevant and material ESG issues, alongside other fundamental factors, in our proprietary analysis and monitor these factors throughout our investment process.

While there are nuances in how we implement ESG integration based on the differences that exist across fixed income sectors, we have a consistent approach that spans three pillars: proprietary research, engagement and portfolio construction.

Proprietary research

We utilize a disciplined and systematic process to evaluate and identify attractive investment opportunities through analysis of fundamental, quantitative and technical investment factors. Proprietary research forms the foundation of our approach to ESG integration, with over 68 career research analysts dedicated to thoroughly analyzing every aspect of an investment, including ESG factors where material and relevant.

Our proprietary research process incorporates inputs such as company regulatory filings, annual reports, company websites, direct communication with companies and government issuers, media, third-party research and proprietary J.P. Morgan Asset Management research. Other inputs include sell-side investment research and reports from industry groups. We have also developed a proprietary materiality matrix, which highlights the key ESG-related risk factors across all fixed income markets. This tool serves to guide analysts' research efforts, ensuring that they focus on the specific topics within each sector that have the most impact. See EXHIBIT 10 for an excerpt of this materiality matrix.

Analysts also have access to third-party ESG data within our research database, which is displayed for each issuer in various ways to track individual environmental, social and governance scores, as well as to observe changes over time. This quantitative data is a supplement to, and not a dictator of, our analysts' views. Our analysts form their own views based on their research and judgment, and this is articulated in a written research report, which contains a specific section for ESG comments.

ESG analysis and research are visible on our centralized technology platform, Spectrum™, and are shared across all investment teams, including fixed income and equities, enabling greater collaboration and leverage across the J.P. Morgan Asset Management platform.

Engagement

Although we do not carry voting rights as bondholders, we engage on a wide range of ESG issues with a variety of market participants.

The C-suite relationships that our research analysts have developed over their careers enable us to engage regularly with company management and representatives of government issuers on matters that are material to our credit assessment, including relevant ESG factors. We also aim to contribute to positive change by participating in industry forums and regularly consulting with third-party data providers and rating agencies.

Our scale and position within the asset management industry allow us significant representation across asset classes: We often conduct engagement at a firmwide level or with our equity counterparts and our centralized Investment Stewardship Team, where our specific company interests align.

The results of our ESG engagement are reflected in the research reports produced by analysts, and they feed back into the overall view of an issuer, thereby directly influencing investment decisions.

Portfolio construction

All qualitative analysis and quantitative metrics for ESG are housed in our common technology platform, Spectrum™, to ensure full transparency and access for all investors. Portfolio managers have a daily view of their exposure to the risks associated with ESG factors, which can also be customized depending on the nature of the portfolio.

In addition to the in-depth, bottom-up research our analysts conduct into each bond, continual monitoring is required to understand the ongoing ESG profile of each portfolio. Our independent risk management team has developed periodic risk reports, sent directly to portfolio managers and accessible in our systems, to enable the portfolio managers to understand the ESG risks to which they are exposed and to identify potential outliers—issuers that stand out as having significantly better or worse ESG scores and practices than their peers.

Given the scale and diverse nature of fixed income markets, each of our sector teams takes a tailored approach to this common GFICC ESG integration process.

- **Corporate credit:** For investment grade (IG) and high yield (HY) corporate issuers across both developed and emerging markets, relevant ESG risks are systematically considered as part of bottom-up fundamental analysis. Included in this fundamental research are the impacts to both current and future cash flows from ESG risks and opportunities. If the analyst believes that the ESG factors are material and may impact issuer risks, this view will be reflected in the overall credit opinion.

  The proprietary fundamental research of our credit analysts incorporates insights from third-party ESG data, research reports and company engagements. Since third-party ESG data is not sufficient in emerging markets, our emerging market (EM) credit analysts supplement their research by consulting with the companies they cover to answer a list of ESG-related questions. This is done in collaboration with equity colleagues, where coverage overlaps and information barriers allow.

  Based on their holistic review of issuer fundamentals and market conditions, IG credit and EM credit analysts perform a proprietary ranking process. Analysts also explain the contribution of ESG factors to their overall issuer view in the "ESG comments" section of their research communication.

  Portfolio managers have access to both the proprietary analyst issuer rankings and third-party ESG scores, and take this information into account to assess the fundamental, quantitative and technical factors in the marketplace and arrive at an investment decision. In addition, IG credit and EM portfolio managers consistently review and discuss ESG outliers at regular meetings with analysts, which fosters greater collaboration and understanding of ESG factors.

- **Developed market sovereign debt:** Our ESG views are conveyed through a scorecard process in which we assess and rank each country's standing on a variety of factors, including those specifically related to environmental, social and governance topics. These scores form the basis of our quantitative analysis of a country's sovereign credit risk and are supplemented by qualitative factors such as the impact of political developments on the fiscal and economic outlook. The scorecard metrics that specifically pertain to ESG include: unemployment rate, government deficit, government debt, control of corruption, Worldwide Governance Indicators, demographics, education levels, energy intensity of GDP, renewable energy, energy imports, competitiveness and ease of doing business. The sovereign scores, which are tracked and plotted over time to provide insight on each country's trajectory, ultimately influence our investment decisions.
- **Emerging market sovereign debt:** Our analysis of EM sovereign debt consists of several proprietary tools to assess a country's ability and willingness to repay its debt, including our Country Fundamental Index (CFI) and Country ESG Index (CESGI). The CFI model provides an independent, objective measure of creditworthiness (by incorporating a number of fundamental indicators spanning solvency, liquidity and structural factors) that is used to calculate fair value spreads. The CESGI model provides a holistic quantitative assessment of ESG factors that is used to calculate an ESG-adjusted fair value spread. The CESGI is constructed by considering over 30 ESG indicators and focusing on those that have more significance in explaining the difference between country spreads and CFI-implied fair value. These factors include: carbon emissions, vulnerability to environmental risks, poverty, gender equality, ease of doing business, corruption and short-term political risks. The output of these quantitative models is supplemented with qualitative comments, informed by analyst research and regular country visits to meet with central bankers, government officials and local analysts.
- **Securitized products:** We conduct bottom-up research on both the underlying collateral and the deal structure of securitized products. The analysis of the collateral focuses on the quality of the underlying receivables and the likelihood that future cash flow payments will ultimately be received. The primary focus of assessing the deal structure is the structural factors that can alter the payments flowing from the collateral to different tranches in the deal, to better understand each security's expected total return under different prepayment or expected loss scenarios. ESG factors are key components of both the collateral and structural analysis we perform, as they can have a notable impact on future cash flows. We have developed a proprietary materiality matrix, which highlights the sources of the most material ESG risks by subsector (for example, conduit mortgage-backed securities [CMBS], asset-backed securities [ABS] airplanes, ABS consumer loans) to guide and direct the efforts of our research analysts (see Exhibit 10). Some of the most material ESG risks in the securitized space that we assess as part of our ongoing analysis include (but are not limited to): geographic concentration and exposure to extreme weather events; carbon footprint; energy, water and waste management; predatory lending; consumer protection laws; potential for underwriting fraud; and quality of reporting. In addition to our focus on proprietary fundamental research, we also leverage the depth of our team (24 dedicated securitized investors) and alternative third-party data and research providers (such as INTEX and Trepp) as a means of uncovering and understanding ESG risks across the securitized space.

- **Municipal bonds:** ESG risks form part of the bottom-up fundamental analysis for municipal bonds. The analysts' credit assessments and subsequent internal rankings incorporate material, relevant ESG risk factors, where information is available. The analysts identify ESG risks relevant to their sectors by using our proprietary materiality matrix. In the municipal space, the analysis may include (but is not limited to): climate risks, energy efficiency, clean water management, pollution abatement, affordability, transparency, litigation risks, pension funding and financial controls. Portfolio managers take into account these internal credit risk assessments when making investment decisions. ESG assessments are reviewed periodically through our governance review process. The size and scope of the municipal bond market, with over 50,000 issuers, makes universal engagement extremely challenging. However, we engage directly with issuers when circumstances warrant or an opportunity exists. We also actively participate in ESG-related industry conferences for both issuers and investors. We continually communicate to issuers, rating agencies, bankers, data vendors and other investors the need for better ESG disclosure and data within the sector.

Case study:

Proprietary ESG research leads to early insight

Over the past couple of years, one of our analysts, a specialist covering retail companies, has had a different view on a French retailer from third-party ESG data providers and the major credit agencies. Third-party ESG data providers ranked this retailer at AA, citing a number of strengths including its development of natural/organic product lines and its pioneering carbon footprint labeling. One third-party ESG data provider did make certain score deductions to its rankings for its pyramid ownership structure (a stake is held by a leveraged holding company) and the concentrated board controlled by the CEO.

We felt, however, that these issues—combined with poor disclosure, questionable accounting practices (including fully consolidating minority-owned entities) and a clear conflict of interest between the CEO and other stakeholders—were not compatible with such a strong ESG ranking or credit rating. Nor did we believe that the bonds for the French retailer priced in these risks.

Our more skeptical view of the company's ESG practices, compared with third-party ESG data providers, was reflected in our analyst's written research report, housed in Spectrum™.

In Q2 2019, the leveraged holding company that owns the majority of the equity in the French retailer got into financial trouble and entered into a restructuring of its debt. This caused the bonds of the French retailer to fall and vastly underperform the wider European high yield market: In Q2 2019, the European high yield market returned 2.3%, while the index-calculated return for the French retailer's debt was -10.7%. The retailer's bonds' credit ratings fell from Ba1/BB by Moody's and S&P, respectively, to B3/B over the course of 2019.

This is an example of how, through our bottom-up proprietary research process, we formulate our own views on an issuer's ESG profile and identify under- or overvalued securities irrespective of third-party ratings.

Case study:

Engagement leads to change on a bank's board of directors

In September 2019, our analyst met with the CEO of a Russian bank and questioned the lack of gender diversity on the board. The CEO was receptive to this conversation and agreed to take it into consideration.

During a follow-up meeting with the CEO in November 2019, the CEO confirmed that the bank had committed to female representation in the upcoming round of board appointments and that it was actively interviewing for the position.

The bank has since appointed the first female member to its board.

This is an example of how, though we do not have voting rights as bond investors, we can still have a meaningful positive influence on the business practices of our portfolio companies.

Case study:

ESG profiles impact portfolio weightings of fintech bond issuers

To supplement the integration of ESG considerations throughout our fundamental, proprietary research process, our global investment grade portfolio management team reviews the ESG score of each ticker, by industry, to identify ESG outliers and potential overweight or underweight positions for portfolios.

This comparison of portfolio positioning with third-party (MSCI) ESG data provides a reference point to help focus discussions at an industry/ticker level within the broad investment grade universe, and to promote additional dialogue with research analysts. It can also impact portfolio construction decisions.

As part of this review process, our portfolio managers identified two issuers in the fintech sector with comparable credit metrics and yet very different ESG profiles. Both issuers were payment processing companies in the sterling market with the same credit rating, trading at a similar spread over UK government bond yields. However, one company had significantly more stringent data privacy and cybersecurity protocols. In the fintech sector, the strength of these protocols can have a material impact on future cash flows—an illustration of the importance of carrying out this ESG score review on an industry-by-industry basis.

Our analysts verified the two companies' ESG profiles with their own research. As a result, the portfolio management team reflected the difference in portfolio positioning by overweighting the issuer with positive cybersecurity protocols and underweighting the other.

This is an example of how ESG factors are considered throughout multiple stages of the portfolio construction process and can ultimately impact portfolio positioning.

EXHIBIT 10: PROPRIETARY MATERIALITY MATRIX USED IN THE RESEARCH PROCESS

	Industry	Environmental	Social	Governance	Comments
Corporate	Basic Industry	High	Low	High	E: Metals, chemicals, paper industries inherently alter, pollute, & corrupt natural landscape S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, anti-corruption policies integral for multinational conglomerates
Corporate	Capital Goods	Low/Medium	Low	High	E: Non-resource intensive manufacturing w/ focus on clean tech & minimizing waste material S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, anti-corruption policies integral for multinational conglomerates
Corporate	Communications	Low	Medium	High	E: Limited effect across cable/satellite, wireless and wirelines sectors S: Labor management can be of heightened concern, companies have larger social profile G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Consumer Cyclical	Low	Medium	High	E: Limited effect across auto, gaming, home construction, lodging leisure sectors S: Labor management can be of heightened concern, companies have larger social profile G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Consumer Non-Cyclical	Low/Medium	Low/ Medium	High	E: Food & beverage sector has largest environmental footprint; healthcare more limited S: Labor management can be of heightened concern and product safety/quality is critical G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Energy	High	Low	High	E: Exploration & Production industries inherently alter, pollute, & corrupt natural landscape S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, anti-corruption policies integral for multinational conglomerates
Corporate	Finance	Immaterial	Medium	High	E: Limited effect across the sectors S: Responsible investing is part of business model but social profile is important post GFC G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Other Industrial	Low/Medium	Low	High	E: Industrial companies have slightly larger environmental footprint but very credit specific S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Technology	Immaterial/Low	Low	High	E: Limited effect across the sector S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Transportation	Medium	Low	High	E: Airlines and amount of carbon emissions are primary factors within this small industry S: Labor management can be of heightened concern, no more than other industries G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Corporate	Utilities	High	Low/ Medium	High	E: Power production and generation source are key considerations for investment S: Labor management can be of heightened concern as well as health & safety in workplace G: Ownership, accounting, regulatory & anti-competitive practices significant considerations
Securitised	Agency RMBS/ Agency CMBS	Low	Low	High	E: Geographically concentrated securities a key consideration S: Borrower/servicer dynamics could impact prepayments & defaults G: Conservatorship of the GSEs & management/oversight of GSEs significant considerations
Securitised	Non-agency MBS	Low	Low	High	E: Geographically concentrated securities a key consideration S: Borrower/servicer dynamics could impact prepayments & defaults G: Business ethics of issuer & trustee significant considerations; potential for fraud in underwriting of loans
Securitised	CMBS	Low/Medium	Low	High	E: Key considerations: geographic concentration, environmental impacts, LEEDS, access to green financing S: Sourcing and underwriting of underlying loans G: Considerations: business ethics of issuer/borrower/trustee; zoning restrictions; land regulatory requirements
Securitised	ABS*	Low	Low/ Medium	High	E: Key considerations: energy efficiency of collateral & carbon footprint, geographically concentrated securities S: Key considerations: sourcing, underwriting & servicing of underlying loans; predatory lending; reputation risk G: Key considerations: business ethics of issuer/borrower/trustee; potential for underwriting fraud
Rates	Developed Markets	Low	Low/ Medium	High	E: Energy intensity of GDP, renewable energy and energy imports S: Unemployment rates, demographics, education and competitiveness G: Government finances (deficit & debt) and control of corruption
EMD	Local Ccy Sovereign	Low/Medium	High	High	E: Reliance on particular sectors (oil, coal) for country financing poses a risk, though very country specific S: Treatment of minorities, welfare, education, unemployment rates, labor management and competitiveness G: Stability, effectiveness, regulatory quality, transparency, corruption; elections & political tensions
EMD	Hard Ccy Sovereign	Low/Medium	High	High	
EMD	Hard Ccy Corporate**	Medium	Medium	High	E: Significant variation across industries & credits, extent to which they alter, pollute, corrupt natural landscape S: Labor management, health & safety in workplace, data security, product safety or mis-selling G: Ownership, board structure, accounting, regulatory & anti-competitive practices significant considerations

	Industry	Environmental	Social	Governance	Comments
Municipals	Electric Utilities	High	High	High	E: Pollution abatement and gov't standards (infrastructure meets federal/state pollution control requirements) S: Costs of pollutants are potentially high and immediate, sustainability and reliability of supply required G: Transparency, financial controls, independence, resoluteness, fiscal balance, thoughtful capital planning
	Water & Sewer	High	High	High	E: Pollution abatement and water purity & conservation S: Sufficient supply for community and public confidence in quality safe water G: Transparency, financial controls, independence, resoluteness, fiscal balance, thoughtful capital planning
	Healthcare	Low	High/ Medium	High/ Medium	E: Energy efficiency/LEED standards S: Community benefit (patient care, education); access for poor/uninsured; creates job opportunities G: Transparency, financial controls key considerations
	Higher Education	Low	High/ Medium	High/ Medium	E: Campus projects to reduce carbon footprint; compliance with state/federal environmental guidelines S: Broader access, affordability and demographic diversity G: Transparency, board and management accountability, financial controls key considerations
	Student Loans	Low	High/ Medium	High/ Medium	E: Limited effect across the sector S: Affordable access to higher education financing programs G: Transparency, financial controls, political & governance independence key considerations
	Housing	Low	High/ Medium	High/ Medium	E: Projects to achieve reduction/improvement of housing project's environmental footprint S: Provides housing for those meeting certain income restrictions G: Transparency, financial controls, political & governance independence key considerations
	Transportation	High/Medium	Medium	High/ Medium	E: Pollutant reduction & land conservation (public transit); fuel saving (high occupancy lanes) S: Affordable access; mobility for those who cannot drive/limited mobility; creates job opportunities G: Transparency, financial controls, political & governance independence key considerations
	States, Cities, Local Gov't	Medium	High/ Medium	Medium	E: Projects addressing environmental hazards; regulatory compliance S: Provide infrastructure for public use/demand (schools, libraries, parks, etc.); fairness/access to adjudication G: Transparency, financial controls, checks & balances, institutionalised process
	School Districts	Low	High/ Medium	Medium	E: Implementation of eco-friendly projects aimed at improving environmental footprint of school districts S: Provide infrastructure for public use/demand G: Transparency, financial controls, checks & balances, institutionalised process

Source: J.P. Morgan Asset Management Global Fixed Income Currency & Commodities Group. For illustrative purposes only. Subject to change. As at December 2018. *Environmental considerations for ABS – cards, ABS – consumer loans, and ABS – student loans not applicable. Social considerations for ABS – airplanes not applicable. E / S / G risks will vary across different types of ABS. **E / S / G risks will vary meaningfully across different EM corporates.

Alternatives – Macro Strategies

Our overall approach to ESG integration

We integrate ESG analysis into our process to mitigate potential negative risk scenarios as a result of issues related to ESG. The consideration of potential ESG risk is one of a number of key inputs to our investment decision-making that can influence the choice to buy, disinvest or adjust position sizing in a particular security. Our ESG integration consists of three main components: ESG scoring, fundamental analysis and active ownership.

- **ESG scoring:** Third-party scores provide an objective quantitative framework for the consideration of ESG risk. We leverage ESG scoring and the associated analysis from MSCI, using the ESG scores for equity and credit, and the country scores for sovereign debt, which feed into our factor analysis tool in Spectrum™, our proprietary portfolio and risk management system. Using this tool, we can see our portfolios' aggregate ESG scores, their component parts and the scores for the broader universe.
- **Fundamental analysis:** Our fundamental analysis draws on proprietary, broker and ESG-specific third-party research, as well as our understanding of inherent ESG factors in different countries, sectors, industries and activities. This analysis is documented in our research notes in Spectrum™ for reference and to monitor any shifts over time.
- **Active ownership:** The Macro Strategies team often engages with corporate management directly for companies where we have a large holding or area of interest, while the Investment Stewardship Team of J.P. Morgan Asset Management connects with companies on five key stewardship priorities and oversees proxy voting across the platform, including for our funds. Further, our colleagues across other asset classes engage with company management and share their insights. In sum, we believe that our active ownership enhances our ESG analysis and supports our ability to encourage companies on issues related to ESG.

Case study

Software & Services company

Investment thesis: One of our macro themes, widespread technology adoption, identifies a number of specific areas of opportunity, which currently include the shift to cloud computing. The company's large enterprise install base, tight integration across its application ecosystem and the value proposition it brings to the hybrid cloud put it in a prime position to become a more meaningful player in this fast-growing area. The company's integration with other technology platforms and services differentiates it from its competitors in the space.

Risk considerations:

- Increased competition in the enterprise market, limiting market share gains
- Pricing pressure preventing overall margin expansion potential
- Cloud growth cannibalizing the company's on-premise business
- ESG-specific: alleged bribery, suggesting potential corruption in practices

Additional ESG analysis:

- MSCI ESG industry-adjusted score: 10
- ISS ESG norms-based flag: Amber, for bribery and corruption case

Fundamental analysis

The company excels on an absolute basis in our view and relative to other companies in the Software & Services sector in the key areas of ESG consideration for the sector. Below is a summary of the analysis of each of the relevant ESG areas (**EXHIBIT 11**). We also evaluated the issue of corruption as a company-specific consideration, which is reflected in the company's amber rating by third-party ESG research provider ISS ESG.

EXHIBIT 11: SUMMARY, ANALYSIS OF RELEVANT ESG AREAS FOR A SOFTWARE & SERVICES COMPANY

Key issues in Software & Services	Company approach/commitment
Carbon emissions	Greenhouse gas reduction targets; commitment to becoming carbon negative for 2030; and aim to remove, by 2050, all the carbon the company has emitted directly or by electrical consumption since it was founded. Internal carbon tax increased (paid by business units to offset their emissions). A member of the Climate Leadership Council.
Corporate governance	Strong corporate governance, with practices generally aligned to shareholder interests.
Privacy & data security	Data security policies and annual budget of USD 1 billion for cybersecurity research and development. An advocate for privacy legislation, committed to General Data Protection Regulation (GDPR) compliance, having applied it globally.
Corruption & instability	Amber flag for company signaled ESG concerns related to alleged bribery in Hungary from 2013-15. Flag is lowest level amber at 6/10 (1-10 from best to worst). Anti-bribery programs and procedures in place.
Human capital development	Focus on managerial and leadership training initiatives for widespread employee development.
Opportunities in clean tech	Provider of IT infrastructure and services with energy and environmental benefits, offering cloud computing, data center efficiency solutions and energy management software tools.

Source: J.P. Morgan Asset Management.

Overall, we are comfortable that the company does not present material ESG risks. One ESG risk flagged in our analysis relates to alleged bribery. We believe that the risk of corruption to shareholder value is low due to enhancements made to compliance and internal controls following an alleged incident in Hungary in 2013-15. Furthermore, in response to the incident, the company paid a USD 9 million fine, with no further financial impact anticipated. The impact of this fine was relatively minimal in the context of the company's USD 1.5 trillion market cap and USD 53 billion net cash position as of March 31, 2020. The company also took remedial action in its Hungary business through contract terminations and disciplinary action for employees.

Since we invested in the company in July 2018, its price return has risen 82% vs. a 46% gain for the broader Software & Services sector.[24] Given that the company was given its Amber rating in November 2018, its return demonstrates that the alleged incident has had a minimal impact on shareholder value. While the company continues to have an amber flag from ISS Ethix, a provider of corporate governance and responsible investment information, we are comfortable that it has taken the necessary steps to strengthen its controls, that corruption is not a systemic issue with the potential to impact shareholder value and that the company remains Green for all other norms.

Active ownership:

Our J.P. Morgan Asset Management firm-wide Investment Stewardship Team chaired a roundtable with the company in 2019. Among the topics discussed: corporate culture, sexual harassment, diversity, biases in hiring and interviewing, staff turnover, privacy and data security, and carbon tax.

[24] Before dividends; data from Bloomberg as of June 16, 2020.

Alternatives – Infrastructure

Infrastructure assets play a critical role in the sustainable operations of communities, providing safe, clean, reliable, affordable and essential services that people depend upon in their daily lives. The safety of employees, customers and communities is central to an infrastructure company's ability to operate—otherwise known as the "social license."

J.P. Morgan Asset Management's approach to direct infrastructure investment incorporates ESG considerations into the investment and portfolio management processes to better manage risk and generate sustainable, long-term returns. Active governance, through controlling ownership stakes and majority independent directors, is the first stage in designing and implementing ESG practices appropriate for a company and its stakeholders. Active governance enables effective engagement with, and oversight of, the risks and opportunities that can affect an infrastructure company over the long run and significantly impact its ability to achieve its long-term objectives.

The consideration of ESG risks and opportunities during infrastructure acquisition due diligence is fundamental to decision-making and includes, as applicable, analysis of: governance framework (generally majority control), organizational culture (including diversity and inclusion), health and safety performance, stakeholder engagement and community impact, environmental impacts of and on the target, cybersecurity and information protection, climate change risks and opportunities (transition and physical), anti-corruption and catastrophe resilience. Once an investment is made, identified ESG risks and opportunities are generally addressed in the 100-day post-acquisition plan, which includes priorities identified during due diligence and in plans for compensation alignment; ESG risks and opportunities are also part of ongoing governance frameworks.

We view ESG as an important element in forward-looking strategic positioning rather than a backward-looking compliance consideration. Recent specific examples of ESG initiatives in direct infrastructure include:

Case study:

Addressing climate risks/opportunities and preparing for the energy transition

In our approach to direct infrastructure investment, we continually evaluate and manage climate risks and opportunities. J.P. Morgan Asset Management's direct infrastructure team works with each investee company to understand the physical and transition risks of climate change, along with stranded asset risk and a range of regulatory, policy and political risks and opportunities.

In addition to working with investee companies to acquire over 4.8 gigawatts (GW) of renewable capacity, the direct infrastructure team works with nonrenewable investee companies that are taking innovative approaches to reducing reliance on fossil fuels. For example, a U.S. natural gas investee company introduced a renewable natural gas initiative in Maine. It is aimed at supporting the local economy, reducing GHG emissions and fighting climate change through the creation of renewable gas using cow manure, thereby increasing the company's ability to attract new customers who oppose the use of fossil fuels. Other renewable initiatives include a terminal business that partnered with a customer to develop and store biofuels, thus creating a new revenue stream while reducing exposure to fossil fuels. In another instance, a rail business converted locomotives from diesel to electric, extending their useful lives and, by extension, their financial contribution to the company. These initiatives are all components of our ongoing participation in a sustainable energy transition through investment in innovative technologies that mitigate climate change.

Case study:

Focus on Stakeholder and Community Engagement

J.P. Morgan Asset Management's direct infrastructure team believes stakeholder engagement is key to long-term sustainability. Working closely with investee companies, we identify their key stakeholders (customers, employees, contractors, companies in their supply chain, regulators, government officials and community groups) to understand the effect of such stakeholders on the company and the company's effect on such stakeholders. We aim to design engagement programs to build and maintain relationships, provide transparent communication and deliver meaningful benefits to stakeholders (such as contributing to philanthropic initiatives, educating customers on conservation efforts and providing internships and job opportunities in the local economy). For example, a U.S.-based investee company provided each employee with 20 hours of volunteer time off (VTO), resulting in 2,000 VTO hours in 2019 (twice as much as the previous year) as well as providing positive outcomes for the community, increased employee engagement and improved relationships with customers and regulators. The program has a clear impact on the company's financial prospects.

Alternatives – Private Equity

The objective of the Private Equity Group (PEG) of J.P. Morgan Asset Management is to identify and select attractive investments for its clients from a broad spectrum of private equity investment opportunities. Our ultimate objective: to provide attractive, risk-adjusted returns.

PEG abides by the group's own ESG policy as it looks to achieve this objective. The team's standard investment process includes due diligence on sustainability, a written investment memorandum and ongoing discussions with the portfolio managers of PEG with respect to sustainability issues. This process includes clarification and assessment of material environmental, social and governance risk factors. When investing in a third-party manager, PEG encourages the underlying third-party managers with which it invests to carefully consider these factors in their own investment due diligence. Sustainability considerations are an important component of both the initial due diligence and screening process and the ongoing monitoring of investments.

The investment strategy at the foundation of PEG has been developed and refined over 40 years and through a wide range of market and investment environments. Consistent with PEG's ultimate objective of providing attractive, risk-adjusted returns, specific companies and investment managers, or types of companies and managers, are not excluded from client portfolios solely on the basis of ESG criteria. However, PEG views issues related to sustainability as important factors that are likely to impact performance and therefore must be carefully considered as part of the investment review process. PEG believes that sustainability considerations should be reviewed holistically to account both for material risks and for potential opportunities that may make companies or underlying managers more or less attractive for investment.

Case study:

Addressing issues related to ESG in the manager selection process

For each investment opportunity, PEG assembles a deal team (typically three to five professionals) responsible for conducting due diligence. Here's an example of how that process might unfold. On one occasion, while conducting due diligence on a fund manager, the deal team learned that one of the assets within that fund manager's portfolio was located very close to the habitat of a protected species. It thus had the potential to threaten the biodiversity of wildlife. The deal team researched this issue, among other merits and risks of the investment; held discussions with PEG and the manager; and provided a mitigation analysis to PEG prior to investment. The underwriting of the investment included an ESG risk analysis ensuring that the manager and company were operating under applicable law. As a result, the company created a 200-meter buffer area to protect the habitat. This measure was important to PEG as an investor. Ensuring that a company operates within environmental and regulatory law provides long-term value to our own clients and underscores the importance of governance and a commitment to sustainability.

Case study:

ESG monitoring in a direct investment

During due diligence for an investment in an environmental waste management business in 2015, a potential environmental issue at one company site was identified as an area of concern. Our capital was used in large part to remediate the environmental concern, which had been a long-standing issue for the company that had not been adequately addressed. As such, a key part of our monitoring of this investment was to ensure that remediation was progressing toward completion. Overall, this company now has a key focus on safety and environmental compliance. Monitoring this outcome has been important to PEG for the purpose of carrying out the objectives for this investment and creating a strong financial return for clients.

Alternatives – Real Estate

The Real Estate team believes that continually improving the integration of our investing—and of our assets themselves—with ESG factors can ultimately improve the environment in which those assets exist and enhance their competitiveness in the real estate marketplace. We integrate ESG into investment decisions and have fully integrated sustainability objectives into our overall business strategy. These objectives are publicly posted on our website: https://am.jpmorgan.com/gi/getdoc/1383513210544

We identify and evaluate ESG opportunities and risks before making new investments as part of our real estate asset due diligence process, and continue to evaluate ESG opportunities and risks for our existing investments. Our goal is to mitigate risks and capitalize on opportunities. Our ESG objectives and strategies include:

Environmental

- Consistently measuring, monitoring and improving environmental performance at the assets to meet reduction targets for energy use, greenhouse gas emissions, water use and amount of garbage waste.
- Targeting long-term reduction of energy use, GHG emissions, water use and total waste by 1.5% annually.
- Improving our assets' performance on ESG metrics by identifying low cost measures that can be implemented and making strategic capital improvements, while assessing new technologies.
- Achieving ENERGY STAR certification for eligible buildings annually.
- Evaluating and pursuing third-party green building certifications such as LEED and IREM Certified Sustainable Property, as well as health and wellness certifications such as WELL and Fitwel, wherever feasible.
- Incorporating ESG into our due diligence process for real estate acquisitions, including by considering any potential climate change impacts in the metropolitan statistical area (MSA) where the asset is located, such as flooding, extreme temperatures and droughts, and identifying local resiliency strategies.

Social

- Acting as a responsible corporate citizen and fostering responsibility among our key stakeholders, such as tenants and property managers.
- Being a socially responsible landlord, managing the operating costs of our buildings and improving the occupant experience by having more efficient, well-maintained buildings that provide a good environment for living, working and visiting.
- Engaging our employees and tenants through educational materials, sustainability programming and social events.
- Promoting the health and well-being of our employees, building occupants and communities. Property teams facilitate health and well-being for occupants through attending to indoor air quality, encouraging exercise opportunities, hosting events that educate occupants and engaging with the local community.
- Ensuring regular communication with our third-party property managers on sustainability best practices by providing resources, tools and training.

Governance, including code of ethics

- Guiding and managing accountability for our sustainability efforts at our assets (and on our team) through our ESG Taskforce.
- Ensuring timely and accurate disclosure to investors of our ESG objectives, strategies and performance results at our properties.
- Leading the industry in ESG practices through participation and membership in industry groups such as GRESB, UN PRI, the U.S. Green Building Council, the International Council of Shopping Centers, the Urban Land Institute, National Association of Real Estate Investment Managers (NAREIM) and the National Council of Real Estate Investment Fiduciaries.

J.P. Morgan is a member of GRESB (formerly the Global Real Estate Sustainability Benchmark), a provider of ESG benchmarks for real assets. We have participated in its annual assessment, which measures and monitors the real estate industry's progress in incorporating ESG factors, since the survey's inception and have increased our overall score since 2015. In 2019, the J.P. Morgan Asset Management Strategic Property Fund ranked in the top quartile of its peer group, third out of 47. The fund also achieved five out of five Green Stars, placing us in the top quintile of over 1,000 participants.

Case study:

Sustainability at Dallas, Texas: McKinney & Olive

McKinney & Olive is a 20-story, Class A+ office building. Construction was completed in 2016 and LEED Core and Shell certification and U.S. Green Building Council certification, were pursued. We feel our philosophy of developing, owning and operating efficient assets produces assets that have a higher net operating income, lower vacancy, lower occupancy cost for tenants as well as better tenant satisfaction. We believe these all lead to higher valued assets and better returns over time for our clients. The McKinney & Olive property has achieved the prestigious LEED v4 for Building Operations and Maintenance: Existing Buildings Gold certification. Project highlights include:

Location and transportation

- Reduced emissions from conventional commuting trips by 23%, attributable to occupants' use of fuel-efficient vehicles.

Sustainable sites

- Implemented a Site Management policy with practices including composting 100% of landscape debris, applying organic fertilizer based on soil testing, monitoring irrigation systems biweekly for leaks and using manual methods for weed control.
- Reduced heat island effect on the parking garage by adding sails that cover 88% of the top level of the parking deck.

Water efficiency

- Reduced indoor plumbing water use by 35% compared with standard fixtures by installing high efficiency fixtures that reduce water usage by approximately 939,500 gallons per year, resulting in an annual savings of about USD 9,000.
- Reduced outdoor water use by 68% by having on-site native and adaptive vegetation, as well as a high efficiency irrigation system with weather-based electronic controls and a pressure compensating drip system.

Energy and atmosphere

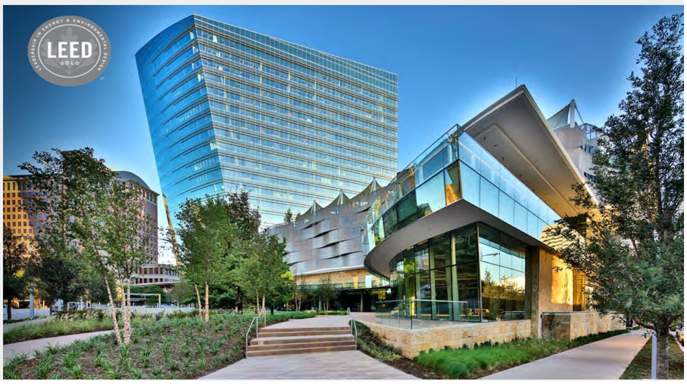
- Earned the U.S. Environmental Protection Agency's ENERGY STAR certification with a score of 90, placing it in the top 10% in energy efficiency among similar properties.
- Implemented low cost energy conservation measures that we estimate save 273,490 kilowatt-hours (kWh) every year, resulting in an annual savings of approximately USD 22,000 and an annual reduction of 204 metric tons of CO2–equivalent to the emissions produced by 31 homes annually from electricity usage.

Materials and resources

- A lamp-purchasing plan reduced mercury content in the building's lamps to less than 35 picograms per lumen-hour.

Indoor environmental quality

- Purchased 100% sustainable cleaning products during the performance period, including Green Seal®-certified chemicals and paper products with recycled content.
- Utilized high grade air-conditioning filters. All outside air is filtered with MERV 8 pre-filters and MERV 13 final filters, resulting in improved air quality for building occupants.



Solutions – Quantitative Beta

The Quantitative Beta Solutions team manages rules-based, systematic portfolios. Our approach includes strategies in which we rank equity or fixed income securities on a number of factors, such as their relative value, quality or recent price momentum, and systematically invest in the best-ranked names. While the purely quantitative nature of our investment process makes the traditionally fundamental approach to ESG integration challenging, sustainability remains a key consideration for our business and our clients, and one that we integrate across our investment platform.

A key challenge for quantitative investors pursuing ESG integration is data quality and history. We want to test our models across multiple market cycles and geographies, but, unfortunately, most ESG-related data does not extend back very far. Luckily, as the quality and availability of ESG data and the number of data providers continue to improve, we are able to incorporate these metrics into our rules-based investment approach.

Example of research:

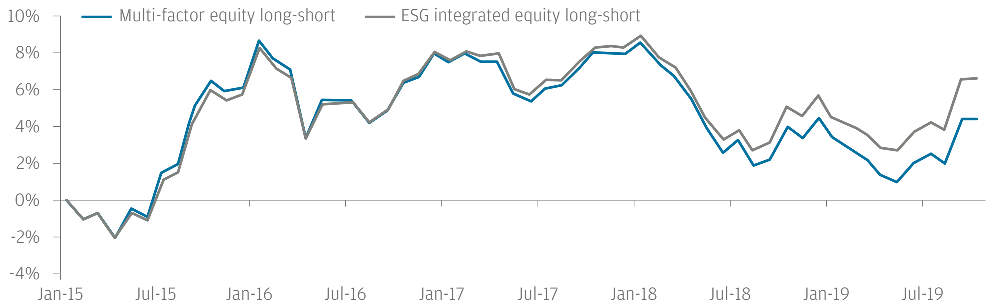
Integrating ESG considerations into factor portfolios

The following hypothetical scenario is an illustrative example of our process: We would start with a broad universe of developed market stocks. We would rank these stocks, compared with their peers in the same region and sector, on a number of metrics relating to value (for example, price-to-book), quality (for example, return on equity) and recent price momentum. We would then take long positions in the best-ranked stocks and short the worst-ranked names.

We compare this with an ESG integrated portfolio to which we have applied the exact same process, and only take long positions if the stock has a strong multi-factor score and its MSCI ESG score is not in the bottom 10%.

Over the past five years, the hypothetical portfolio would have provided a similar level of return, a reduced level of risk and, of course, an improved ESG score—without reducing the overall multi-factor score (**EXHIBIT 12**).

EXHIBIT 12: APPLYING ESG INTEGRATION TO A HYPOTHETICAL MULTI-FACTOR EQUITY LONG-SHORT PORTFOLIO REDUCES RISK WITH SIMILAR RETURNS



	Multi-factor portfolio	ESG integrated portfolio
Annualized return	1.1%	1.5%
Volatility	4.0%	3.9%
Risk-adjusted return	0.26	0.38
Average ESG score (long positions)	5.3	5.6

Source: J.P. Morgan Asset Management. Analysis period: January 2015 to October 2019. The analysis refers to simulated past performance. Past performance is not a reliable indicator of current and future results. The hypothetical performance calculations are shown for illustrated purposes only and are not meant to be representative of actual results achieved by the manager while investing in the respective strategies over the time periods shown. The hypothetical performance calculations for the respective strategies are shown gross of fees. If fees were included returns would be lower. Hypothetical performance returns reflect the reinvestment of all dividends. The hypothetical performance period is from (insert time period). The hypothetical performance results have certain inherent limitations. Unlike an actual performance record, they do not reflect actual trading, liquidity constraints, fees and other costs. Also, since the trades have not actually been executed, the results may have under-or-over compensated for the impact of certain market factors such as lack of liquidity. Simulated trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. These hypothetical performance results do not take into consideration the ongoing implementation of the manager's proprietary investment strategies. No representation is being made that any portfolio will or is likely to achieve profits or losses similar to those shown. Returns will fluctuate and an investment upon redemption may be worth more or less than its original value.

Solutions – Manager Selection

ESG Integration – Multi-Asset Solutions

Multi-Asset Solutions (MAS) takes ESG factors into consideration from both a top-down and a bottom-up perspective—in top-down asset allocation decisions and the bottom-up fundamental research of our underlying managers, where applicable. From a top-down perspective, we evaluate whether there is adequate compensation for the additional risk premium required for investing in asset classes with relatively immature corporate governance institutions or riskier operating and/or capital structures.

From a bottom-up perspective, ESG analysis is conducted via the fundamental investing process of the underlying fund managers, who assess materiality of ESG risk and determine whether they are adequately compensated for that risk at the company or issuer level.

We also seek to mitigate ESG risks in the strategy selection and risk management components of our investment process. Strategy selection combines manager research and portfolio construction. Here the manager research team looks to understand how ESG is considered within an underlying manager's investment process, how the manager defines and mitigates material ESG risks, and the investment rationales for the inclusion of securities that may score poorly and/or contain perceived headline risk. MAS portfolio managers then evaluate the portfolio construction benefits of including a manager with higher perceived ESG risk vs. the incremental risk that the manager introduces at the total portfolio level. Generally speaking, managers that are valuation-sensitive or biased toward carry tend to have the highest perceived ESG risks, but simply excluding them from the underlying opportunity set results in an unbalanced portfolio and suboptimal risk-adjusted returns over longer time horizons.

Consistent with the standards set forth across J.P. Morgan Asset Management, MAS has implemented technology and governance enhancements to efficiently facilitate integration of ESG considerations into our process. For example, portfolio management and construction tools such as Spectrum™ can identify fund- and security-level outliers, data also available to an independent risk management group that conducts ESG risk discussions at the total portfolio level—an important second line of defense.

Global Liquidity

Overview

The J.P. Morgan Global Liquidity team's primary focus is providing capital preservation and liquidity. Fundamentally safe and sound cash portfolios, like those that we deliver, also have a larger economic role: They are necessary for other capital markets to function effectively. Because risks can materialize across the investment realm in so many ways, the information that environmental, social and governance factors can provide about institutions' future cash flows and the integrity of their balance sheets is distinct and meaningful.

Global Liquidity's ESG philosophy

Our conservative investment philosophy is to preserve principal and maintain liquidity while generating a competitive return. As we aim to fulfill those goals, Global Liquidity incorporates relevant and material environmental, social and governance factors into our rigorous investment process to inform better investment decisions. We consider material ESG factors alongside other market risk considerations, such as event risk and headline (news media) risk.

Approach and integration

Global Liquidity partners with our colleagues in Global Fixed Income Currency & Commodities to assemble an array of analytical resources. Our teams of analysts utilize both top-down and bottom-up approaches, seeking to converge on ultra-short and short-term fixed income assets providing good risk-adjusted returns. Market research coupled with fundamental credit analysis provides an unusually disciplined framework.

As part of our security selection strategy, investment teams evaluate whether sustainability issues could materially impact the cash flows or risk profiles of the many companies in the investible universe. And while no issuer or specific asset is excluded from portfolios solely based on ESG criteria—unless mandated by regulation or requested by clients—E, S and G factors can change a security's fundamental outlook and expand or limit our ability to invest in a company or asset.

Our governance

Our production teams convene monthly investment forums to review portfolio strategies and execution. At these forums, our teams examine our largest funds by weighted ESG ratings, derived from MSCI ESG Ratings, and consider ESG characteristics across the platform. The teams also examine the best and worst ESG-rated holdings among the products in our portfolios; this reminds our teams which investments best demonstrate our commitment to building a better world.

Global Liquidity's ESG leadership team is charged with maintaining teammates' focus on the product line's sustainability efforts. The team's work includes furthering ESG integration into our investment process and training our teammates to utilize ESG factors effectively and be able to speak fluently about the process. The ESG leadership team consists of senior portfolio managers, analysts and distribution professionals across geographic regions.

Portfolio guidelines

GFICC's research analysts incorporate ESG factors into their proprietary fundamental credit ratings, and these fundamental ratings ultimately determine what securities make it onto an approved list of various debt issuers and instruments that Global Liquidity can purchase. For highly rated credits, we allow higher portfolio concentrations and the purchase of longer maturities. For lower rated credits, our portfolios have less access to them or the instruments are excluded altogether from approved-for-purchase lists. Within the last two years, several banks have been cited for serious money-laundering violations, and our analysts have responded accordingly by reducing limits and, in one case, eliminating an issuer from the approved lists.

Trading

We utilize an ESG rating service to provide adept, objective opinions related to sustainability issues, and we use those specific ESG ratings in conjunction with our proprietary analytics and fundamental credit ratings. Our proprietary trading system shows environmental, social and governance factor scores provided by vendors that allow portfolio managers to review similar trade opportunities (by yield and maturity) and make additional comparisons using these scores. As a result, a large Japanese bank with poor governance and environmental scores has missed several funding opportunities with our platform, particularly when banks with better ESG ratings provided similar return profiles.

BUILDING STRONGER PORTFOLIOS

At J.P. Morgan Asset Management, collaborating with our clients in an effort to build stronger portfolios drives everything we do.

We are committed to sharing our expertise, insights and solutions to help make better investment decisions. Whatever you are looking to achieve, together we can solve it.

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