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J.P. Morgan Perspectives

ESG and COVID-19: Friends or Foes?



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JPMorgan Chase's Approach to Environmental, Social and Governance Matters

At JPMorgan Chase, environmental, social and governance (ESG) considerations are integrated into the policies and principles that govern our business. Our approach to ESG management includes having robust governance systems; risk management and controls; striving to serve our customers exceptionally and transparently; investing in our employees and cultivating a diverse and inclusive work environment; working to strengthen the communities in which we live and work; and advancing sustainable solutions for our clients and our operations.

We share information about our ESG performance through a number of channels. We maintain a dedicated ESG Information page on our website and publish an annual ESG Report, which is designed to summarize our work on key topics that we and our stakeholders view as important to our business. For the first time, this year's ESG Report is informed by the Sustainability Accounting Standards Board (SASB) standards, and a separate index maps our firm's disclosures against the SASB metrics relevant to the sectors in which our firm operates. In 2019, we released our inaugural climate report, which was informed by the Task Force on Climate-related Financial Disclosures (TCFD) and discusses our approach toward managing climate-related risks and how we are capitalizing on the opportunities that arise through a transition to a lower-carbon economy. The firm's publicly available Environmental and Social Policy Framework provides an overview of our approach to evaluating risks posed by environmental and social matters, including certain activities that we will not finance, and sectors and activities subject to environmental and social due diligence.

In 2017, JPMorgan Chase made two sustainability commitments: facilitate \$200 billion in clean financing by 2025 and source renewable energy for 100 percent of its global power needs by 2020. Both of these goals are expected to be reached by the end of 2020. And now, JPMorgan Chase is taking additional steps to address climate change and further promote sustainable development, including:

- Facilitating \$200 billion in 2020 for transactions that support climate action and efforts to advance the United Nations Sustainable Development Goals, including \$50 billion toward green initiatives that also fulfill the 2017 clean financing target;
- Supporting market-based policy solutions to address climate change and protect consumers;
- Expanding restrictions on financing for coal mining and coal-fired power, and prohibiting project financing for new oil and gas development in the Arctic;
- Enhancing J.P. Morgan Asset Management's investment stewardship process, joining Climate Action 100+; and
- Expanding deployment of renewable energy in our operations.

The ESG issues we are tackling are significant and require sustained commitment and resources over the long term. We will continue to provide updates to our stakeholders on our efforts. You are welcome to learn more at www.jpmorganchase.com/ESG.

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Executive summary

Will COVID-19 accelerate the sustainability initiatives?

- COVID-19 will go down in history as the 21st century's first sustainability crisis, and nowhere are the cross-currents from these paradigm shifts clearer than in the climate action arena.
- We view the COVID-19 pandemic as an accelerant that will drive the paradigm shifts that were already in motion after the 2008 Global Financial Crisis.
- Europe was a leader in sustainable finance pre-pandemic and continues to push for a green recovery...
- ...while the US appears likely to roll back environmental regulations and redirect resources to COVID-19 emergency services and away from climate resilience.
- The private sector is taking the lead in the ESG movement in the US, as corporates have adopted policies that prioritize human capital issues related to workers, customers, and communities in response to the pandemic.

Rise of the 'S' (Social) and 'G' (Governance) pillars in ESG

- COVID-19 has broadened focus beyond the 'E' (Environmental) factor, and the Social and Governance pillars will receive greater focus within ESG.
- COVID-19 is accelerating the trend of stakeholder capitalism and challenging shareholder primacy.
- Further regulatory changes establishing more rigorous corporate governance requirements will likely be adopted in Europe.

ESG market developments

- Using the broadest classification, assets following global sustainable investing approaches exceed \$45trn, with ESG investing expanding in the US and Asia and moving beyond active equity management.
- Within the narrower universe of funds with ESG-related attributes that are systematically and actively incorporated into investment processes and decisions, retail ESG assets were on the order of \$720bn in 2018, while institutional ESG assets were on the order of \$2.2trn.
- In Japan, we expect 2020 to be the year when the equity market enters a period of full-scale proliferation of ESG-driven investment.

J.P. Morgan approach to ESG investing

- J.P. Morgan ESG indices (JESG) and our ESGQ scoring system have outperformed during the COVID-19 crisis, and we project assets tracking our suite of indices to reach \$20bn by year-end.
- We introduce new approaches for integrating ESG into macro investing and long-term strategies for hedging pandemics and climate risks.

In this report, we discuss the implications of COVID-19 on the sustainability agenda and provide an update on the latest ESG market developments and the new approaches to ESG investing. This report is part of our J.P. Morgan Perspectives series, which brings together views and analysis from across the broad scope of J.P. Morgan's Global Research franchise to look at big ideas and critical global issues transforming investment markets. We hope this series will both inform and foster public debate on evolving economic, investment, and social trends.

- Joyce Chang, Chair of Global Research

ESG and COVID-19: Friends or Foes?

- We view the COVID-19 pandemic as an accelerant that will drive the paradigm shifts set in motion after the 2008 Global Financial Crisis.
- Europe was a leader in sustainable finance pre-pandemic and continues to push for a green recovery...
- ...while the US appears likely to roll back environmental regulations and redirect resources to COVID-19 emergency services and away from climate resilience.
- COVID-19 has broadened focus beyond the 'E' (Environmental) factor, and the 'S' (Social) and 'G' (Governance) pillars will receive greater focus.
- In the US, the private sector is taking the lead in advancing ESG as corporates prioritize workers, customers, and communities in response to the pandemic.
- COVID-19 is accelerating the trend of stakeholder capitalism and challenging shareholder primacy.
- Further regulatory changes establishing more rigorous corporate governance requirements will likely be adopted in Europe.
- J.P. Morgan ESG indices (JESG) and our ESGQ scoring system have outperformed during the COVID-19 crisis, and we project assets tracking our suite of indices to reach \$20bn by year-end.
- We introduce new approaches for integrating ESG into macro investing and long-term strategies for hedging pandemics and climate risks.
- ESG integration approaches dominate in the US, whereas negative screening has the biggest share in Europe.
- Our European insurance team introduces an 'ESG-Score' using an integrated valuation approach.
- At the sector level, US alternative energy has become an unexpected ESG safe haven, while China renewables are a relatively defensive play against COVID-19 headwinds.
- In Japan, we expect 2020 to be the year when the equity market enters a period of full-scale proliferation of ESG-driven investment.

COVID-19 accelerates the paradigm shifts already set in motion

The COVID-19 crisis has not only brought on the greatest recession since WWII, but it is also an enormous stress test for globalization. The current crisis is giving ammunition to all sides of the debate, with multilateralist, authoritarian, populist and anti-China forces all citing the magnitude of this crisis as supportive of their views. While some argue that the COVID-19 crisis could be the straw that breaks the camel's back of globalization, others argue that it will usher in renewed focus on climate change and sustainability, turning the focus to the value of science and creating awareness on the impact of daily behavioral decisions to change outcomes.¹

We view the COVID-19 pandemic as an accelerant that will drive the paradigm shifts that were already in motion after the 2008 Global Financial Crisis (see [J.P. Morgan Perspectives: Paradigm Shifts: What Lies Ahead?](#), 5 April 2019). Last year, we outlined four paradigm shifts that will define markets and the global economy for years to come: 1) the decline in market liquidity; 2) the pivot to unconventional monetary policy; 3) the "great power" competition between the US and China; and 4) de-globalization and the rise of populism. The scope and speed of the Fed's actions to backstop financial markets highlight the degree to which the first two paradigm shifts have become the driving forces determining market function. The COVID-19 crisis is also amplifying the third and fourth paradigm shifts. US-China tensions are entering a new confrontational phase with the future balance of power potentially defined by who is most able to battle the pandemic and outperform. As governments adopt emergency measures to manage the crisis, decision-making is moving away from the global arena and to the state and national levels. As Jan Loeys notes in [The Long-term Strategist: Some Longer-term Consequences of Covid-19 Crisis](#) (April 9, 2020), global crises demand global cooperation and provide an opportunity to bring the world together. So far, we see more go-it-alone and close-the-border politics, adding to de-globalization forces that were already gaining momentum.

In our bi-annual J.P. Morgan Perspectives round-up on the current state of ESG, we discuss the implications of COVID-19 on the ESG agenda. Not surprisingly, there is a divergence of approaches across the globe to sustainability initiatives as policymakers focus on

¹ [How the World Will Look After the Coronavirus Pandemic](#), John Allen et al., Foreign Policy, 20 March 2020.

measures to revive economic growth and employment, with the goal to preserve as many solvent businesses as possible. **What has become clear, though, is that COVID-19 has broadened focus beyond the ‘E’ (Environmental) factor, and towards pandemic resiliency, represented by the ‘S’ and ‘G’ factors.** In past *J.P. Morgan Perspectives* publications, we have focused on the environmental factor of ESG—in particular, climate change (see [J.P. Morgan Perspectives: ESG Investing 2019: Climate changes everything](#), J. Chang et al., 30 May 2019 and [J.P. Morgan Perspectives: Climate Changes ESG Investing, Part II](#), J. Chang et al., 10 December 2019).

In this issue, we focus on the Social and Governance pillars and the transition by corporates to stakeholder capitalism over traditional shareholder primacy approaches. The COVID-19 crisis is shifting focus toward health and resiliency issues over the near term, and more resources will need to be devoted to supporting human capital and strengthening health systems. In 2020, J.P. Morgan expanded its dedicated ESG and Sustainability research capabilities, adding ESG and Sustainability specialists in both our Equity Research and Global Index Research groups. Our ESG European Equity Research team, led by Jean-Xavier Hecker and Hugo Dubourg, address the greater focus on Social and Governance issues through a series of recently launched primers and research notes (see [What happened to ESG?: Deciphering the complexity of a booming market](#), 6 March 2020; [Stay safe and think long term: DATA-Driven: COVID-19 likely to be a long-term catalyst for more balanced ESG investing](#), 30 March 2020; and [ESG Wire Research highlights - Week 15](#), 10 April 2020).

Since we launched our first guide to ESG investing in May 2018 (see [J.P. Morgan Perspectives: ESG Investing Goes Mainstream](#)), the Global Research team has produced over 300 reports assessing the macro and sector-level impact of climate change and outlining different approaches to integrating ESG into investment strategies. In addition, through J.P. Morgan ESG (“JESG”), a suite of indices we launched in 2018 that integrate ESG factors into a composite benchmark, we provide scoring coverage for over 4,500 global corporate issuers across 14 sectors and nearly 300 sovereigns and

quasi-sovereigns. Assets tracking the J.P. Morgan ESG (JESG) suite of indices now exceed \$13bn. The ESGQ quantitative metric for stock selection helps investors pick stocks that prioritize ESG factors and covers a universe of 5,124 stocks globally.

Could COVID-19 be a long-term catalyst for climate action?

The COVID-19 crisis will go down in history as the 21st century’s first sustainability crisis, and nowhere are the cross-currents from these paradigm shifts clearer than in the climate action arena. Multilateral forces and the European Union, in particular, see the COVID-19 crisis as a wake-up call that accelerates the need for transformative change to address climate change, highlighting the parallels between the two. Both have a global impact, and have arguably suffered from complacency until they become “problems of exponential growth against a limited capacity to cope.” In both cases, “if you wait until you can see the impact, it is too late to stop it.”² Climate economists such as Gernot Wagner argue that the COVID-19 pandemic replicates climate change at warp speed.³ Proponents of climate action hope to seize the moment as CO₂ emissions and pollution levels are in decline everywhere, pointing out that the crisis is leading to rapid adoption of greener and more environmentally friendly consumer behavior, and showing that effective action can be achieved quickly by altering individual behavior. There is now a clear understanding that collective action can change outcomes—in the case of the pandemic, practicing social distancing and following stay-at-home orders has been effective in flattening infection curves. Climate action proponents hope that the extreme measures to fight COVID-19 can be applied to global warming, arguing that the pandemic similarly requires action in a manner disproportionate to the current reality in order to forestall catastrophic consequences in the future.⁴ Moreover, the environmental results are also evident from the improved air quality as emissions are reduced.⁵ In Europe, S&P is projecting a 14% decline in EU greenhouse gas emissions this year, compared to only 8% at the time of the 2008 Global Financial Crisis.⁶ Even after the crisis is over, working from home and using videoconferencing tools will likely remain more prevalent,

² [Coronavirus Holds Key Lessons on How to Fight Climate Change](#), Beth Gardiner, Yale Environment360, 23 March 2020.

³ [Compound Growth Could Kill Us – or Make Us Stronger](#), Gernot Wagner, Project Syndicate, 18 March 2020.

⁴ Ibid. See footnote #2.

⁵ [What Covid Is Exposing About the Climate Movement](#), Michael Grunwald, Politico Magazine, 21 April 2020.

⁶ [The EU’s Drive For Carbon Neutrality By 2050 Is Undeterred By COVID-19](#), Marion Amiot et al., S&P Global, 29 April 2020.

reducing the need for transportation and the resulting emissions.

[Mackie and Murray](#) discuss the impacts of climate change and note that if no new policies are enacted relative to what was legislated in 2017, this would likely mean a global temperature increase of around 3.5°C at the end of the century relative to pre-industrial times. [Murray](#) highlights that women face elevated risks from natural disasters—the frequency and intensity of which will be greater under climate change—as well as in their unique exposure to natural resources. Gender-responsive climate policy can help narrow these gender gaps in the face of climate change. Central banks may also have a role to play to help manage climate change ([Mackie and Murray](#)).

The European Union’s (EU) commitment to carbon neutrality by 2050 remains unchanged and even appears to be accelerating from some corners. Prior to the COVID-19 pandemic, achieving carbon neutrality by 2050 was a top EU priority with ambitions to set the future global ESG standard. The EU is now debating even more ambitious targets, with proposals to move from a proposed 40% reduction in emissions from 1990 levels over the next decade, to as much as a 50% reduction. A number of proposals call for adding environmental objectives to the potential recovery funds under discussion and requiring public investment in green infrastructure. The consultation period ends on June 23, 2020.⁷ In addition, climate and environmental ministers from 17 EU countries (Austria, Denmark, Finland, Italy, Latvia, Luxembourg, Netherlands, Portugal, Spain, Sweden, France, Germany, Greece, Slovak Republic, Ireland, Slovenia, and Malta) collectively signed an [open letter](#) urging for the adoption of a “Green” recovery plan, as “we cannot afford setbacks that can have detrimental effects on our climate, biodiversity and environment as well as on human health and our economies.” The EU’s Green Deal envisions a recovery that will “build the bridge between fighting Covid-19, biodiversity loss and climate change.”⁸ The Green Deal outlines a new growth strategy for the EU that delivers on the twin benefits of stimulating economies and creating jobs while accelerating the green transition in a cost-efficient way. In June 2021, the European Commission will review and propose revisions to existing legislation relevant to the Green Deal.⁹

Complementary to state ministers, the European Parliament launched a “Green Recovery Alliance” on April 14, at the initiative of Pascal Canfin, a French Member of the European Parliament (MEP) who chairs the European Parliament’s committee on environment and public health. This alliance brings together 79 MEPs from various political affiliations, as well as businesses, business associations, trade unions, NGOs, and think tanks. In our view, this highlights that the call for a “green” recovery is going mainstream in Europe and is being shaped above traditional political divisions (see [ESG Wire: Research highlights - Week 16](#), Jean-Xavier Hecker and Hugo Dubourg, 16 April 2020).

However, the support for climate action in the time of COVID-19 is far from universal. Due to the pandemic, the UN has postponed the 2020 Climate Change Conference (COP26) that was scheduled to be held in November.¹⁰ Even in Europe, the prioritization of pandemic measures may delay climate policies. Some EU countries have not been able to submit their National Energy and Climate Plans (NECPs) to the European Commission as they have been dealing with the pandemic. Poland and Czech Republic, the worst performers in the EU in terms of GDP per unit of CO₂, have pushed for a delay to the EU’s commitment to achieving carbon neutrality by 2050.¹¹ In addition, the European Automobile Manufacturers’ Association (ACEA), European Association of Automotive Suppliers (CLEPA), European Tyre and Rubber Manufacturers Association (ETRMA), and European Council for Motor Trades and Repairs (CERCA) have signed an open letter to the president of the European Commission asking for a delay to climate-change mitigation and protection of the environment laws due to COVID-19. S&P notes that given that the automotive sector is one of the most important in the EU, employing around 14 million people, these industry bodies might have some leverage.¹²

US companies prioritizing stakeholders over shareholders and assuming the lead for ESG

The debate around climate change in the US is taking a vastly different tone as the costs of COVID-19 escalate, and resources are being redirected to emergency services and away from climate resilience. In the midst of the COVID-19 crisis, the US Environmental Protection Agency (EPA) reduced fuel

⁷ Ibid. See footnote #6.

⁸ [European Green Deal must be central to a resilient recovery after Covid-19](#), Climate Home News, 9 April 2020.

⁹ Ibid. See footnote #6.

¹⁰ [Key COP26 climate summit postponed to ‘safeguard lives’](#), UN News, 2 April 2020.

¹¹ Ibid. See footnote #6.

¹² Ibid. See footnote #6.

economy and emissions standards for the auto industry¹³ and temporarily loosened enforcement of some environmental compliance obligations if COVID-19 was the cause of the noncompliance.¹⁴ In addition, officials in San Francisco, Miami Beach and New York City have said they are likely to delay climate-related projects like sea walls due to the increased demand for COVID-19 emergency services.¹⁵ On the legislative side, we have seen some House Democrats attempt to maintain their focus on climate change, with Rep. Jamie Raskin (D-Md.) noting that the response to the pandemic amounted to “a dress rehearsal for addressing the catastrophic impacts of climate change.”¹⁶ However, a Democratic proposal to tie aid for airlines to emission reductions in the CARES Act was ultimately removed,¹⁷ and we think that if a divided government remains in place after the 2020 elections, then the chance of significant green stimulus legislation being passed remains low. Republican strategists have countered that the economic fallout of COVID-19 is a preview of life under ambitious climate change policies such as the Green New Deal championed by Alexandria Ocasio-Cortez (D-NY) and Bernie Sanders (D-VT) and loosely supported by presidential candidate Joe Biden.¹⁸

However, the economic toll from the COVID-19 crisis is catalyzing changes in corporate behavior, accelerating the transition from the old paradigm of shareholder primacy—that corporations exist principally to serve shareholders—to a new and evolving form of stakeholder capitalism. The seeds for this transformation were in motion well before the COVID-19 pandemic, as the rise in populist forces and the focus on income inequality were already shifting the social contract between businesses, policymakers, and the public. The COVID-19 crisis illustrates the limitations of government decrees and market incentives, as the behavior of the community will dictate the future path of the crisis.

COVID-19 has accelerated the trend toward stakeholder approaches to investment over shareholder primacy. This trend began with the Business Roundtable’s release of a new Statement on the Purpose of a Corporation on August 19, 2019, which was signed by 181 CEOs who represent \$5trn in annual revenue and nearly one-third of the total value of the US stock markets and account for more than 40% of all corporate income taxes paid to the federal government.¹⁹ The new statement of corporate purpose focuses on the need to lead their companies for the benefit of all stakeholders, encompassing customers, employees, suppliers, communities and shareholders.²⁰ On April 14, 2020, the Business Roundtable released essential guidelines to restart the economy that focus first on protecting workers, customers, and communities, reinforcing the shift to stakeholder capitalism.²¹

The investor community has outlined similar views in many of their 2019 and 2020 annual shareholder letters, with BlackRock, Vanguard and State Street—the “Big Three”—which hold around 25% of voting power across the S&P500, committing to incorporate sustainability considerations into their investment framework and products. BlackRock has placed sustainability at the center of its investment approach and sees an inflection point for the adoption of global sustainable ETFs and index funds, projecting that many investors will rotate out of traditional funds and into sustainable ones, with \$1trn of new assets poised to invest in sustainable ETFs and index funds by the end of this decade.²²

In Asia, we see mixed prospects for ESG over the near term. Not surprisingly, environmental restrictions have been relaxed in China, but China will not abandon its green economy objectives as they are important to retain the support of the urban population ([Lai, Hon, Tsui, and Darling](#)). In Japan, we expect 2020 to be the year when the equity market enters a period of full-scale

¹³ [U.S. DOT and EPA Put Safety and American Families First with Final Rule on Fuel Economy Standards](#), U.S. Environmental Protection Agency, 31 March 2020.

¹⁴ [Memorandum: COVID-19 Implications for EPA’s Enforcement and Compliance Assurance Program](#), Susan Parker Bodine, U.S. Environmental Protection Agency, 26 March 2020.

¹⁵ [Here’s How Coronavirus Could Raise Cities’ Risk for Climate Disaster](#), Christopher Flavelle, The New York Times, 23 April 2020.

¹⁶ [Pandemic scrambles House Democrats’ election-year agenda](#), Sarah Ferris and Heather Caygle, Politico, 16 April 2020.

¹⁷ [\\$2tn US coronavirus relief comes without climate stipulations](#), Emily Holden, The Guardian, 26 March 2020.

¹⁸ [G.O.P. Coronavirus Message: Economic Crisis Is a Green New Deal Preview](#), Lisa Friedman, The New York Times, 7 May 2020.

¹⁹ [Effective Leadership on the World Stage: CEO Memos to Congress](#), Business Roundtable

²⁰ [Business Roundtable Redefines the Purpose of a Corporation to Promote ‘An Economy That Serves All Americans’](#), Business Roundtable, 19 August 2019.

²¹ [Business Roundtable CEOs Created Guidelines for Reopening the Economy – We’ll be Tracking Which Companies Prioritize a Stakeholder Approach to the Recovery](#), Amanda Keating, JUST Capital, 15 April 2020.

²² [Reshaping Sustainable Investing](#), Philipp Hildebrand et al., iShares, BlackRock.

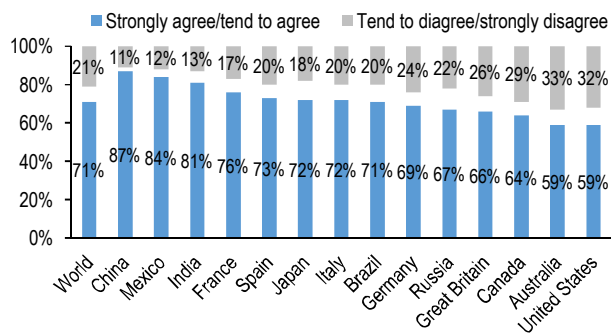
proliferation of investment driven by the ESG theme ([Sakagami and Ueda](#)).

Greater competition for resources despite strong public support for climate action

A recent Ipsos survey across 14 countries showed that a majority of respondents believe that climate change is as serious a crisis as COVID-19. However, there is considerable dispersion across countries (Figure 1).

Figure 1: Across 14 countries, 71% of people believe that climate change is as serious a crisis as COVID-19...

Responses to the Ipsos survey question "To what extent do you agree or disagree with the following: In the long term, climate change is as serious a crisis as COVID-19 is?"; %

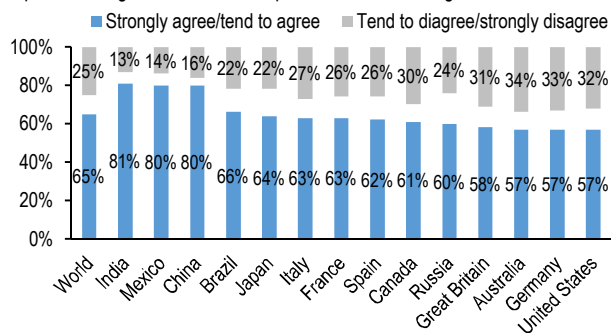


Note: Base: 28,039 online adults aged 16-74; Fieldwork dates: Friday 17 to Sunday 19 April 2020.

Source: Ipsos (see footnote #23)

Figure 2: ...and 65% believe that climate change should be prioritized in the economic recovery, but the US lags in these beliefs

Responses to the Ipsos survey question "To what extent do you agree or disagree with the following: In the economic recovery after Covid-19, it's important that government actions prioritize climate change?"; %



Note: Base: 28,039 online adults aged 16-74; Fieldwork dates: Friday, 17 to Sunday, 19 April 2020.

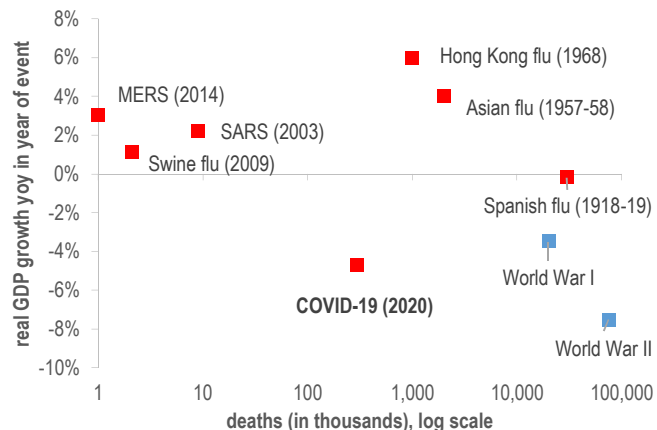
Source: Ipsos (see footnote #23)

In China, 87% agreed with this statement, while at the other end of the spectrum, only 59% of Americans felt the same way. Similarly, although 65% of world respondents felt that it's important to prioritize climate change in the recovery, only 57% of Americans agreed (Figure 2).²³

Irrespective of public support for climate action, the immediate reality is that preventing COVID-19 from becoming a more deadly pandemic has made it instead one of the most destructive economic events, with the pandemic striking first among the 21st century swans ([Normand](#)). Figure 3 illustrates that the unprecedented stoppage in global activity in response to the outbreak is causing a contraction that exceeds the 2008 Global Financial Crisis and World War I, which coincided with the Spanish flu pandemic.

Figure 3: Preventing COVID-19 from becoming a more deadly pandemic made it instead one of the most destructive economic events in over a century

Total fatalities and peak-to-trough changes in global real GDP during five worst respiratory epidemics of past century plus two World Wars



Source: J.P. Morgan

The dramatic interruption of activity across nearly the entire globe is expected to generate an unprecedented 10% decline in global GDP in 20Q2 from 19Q4. While we forecast a ~10% rebound by Q4 of this year from the low in Q2, at that point the world economy should still be about 2.5% below its level at the end of last year. We do not see the global economy reaching its level of Q4 of last year until the second quarter of next year. The true costs of a recession are the lost production and incomes during the period of below-potential output. We estimate the cumulative cost of recession based on our forecasts through the end of 2021 at an overall loss of 8% of global

²³ [Two thirds of Britons believe Climate Change as serious as Coronavirus and majority want Climate prioritised in economic recovery](#), Kelly Beaver, Ipsos, 21 April 2020.

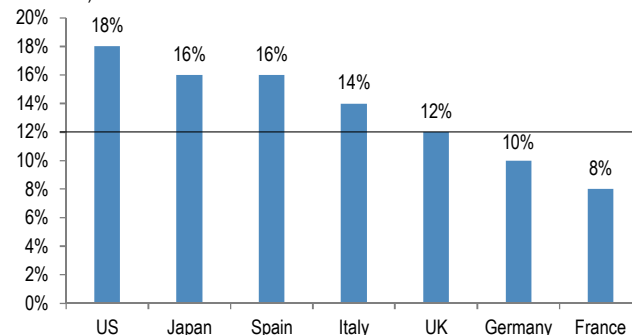
GDP. We project global profits to experience a roughly 70% peak-to-trough decline in the current quarter from a year ago. Even with a projected strong subsequent rebound, global profits are expected to stand 20% below their forecasted pre-pandemic level at the end of next year. We are forecasting a 15% to 20% rise in public sector debt, while the US, Euro area, Japan, UK and China will all post double-digit deficits through 2021.

Despite a synchronized global downturn, the labor market outturns vary widely with the US delivering historic leaps in unemployment compared to Europe (see [Global Data Watch](#), B. Kasman et al., 8 May 2020). Our economists forecast that the Euro area, UK and Sweden will experience an unemployment rate rise of around 3%-pts this quarter, while the US unemployment rate has already moved up by more than 11%-pts from the low in February to reach 14.7% in April, with our US economists estimating that labor compensation will decline at a 58% pace this quarter. Given the scale of US job and income losses, there will be little appetite in the US to condition financial support on making fundamental green changes. As Jean Pisani-Ferry, nonresident senior fellow at the Peterson Institute for International Economics, notes, “Today is for firefighters, not architects.”²⁴

The longstanding negative correlation between public concerns about the environment and about the economy could increase if the COVID-19 crisis is prolonged.²⁵ Around 36% of the OECD population would be at risk of falling into poverty if they had to forgo three months of their income. With 12% of the OECD population already living in relative income poverty (Figure 4), and despite significant fiscal and monetary support, the COVID-19 crisis could create a level of social distress not seen in developed economies for decades. Although citizens of EM countries appear to be very concerned about the severity of the climate change crisis, with the vast majority believing that climate change should be prioritized in the recovery, EM countries may be the least able to carry out a green recovery. The IMF now projects that more than 170 countries will have negative per capita income growth this year compared to a

prediction of positive income growth for over 160 countries just four months ago.²⁶

Figure 4: 12% of the OECD population lives in relative poverty
% of the population living in relative income poverty (using the OECD definition)



Source: OECD “How’s Life?” Database, J.P. Morgan

Rise of the ‘S’ (Social) and ‘G’ (Governance) pillars in ESG

We believe that the Social and Governance pillars will gain greater prominence in ESG methodology post-pandemic. The economic toll from the COVID-19 crisis is catalyzing changes in corporate behavior, accelerating the transition from the old paradigm of shareholder primacy—that corporations exist principally to serve shareholders—to a new and evolving form of stakeholder capitalism. At the same time, investor focus is shifting towards social and governance issues, leading to a more balanced ESG approach as opposed to the previous Environmental focus. Capital allocation and resilience dominate corporate governance consideration at present, but in the long-run, the inclusion of social and societal issues will increase in response to the human capital issues related to workers, customers and communities from the current crisis ([Hecker and Dubourg](#)). In addition, our recent ESG investor survey suggests that the COVID-19 crisis will likely result in a better integration of long-term sustainability risks, improving the prospects for ESG investing ([Hecker and Dubourg](#)).

Social funds account for a relatively small component of ESG markets. S&P reports that the social bond market, which funds projects with a positive social impact, grew to \$12.71bn in 2019 from \$11.19bn in 2017. In comparison,

²⁴ [Building a Post Pandemic World Will Not Be Easy](#), Jean Pisani-Ferry, Project Syndicate, 30 April 2020.

²⁵ [Sorry, but the Virus Shows Why There Won’t Be Global Action on Climate Change](#), Jason Bordoff, Foreign Policy, 27 March 2020.

²⁶ [Confronting the Crisis: Priorities for the Global Economy](#), Kristalina Georgieva, International Monetary Fund, 9 April 2020.

the green bond market, which targets environmentally friendly projects, reached \$254.9bn in 2019, a 49% year-over-year increase.²⁷

Even if the introduction of regulatory standards stalls, we expect the COVID-19 crisis to accelerate the shift towards long-term, stakeholder value types of reporting in ESG reporting frameworks for corporates. Large listed corporations, particularly those receiving COVID-19 emergency assistance, will likely be compelled to reduce buybacks, cut dividends, and reduce the compensation of top executives. In the medium term, we expect the focus for disclosure to center on capital allocation, executive compensation, employee support, value chain support, societal contribution and long-term environmental strategies. This will likely drive the need to improve ESG reporting on supply chains. Over the longer term, “integrated reporting” or sustainable accounting frameworks could be introduced ([Hecker and Dubourg](#)).

In Europe, the EU regulatory framework on sustainable finance could play a key role in the region’s recovery with international implications. In the 10-point EU action plan on sustainable finance, one of the key objectives is to foster sustainable corporate governance and attenuate short-termism in capital markets. Regulations are crucial catalysts for determining the financial materiality of ESG factors and developing the ESG market ([Hecker and Dubourg](#)).

Beyond climate change, Europe continues to lead the way in the broader ESG agenda and advancing gender equality, with the Council of Europe (CoE) implementing a Gender Equality Strategy to address structural barriers to equality ([Murray and Marney](#)). The global movement to improve gender equality continues to gain momentum, with advances in women’s participation in the labor force, representation on corporate boards, and in the political arena, but challenges remain. Over the past year, female representation on corporate boards has increased, while the representation of women in CEO-level positions is little changed and remains low in the mid-single digits ([Harano and Barker](#)). The gender pay gap remains persistent even though women tend to exhibit higher levels of educational attainment ([White](#)).

ESG market developments and performance

Growing interest in ESG investing and diversification of approaches and product offerings

Using the broadest classification, assets following sustainable investment approaches and guidelines have risen to around \$45trn in 2020, with ESG investing expanding in the US and Asia and moving beyond active equity management ([Hecker and Dubourg](#)). [Hecker and Dubourg](#) review the investment strategies, which fall under seven different ESG strategies: Negative / Exclusionary Screening, ESG Integration, Corporate Engagement and Shareholder Action, Norms-based Screening, Positive / Best-in-class Screening, Sustainability-themed Investing, and Impact / Community Investing. ESG integration and negative screening are the favored investment approaches, with ESG integration the fastest growing large-scale strategy. ESG integration dominates in the US, whereas negative screening has the biggest share in Europe. ESG momentum strategies are now shifting from “responsible” to “sustainable” investment approaches. ESG strategies are non-exclusive, and “responsible investment” requires a combination of ESG integration and Active Ownership.

[Panigirtzoglou and Inkinen](#) consider a much narrower definition of ESG investment, defined as the active and systematic universe, and they estimate that retail ESG assets (proxied by the fund universe with ESG-related attributes) were on the order of \$720bn in 2018, while institutional ESG assets were on the order of \$2.2trn. In addition, they proxy the pace of ESG adoption by the difference between the AUM growth of ESG-focused funds and the AUM growth of the overall fund universe, and they find the strong pace of ESG adoption during 2019 does not appear to have spilled over into 2020.

Across asset classes in the ESG universe, securitized products, thus far, lag corporates and equities, where there are various company/sovereign ESG ratings/scores provided by third-party providers.

However, we believe ESG is set to gain further momentum and adoption across securitized product stakeholders through 2020. Currently, with no standardization around ESG data/analysis and no third-party ESG scores, each investor has different areas of focus and approaches to vet investments against their own set of ESG criteria for securitized products. We believe the securitized products community should develop a

²⁷ [Corporate, investor attention pivots to the S in ESG](#), Jennifer Laidlaw, S&P Global, 28 January 2020.

standard ESG dataset/framework, comprising of basic/common measurable ESG metrics that issuers can voluntarily report ([Sim et al.](#)).

J.P. Morgan approach to ESG Investing

J.P. Morgan's ESG indices and ESGQ stock selection framework have outperformed their respective baselines so far in 2020. Reduced exposure to commodity-heavy sectors limited some of the downside risk from the collapse of oil and other commodity prices.

Beyond J.P. Morgan's products, Morningstar tracks 206 sustainable open-end funds and ETFs and reports that sustainable funds outperformed in the first quarter, with 70% ranked in the top halves of their respective categories and 44% in the top quartile, versus 11% in the bottom quartile. Virtually all ESG index funds outperformed their conventional benchmarks because they were underweight energy, the worst-performing sector this year.²⁸

Assets benchmarked to JESG indices expected to reach \$20bn by year-end

Our Index research team ([Bhat et al.](#)) finds that J.P. Morgan ESG Index Suite (JESG) indices have, without exception, mimicked the performance and risk-reward characteristics of their respective baseline indices since their inception over seven years ago, debunking the myth of ESG underperformance. In addition, the multi-dimensional approach to incorporating ESG has helped JESG indices score a lot higher than their respective baseline counterparts on ESG metrics.

The JESG suite of indices now have more than \$13bn in assets benchmarked to them. In April 2018, J.P. Morgan launched the ESG Index Suite (JESG) with the introduction of the JESG suite of emerging market bond indices. Our ESG Global High Yield Corporate Index (JESG GHYCI) and Asia Credit ESG Index (JESG JACI) were later launched in 2019. Assets benchmarked to the standard and customized version of the JESG indices are expected to surpass \$20bn by the end of the year. Europe has a disproportional share of assets currently benchmarked to the family, also driven by the stronger regulatory framework in the region. We have not heard of ESG funds being impacted by outflows as

clients are seeking to create new ESG-aligned funds due to their defensive resilience and in order to build a 3-5 year track record to attract sustainability-focused assets in the future.

The J.P. Morgan ESG (JESG) methodology is novel as it aims to bring about standardization in fixed income ESG investing by using a multidimensional approach, incorporating several of the above ESG investment approaches into one single benchmark, including:

- **ESG Integration:** overweighting stronger ESG performers and underweighting weaker ones.
- **Positive/Best-In-Class Screening:** removing those issuers that are in the lowest quintile of relative ESG performance.
- **Sustainability Themed Investing:** overweighting green bonds compared to their conventional bond counterparts issued by the same issuer.
- **Ethical/Exclusionary Screening:** excluding those issuers with any direct revenue exposure to controversial sectors such as Weapons, Tobacco, or Thermal Coal.
- **Norms-Based Screening:** excluding those issuers that are found non-compliant with The Ten Principles of the UN Global Compact.

ESGQ stock selection framework outperformed during the COVID-19 sell-off

J.P. Morgan's ESGQ stock selection framework and ESG dimensions outperformed during the COVID-19 induced crash, strengthening the rationale for investing in ESG strategies ([Chaudhry](#)). The JPM ESGQ is a proprietary stock selection metric with eight dimensions that helps investors pick stocks in a responsible way. ESGQ is constructed using three building blocks.

- 1) **Stability in ESG scores by using slow moving and infrequent data variables** that capture the long-term corporate responsibility profile of a company, and couples these scores with:
- 2) **Faster moving ESG data that isolate news flow on potential controversies.**

²⁸ [Sustainable Funds Weather the First Quarter Better Than Conventional Funds](#), Jon Hale, Ph.D., CFA, Morningstar, 3 April 2020.

3) Momentum from these scores captures changes in investor sentiment and price behavior.

Our Macro and Quantitative research team have back-tested the ESG datasets throughout this period of market turbulence and find that highly rated ESG stocks generally had low stock price volatility and suffered lower draw-downs (peak-to-trough falls). During the US equity sell-off, ESG strategies showed broadly flat performance for excess long screens, and had significant gains on a long versus short basis (approximately +10%). On average ESGQ longs saw their prospective P/Es fall by 18%, and stock prices fell by 26% during Q1 (peak to trough). Governance and Social factors have also appreciated more than the Environmental long/short.

New approaches to integrating ESG into macro investing

Investor demand for frameworks to measure country-level ESG performance and risk has risen considerably over the past few years, and [Manicardi and Normand](#) introduce an updated framework for integrating ESG into macro investing. The key highlights from the latest update to their ESG scorecard include: a) positive trends in Environmental and Social criteria remain broad-based and firmly in-place; b) convergence of EMs to DMs persists and displays no signs of slowing; and c) minimal adjustments to the league table in line with the multi-year nature of ESG trends. The cross-sectional regression results of the latest ESG factors on returns are strongest for spreads and seem marginally better for the Social and Governance pillars. But a few caveats make them stick to the original conclusions that **the Environmental measure remains the most tradable pillar and that equities are the best vehicle for expressing ESG views in macro markets.**

Long-term hedging strategies for pandemics and climate-related catastrophes

[Normand](#) assesses the best long-term hedges for existential threats like pandemics or climate-related catastrophes. He argues that the reluctance to build resilience until a catastrophe crystallizes a wildcard is understandable given the scarce resources of most governments, corporates or households, but a focus on the near rather than the long term can also mistake a baseline for a tail risk. **The best long-term hedges for US exposure from a growth shock from a climate catastrophe are the yen, Gold and Quality stocks,** since the hedge value of Bonds has fallen as 10Y yields approach the zero bound and Equity/Bond correlations collapse. For European and Japanese exposure, Bonds hold even less value, because rates are lower across the curve than in the US. Shorting the currency is the better

option for a growth shock. The best disaster insurance for EM economies is also long USD exposure, particularly now that cash rate differentials to the USD (hedging costs) are record-low in all regions and sub-5% in all but three countries (Turkey, Mexico, Russia).

Sectoral developments and company impacts

We take a fundamental look at 10 key sectors across the US, Europe, and Asia and assess their ESG positioning during the COVID-19 crisis.

In the US Alternative Energy space, [Coster and Strouse](#) note that manufacturing and supply-chain disruption, which started in February, continues to impact upstream production of solar panels, wind turbines and blades, but the COVID-19 pandemic is now impacting near-term sales, particularly in the small-scale solar rooftop end-market where social distancing impedes door-to-door marketing, system installations, and new home construction. Their Top Long Ideas for 1H2020 are First Solar (FSLR) and TPI Composites (TPIC), while for the COVID-19 recovery phase their Top Long Ideas are Enphase (ENPH), SolarEdge (SEDG), Sunrun (RUN) and Sunnova (NOVA).

[Garrido and Mahbubani](#) see a near-term buying opportunity for European Utilities, as they believe the average share price correction since the start of the COVID-19 crisis is overdone, when taking into account both ESG and cost of capital considerations. Their proprietary model shows that European Utilities should have seen a 26-33% P/E re-rating since end-2016, with 11% contributed by the lower cost of capital linked to lower bond yields and 15%-22% due to the positive impact of environmental investments on cost of capital, growth potential and margins. Electricity networks should contribute the lion's share of such re-rating, as their model justifies a 31-43% re-rating of this business due to ESG.

[Willi](#) discusses smart and efficient building opportunities. He argues that economics, regulation and corporate ESG will drive carbon reduction in buildings. Principally, there are two ways to reduce a building's emissions. First, investments into the building make it more energy efficient and smarter, thereby reducing energy needs. Second, fossil fuels can be replaced by other forms of energy, chiefly through electrification of processes historically powered by oil and gas.

Insurance has an important social purpose to facilitate the atomization of risk, and insurance-specific ESG considerations are captured by the two sides of the balance

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sheet. Granular analysis of insurers' ESG disclosure allows us to evaluate relative performance and derive an "ESG-Score" out of 20 by company. We introduced an integrated valuation approach, "ESG10/20," which combines our fundamental analysis and ESG-Score to arrive at an adjusted valuation for European Insurance ([Morris](#)).

In Asia, our China autos team developed an evaluation system to assess all OEMs' ESG scores using 11 criteria. Geely leads the pack, followed by BYD and Great Wall. Our deep-dive into China wind operators indicates that renewables have higher dispatch priority and thus are relatively defensive against COVID-19 headwinds. For our Asia energy coverage, selected companies (with OW/N ratings) which show an improvement in ESG focus are LG Chem, Woodside, TOP, GAIL, SPC and COSL ([Lai, Hon, Tsui, and Darling](#)).

In Japan, we expect 2020 to be the year when the equity market enters a period of full-scale proliferation of investment driven by the ESG theme. The balance of sustainable investment in Japan has risen sharply in recent years, but the scope for further growth looks substantial as the level remains low compared with other countries. [Sakagami and Ueda](#) note there is a notable bias in terms of size, with high-ESG stocks dominated by large-caps and low-ESG stocks consisting mainly of small/mid-caps. A review of the performance of stocks selected based on a combination of ESG score and ROE showed that performance greatly exceeded those based on ESG score or ROE alone. Within the Japan Machinery sector, [Sano et al.](#) recommend Daikin Industries (6367, OW) as their Top Idea.

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Will COVID-19 will be a long-term catalyst for ESG?

- **Our recent investor survey suggests that the COVID-19 crisis, as the 21st century’s first “Sustainability” crisis, is likely to result in a better integration of long-term sustainability risks.**
- **Over the long run, investors believe the COVID-19 crisis will be a potential catalyst for ESG investing.**

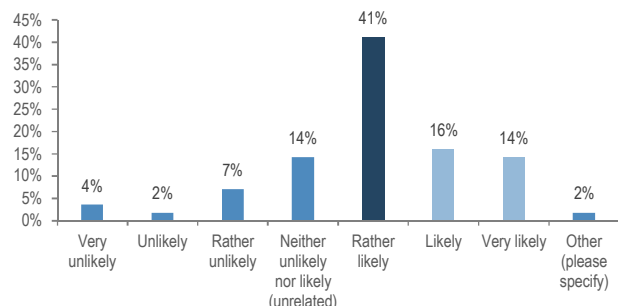
The COVID-19 crisis is likely to result in better valuation of long-term risks

According to the results of an investor survey with 56 respondents from 50 global institutions, representing a total of \$12.9trn of AUM, the COVID-19 crisis, as the 21st century’s first “Sustainability” crisis, is likely to result in a better integration of long-term sustainability risks.

Indeed, 71% of respondents responded that it was “rather likely,” “likely,” or “very likely” that the occurrence of a “low probability / high impact risk” such as COVID-19 would increase awareness and actions globally to tackle “high impact / high probability” risks such as those related to climate change and biodiversity losses.

Figure 1: Increased action on climate change is rather likely after COVID-19

Distribution of responses to Question 9 in our investor survey: How likely is the occurrence of a “high impact / low probability” global risk (i.e., COVID-19 pandemic) to increase awareness and actions globally to tackle “high impact / high probability” risks such as climate change and biodiversity losses?



Source: J.P. Morgan, Results from the survey “Tracking the ESG implications of the COVID-19 Crisis”

We note, however, that the significant share of respondents (41%) opting for the “rather likely” option highlights the very high level of uncertainty in the short

and medium term, with regard to both policy and market responses.

We believe that pandemics and environmental risks are viewed as similar in terms of impact, representing an important wake-up call for decision makers. The impacts of the COVID-19 crisis on the real economy and the financial system highlight the limits of most forecasting models, which do not deal well with non-linear, complex systemic risks. We believe it will shift the focus towards resiliency and to socio-economic scenarios required to avoid worst-case impacts.

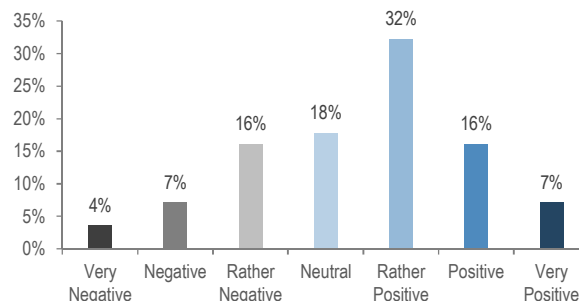
In our view, such tools will increasingly be used by the most advanced and mature ESG investors, as part of their ESG investment strategies.

The COVID-19 crisis is perceived as a potential catalyst for ESG investing

As action and awareness on long-term sustainability risks are likely to increase in the longer run in the aftermath of the COVID-19 crisis, this should be a positive catalyst for ESG. This opinion was shared by the majority (55%) of the respondents to our investor survey, which see it as a positive catalyst in the next three years. Only about a quarter (27%) of investors expect a negative impact, while 18% believe it will be neutral.

Figure 2: Investor expectations of the impact of the pandemic on ESG have a positive skew

Distribution of responses to Question 6 in our investor survey: “In your view, what will be the implications of the COVID-19 crisis for ESG investment momentum in the next 3 years?”



Source: J.P. Morgan, Results from the survey “Tracking the ESG implications of the COVID-19 Crisis”

The positive skew of expectations contrasts with the intuition that times of crisis shift the focus towards short-term economic and financial issues. Yet, it is important to note that the question specifically mentioned a time horizon of three years. Investors, therefore, are likely to differentiate between a potential negative impact in the

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next few weeks/months and a positive impact in the longer run.

Existing ESG Know-How seen as a commercial differentiator

The COVID-19 crisis will likely affect the models used by investors to evaluate ESG credentials and the performance of companies. It will also affect the way companies manage and communicate their performance on E, S, and G issues.

We think that these changes will be best captured as part of issuers-shareholders dialogue, providing mature “ESG” investors with an early-mover advantage, as they will be able to leverage existing IP and human resources to improve the quality of this dialogue.

Beyond the mix of ESG strategies within investment strategies, existing resources and overall credentials are likely to be a commercial differentiators in an increasingly competitive ESG market.

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Increased focus on Social and Governance pillars in aftermath of COVID-19 crisis

- **COVID-19 is the 21st century's first sustainability crisis, shifting investor focus towards social and governance issues and leading to a more balanced ESG approach over the previous Environmental focus.**
- **Capital allocation and resilience dominate short-term corporate governance priorities. But in the long run, the inclusion of social and societal issues into corporate governance is likely to be fostered by the crisis.**
- **Companies are adapting their operations to a new world that values greater support for stakeholders over shareholders. Companies will be expected to contribute to societal demands in response to growing political and social risks.**

COVID-19 is the 21st century's first sustainability crisis

The "Global COVID-19 Crisis" ("GCC"), contrary to the Global Financial Crisis (GFC), is not a financial crisis, but a systemic crisis originating from a biological hazard. It has massive health, economic and social implications in the short term, and some of these impacts are likely to develop in the medium and long term. As such, the GCC appears as the 21st century's first sustainability crisis. Yet, we believe there is a glimmer of hope. These unprecedented times require bold public and private actions, along with new tools as well as global collaboration. The GCC could be a catalyst towards more resilient and sustainable societies, in order to tackle climate change, the other "gray rhino" lurking.

While the environmental parallel is tempting, we should not dismiss the profound social and governance implications of the crisis. The GCC could act as a wake-up call for increased action against climate change, but in the short term, it is increasing the focus on social and governance factors. Most importantly, we believe that the crisis highlights the holistic nature of sustainability risks. A transition to a low carbon and circular economy implies a social acceptance of this transition, as well as governance changes for firms to embrace this structural shift.

Governance implications

Short term: Delays in AGMs and changes in capital allocation are the main point of attention

The short-term corporate governance implications are delays to Annual General Meetings (AGMs), and changes in capital allocation while long-term impacts will focus on resilience.

We are in the midst of AGM season and the physical restrictions on physical gatherings implemented in a number of countries are preventing companies from holding their AGMs as before. National regulations, such as in Germany, stipulate that a physical shareholder gathering has to be held, preventing local companies adopting a digital format. This has direct implications for the life of companies as AGMs are usually charged with approving the annual accounts, approving the remuneration of top executives, as well as allocating the added value created. This last point forces some companies to delay the payment of their dividends until a physical AGM is held.

While dividend cuts can represent a short-term financial risk for yield-focused investors, there are also financial and reputational risks associated with unchanged distributions to shareholders (dividend or share repurchase) in the context of an undermined economic outlook. The European Banking Federation (EBF) stated that European Banks should halt 2020 dividend payments to preserve capital and keep lending to businesses and households until the outlook is clearer. The capital allocation policy has to be adapted to ensure business continuity.

Medium term: Resilience and governance effectiveness will be the focus

Resilience came up as the second most mentioned ESG topic mentioned by investors in our survey, highlighting the large consensus around strong governance credentials and the ability of businesses to manage a crisis (see [Stay safe and think long term](#), J. Hecker et al., 30 March 2020).

As a significant part of the global population is in lockdown, firm decision-making could be directly impacted as the chain of command is disrupted by the illness or inability of key personnel to ensure the continuity of business. Allowing business continuity, i.e., supporting clients while ensuring the wellness of employees and stakeholders, including suppliers, is a reason for governance policies that clearly state

responsibilities, as well as having contingency measures should one decision-maker be unable to act.

Importantly, resilience is a moving concept, and a new or increased area of focus is appearing following the emergence of new financial, regulatory, or sustainability risks. In particular, cybersecurity will likely emerge as a focus, as increased levels of remote working are creating new vulnerabilities. According to Verizon, 94% of all global malware is delivered via email, and widespread remote working will likely increase the overall volume of email. In conclusion, “good” governance measures are designed to ensure business resilience and continuity. Clear policies, processes and controls and fair and transparent dialogue among stakeholders are critical and are the best corporate protection against this crisis and the next.

Long term: Stakeholderism as the new zeitgeist

In the long term, we expect the GCC to foster the assessment of business decisions in a broader context, and in particular regarding capital allocation. European governments including France and Germany stated that no dividend should be paid by companies benefiting from public support.

Beyond the specific issue of government support, a growing number of investors are assessing the sustainability and equity of corporate distribution policies and executive remuneration in a context broader than shareholder primacy. We believe increasing scrutiny regarding the sustainability of distribution policies is part of a structural shift encompassing investors, politicians as well as civil society, and that can only be fostered in the context of an economic and social crisis.

This will have concrete impacts for companies seeking governmental support. In fact, the American CARES Act sets a two-year total compensation cap for executives and employees of firms entering into a loan or loan agreement with the US Treasury. Interestingly, the CARES provision is bringing back the idea of a maximum socially acceptable level of pay in the US.

The focus on executive compensation level is not new. As part of the Dodd-Frank Act, a “CEO pay ratio”—the ratio between the CEO remuneration and the median employee remuneration—has been disclosed by US firms since 2018. The ratio is also spreading across

Europe and disclosed notably in the UK this year. The takeaway is that societal issues, such as inequality, are increasingly entering the scope of corporate governance, justified by the fact that these societal issues are reflected at the firm level. In our view, the incorporation of societal considerations into corporate governance is part of a broader revision of shareholder primacy.

As we discuss in our [ESG Primer](#)¹, over the last few years, there has been an important change in zeitgeist in the corporate world. In discourses, the shareholder value theory is increasingly giving way to talk about stakeholder value. While not explicit, this change has been significant in developed economies, taking the form of debates, reports, and regulatory changes redefining the Corporate Purpose:

- The Business Roundtable—a group of CEOs of large US firms—adopted a statement moving away from shareholder primacy and redefining the Purpose of a Corporation to promote ‘An Economy That Serves All Americans.’
- The World Economic Forum released a new Davos Manifesto, which states that “The purpose of a company is to engage all its stakeholders in shared and sustained value creation. In creating such value, a company serves not only its shareholders, but all its stakeholders – employees, customers, suppliers, local communities and society at large.”

Many are questioning the effective changes that will be brought by this conceptual shift. But one of the most notable “short-term” impacts is likely to be regulatory changes implemented at the European level. In fact, beyond the taxonomy for sustainable economic activities, or the eco-label for financial products based on it, one of the action points of the EU action plan on sustainable finance has been action 10: Fostering sustainable corporate governance and attenuating short-termism in capital markets.

Concretely, the question of the split of value creation between stakeholders is an increasing focus for regulators, consumers, investors and corporates. As such, the value creation split and its evolution between customers, management, employees, suppliers, lenders as well as governments will undoubtedly occupy a greater importance in a world where companies are increasingly

¹ [What happened to ESG?](#). J. Hecker and H. Dubourg, 6 Mar 2020

asked to justify their societal contribution and to have a purpose beyond profit maximization.

In our view, the holistic assessment of the value creation split between stakeholders is a necessary step towards the quantification of the corporate impact and its contribution to the Sustainable Development Goals.

Social implications

Short term: A CSR responsibility to contribute to a global challenge

As for any economic crisis, we expect COVID-19 to have a disproportionate impact on certain segments of the population, worsening inequalities that have already been highlighted as one of the most pressing economic challenges of the 21st century. So what does this mean for companies? There is obviously a need for short-term financial management to ensure business continuity, and public support will be needed to account for short-term revenue losses. However, we believe there is also a corporate responsibility to contribute to this global challenge by supporting customers, employees and supply-chains.

Customers: Business continuity, support and a shift to digital

The most important responsibility of businesses towards customers is to ensure business continuity and customer support during the crisis. While the global health impact of the GCC is not to be underestimated, the largest economic impact will arguably come from the widespread containment measures adopted in most countries, which are directly affecting consumer spending.

Beyond business continuity and adapting to changing demand, we believe specific customer support should be highlighted during this crisis. Numerous voluntary measures have already been announced across sectors.

Poste Italiane stated that it would pay pensions in advance to pensioners who retire in April. Banks across Europe have been offering moratoriums on mortgage payments. **L'Oréal** announced that small businesses such as hair salons and perfume stores will have their payments frozen until business resumes. Utilities **Endesa**, **Iberdrola** and **Naturgy** will allow clients to temporarily lower the maximum load contracted, which will allow for a reduction in fixed payments in monthly bills, and are offering clients facing distress financing at zero cost of the payment of bills in periods between 6 and 12 months.

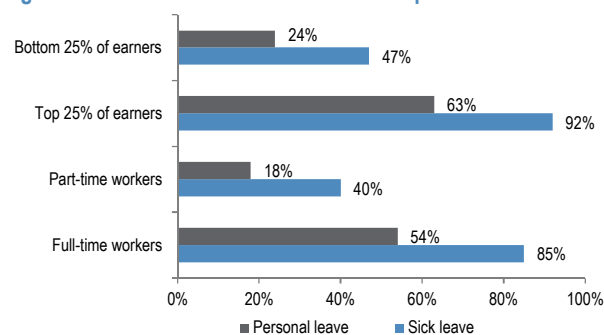
Employees: A greater focus on benefits and remote working

Human capital was the single most addressed ESG topic mentioned by investors in our survey. There is a strong consensus among investors that companies that have better social dialogue and more-engaged employees will more easily navigate through difficult times and will also be in a better position to take advantage of the post-crisis rebound and the associated opportunities.

A health crisis could be disproportionately financially material in geographies where many companies self-insure for medical claims made by employees and healthcare costs are a significant operating cost. Benefits, such as paid time off, also play a role to encourage sick employees to stay home.

In the US, only 40% of part-time workers have access to paid sick leave, and the lack of such benefits is disproportionately affecting poor and part-time workers. That being said, the CARES Act includes emergency social support—including direct payments to Americans and a large expansion of unemployment insurance. A structural increase of social security nets in some countries could be a long-term consequence of short-term decisions designed to tackle the health crisis.

Figure 1: Percent of workers with access to paid leave benefits



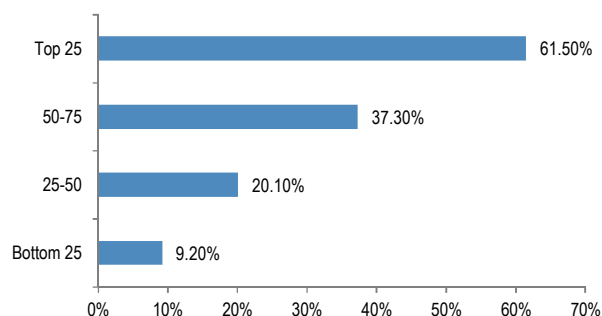
Source: US Bureau of Labor Statistics, J.P. Morgan

The massive and sudden shift to remote working (WFH) is the other key impact of the crisis, and WFH appeared as the third most mentioned ESG topic in our survey. The health crisis is proving that entire industries can keep functioning with a significant share of employees working away from corporate offices. In our view, the development of remote working was mostly constrained by the lack of an adequate corporate IT infrastructure and a managerial culture of presenteeism. As the GCC has forced companies to address both limiting factors, the change is likely to endure. A generalization of remote

working could also decrease commuting, office space, and indirectly, the cost of real-estate in metropolises as workers can live and work elsewhere.

Yet this evolution also requires the implementation of corporate policies and management practices to account for the impacts of telework. A 2017 joint report by the ILO and Eurofound highlighted that the positive effects of remote working usually include a shortening of commuting time, greater working time autonomy, better overall work-life balance, and higher productivity. At the same time, disadvantages include its tendency to lengthen working hours, to blur work and personal life, and to result in work intensification, which can lead to high levels of stress with negative consequences for workers' health and well-being. Finally, remote working is biased in terms of geographies, roles, sectors and income. Regarding these different elements, the development of remote working should be monitored and accompanied by dedicated corporate and public policies.

Figure 2: WFH disproportionately benefits high income workers
Percentage of US workers who can work from home by income quartile



Source: US Bureau of Labor Statistics, J.P. Morgan

Supply chain: A test for just-in-time global integration and towards more transparency

By the sudden and important disruption it represents for companies, the GCC has highlighted the potential weaknesses of globalized supply-chains, but also the outsized importance of a few key manufacturing hubs. Supply chain was the fourth most mentioned ESG topic in our investor survey. Investors are expecting a greater focus on supply-chain resilience for companies, as well as a trend of relocalization of these supply chains.

For obvious reasons, the issue is directly impacting manufacturing sectors, but it also has implications for the whole economy because of the sectors' interdependence. While just-in-time manufacturing has revolutionized business operational efficiency, by favoring small inventories and low defect rates, it has also created

vulnerabilities. Low inventories and high turnover make producers reliant on inputs arriving swiftly from suppliers. Combined with the complexity created by the global footprint of large firms, the modern economy has significantly increased the need for transparency and assessment of supply chains. The difficulty increases significantly regarding tier-two suppliers and beyond, with the network of subcontractors. The figures are highly differentiated by industry and according to the position in the value chain. For example, **Sanofi** has 86,000 suppliers in 157 countries, while **Intel** has 11,000 suppliers in 90 countries.

Some geographies have a disproportionate importance in global supply chains and the relative importance of specific manufacturing hubs differs vastly by sector. For example, the relative importance of Italy in the textile industry combined with its exposure to the GCC is likely to be reflected in disruptions for the sector. On the other hand, a negative evolution of the GCC in the US could have large impacts for information and communication technology (ICT) goods. The differentiated reality of the globalization of supply chains creates the need for specific corporate mapping of risk exposure by geographies.

In this context, the assessment, classification and transparency relating to the supply chain appear crucial. **Nestlé** has disclosed since 2019 the list of suppliers of its priority commodities, which account for 95% of the company's annual sourcing of raw materials. The company now provides this information for palm oil, pulp and paper, soya, meat (beef, pork, veal, lamb/mutton), hazelnuts, vanilla, seafood, coconut, vegetables, spices, coffee, cocoa, dairy, poultry, eggs, cereals and sugar. We believe sustainable supply-chain management, by increasing trust, knowledge and transparency, represents a clear advantage in case of disruption.

External certifications and guidance (ISO28000, 20400) and industry-specific initiatives (Global Enabling Sustainability Initiative) or raw-material specific initiatives (Responsible Cobalt Initiative) are also a proxy for adequate management of the supply chain, even if the level of stringency of such initiatives may vary. Over the longer run, it is likely that the GCC will increase transparency about supply chain management, as well as push companies to diversify their suppliers. Regarding potential relocalization efforts, they will, in our view, be mostly politically driven. We note that such a change would, in some cases, go against business objectives for which geographical diversification is a risk-management approach. For example, **Airbus**

identified global sourcing as one of its long-term objectives and aims to source 40% outside Western Europe and the US by 2020.

Beyond supply-chain policies and management, we believe this time of crisis will test the strength of the relationships between companies and their supply chains. Among the announcements so far, **Unilever** announced €500 million of cash flow relief (7.8% of 2019 Free Cash Flow) across its extended value chain, with a significant part dedicated to the supply chain:

- Early payment for the most vulnerable small- and medium-sized suppliers, to help with financial liquidity.
- Extending credit to selected small-scale retail customers whose business relies on Unilever.

Medium term: Social risks could exceed the GFC

As discussed above, firms have a responsibility towards their stakeholders and can contribute to limiting the overall societal impact of the GCC. In the short term, millions of jobs are threatened by the health crisis. For comparison, the GFC increased global unemployment by 22 million.

These are preliminary estimates, which will evolve depending on fiscal and monetary responses around the world. Importantly, the previous numbers do not account for the quality of work, underemployment and working poverty, with each of these elements being expected to deteriorate. Finally, as for any economic crisis, COVID-19 will have a disproportionate impact on certain segments of the population, worsening inequalities that have already been highlighted as one of the most pressing economic challenges of the 21st century. Among the most vulnerable, the ILO highlights:

- **Individuals with underlying health conditions and older people** are most at risk of developing serious health issues.
- **Young persons**, already facing higher rates of unemployment and underemployment, are more vulnerable to falling labor demand, as witnessed during the GFC. **Older workers** can also suffer from economic vulnerabilities.
- **Women** are over-represented in more affected sectors (such as services) or in occupations that are at the front line of dealing with the pandemic (e.g., nurses). The ILO estimates that 58.6% of employed women work in the services sector around the world, compared to 45.4% of men. Women also have less

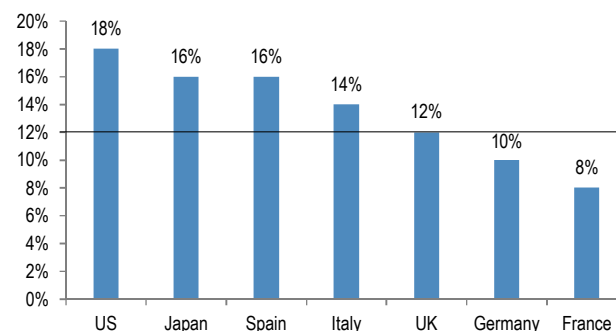
access to social protection and will bear a disproportionate burden in the care economy, in the case of closure of schools or care systems.

- **Unprotected workers**, including the **self-employed, casual and gig workers**, are likely to be disproportionately hit by the crisis as they do not have access to paid or sick leave mechanisms, and are less protected by conventional social protection mechanisms and other forms of income smoothing.
- **Migrant workers** are particularly vulnerable to the impact of the COVID-19 crisis, which will constrain both their ability to access their places of work in destination countries and return to their families.

Because of the disproportionate negative social impacts on already underprivileged parts of the global population, we believe that large political and social tensions could increase in a world that, more than 10 years after the GFC, has done little to address these issues.

The OECD estimates that 36% of the OECD population would be at risk of falling into poverty if they had to forgo three months of their income. With 12% of the OECD population already living in relative income poverty, and despite significant fiscal and monetary support, the GCC could create a level of social distress not seen in developed economies in decades.

Figure 3: 12% of the OECD population lives in relative poverty
% of the population living in relative income poverty (using the OECD definition)

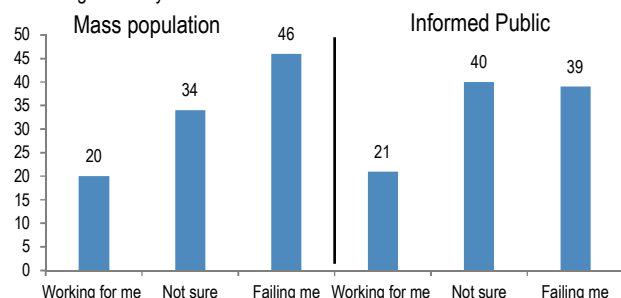


Source: OECD "How's Life?" Database, J.P. Morgan

The combination of a challenging economic situation and social distress with high levels of public defiance could result in political instability. The [2019 Edelman Trust Barometer Global Report](#), an online survey conducted in 27 developed and emerging economies, highlights that less than one out of two people trust government. Even more profound than mistrust in government, 46% of the population believe that the system is "failing them." More than two thirds respectively feel "a sense of

injustice” and a “desire for change.” We believe that this explosive mix justifies unprecedented political action in the short term, illustrated by direct cash payments in the US, but will also foster deeper changes. Aggressive expansion of unemployment benefits is unlikely to revert to pre-crisis levels.

Figure 4: Only 1 out of 5 believe the system is working for them
% who agree the system is...



Source: 2019 Edelman Trust Barometer Global Report, J.P. Morgan

Long-term implications: the GCC as a catalyst for the shift from Social to Societal

We believe the GCC will foster a focus on societal issues for corporations. In fact, even when the direct health and human impacts are overcome, the wide gap between the state of our world and the ideal of the United Nations Sustainable Development Goals will likely remain. As reaching those goals is highly dependent on economic growth, we may be further off course. According to the United Nations Environment Programme Finance Initiative, an estimated \$5-7trn a year until 2030 is needed to reach the SDGs worldwide, including investments in infrastructure, clean energy, water and sanitation, and agriculture. In consequence, a global recession would make the daunting task of reaching the SDGs by the end of the decade even more challenging.

Yet this unprecedented crisis could act as a catalyst for change. To tackle what Angel Gurría, Secretary-General of the OECD, described as the “third and most serious economic, financial and social crisis of the 21st century,” calls for a level of ambition corresponding to the Marshall Plan on a global scale.

In particular, we expect corporates to rise to the challenge, guided by regulation, incentivized by consumer preferences and pushed by investor engagement.

We believe that corporations are well-positioned to thrive in this new environment. The 2019 Edelman Trust Barometer Global Report underlines that although less than

half of respondents trust government (48%) and the media (47%), three out of four workers trust their employers. 76% of respondents believe CEOs should take the lead on change rather than waiting for government to impose it. This profound change from a culture of compliance to a culture of leadership should create positive momentum in the private sector. Numerous studies highlight the specific benefits of engaged employees, trusted suppliers, or reduced carbon emissions. In our view, the next step will see a growing incorporation of stakeholders’ views and a focus on contributing to the SDGs.

Multiple companies have announced strong commitments towards their stakeholders, communities, and society as a whole. Private initiatives, such as the WEF COVID Action Platform, are proof that companies can contribute to societal goals. While, as for the SDGs, some sectors have a more direct contribution to fight the GCC, every firm can have a positive societal contribution. Among the numerous initiatives, we have noted:

- **LVMH** and **L’Oréal** have used their factories to produce hydro-alcoholic gel.
- **Unilever** announced €500mn of cash flow relief (7.8% of 2019 Free Cash Flow) across its extended value chain, €100mn of soap donation, early payment for most vulnerable small- and medium-sized suppliers, and credit to selected small-scale retail customers whose business relies on Unilever.
- **Accor** has offered between 1,000 and 2,000 hotel rooms to health workers, and **Airbnb** has created a platform to allow homeowners to do so.
- **Vodafone** is giving unlimited mobile data to 500k customers on its Pay Monthly plans; customers flagged as “vulnerable” in its systems will get 30 days of unlimited 4G data on their smartphone automatically.
- **Microsoft** created a COVID-19 assessment bot for the US Centers for Disease Control and Prevention. The bot can assess the symptoms and risk factors for people worried about infection.
- **Enel** has drawn up an insurance policy to cover the group’s global workforce of 68,000 employees in the event of hospitalization with the COVID-19 virus.

Will stakeholder capitalism become the new normal?

- **The COVID-19 crisis is accelerating the trend of stakeholder capitalism and challenging shareholder primacy.**
- **The Social and Governance pillars will gain greater prominence in ESG methodology post-pandemic.**
- **Further regulatory changes establishing more rigorous corporate governance requirements will likely be adopted in Europe...**
- **...while the COVID-19 crisis could accelerate the shift towards ESG reporting and disclosure requirements that focus on longer-term stakeholder value in the US but fall short of imposing regulatory standards.**
- **Rating agencies will also place greater emphasis on stakeholder management.**

What's at stake?

The economic toll from the COVID-19 crisis is catalyzing changes in corporate behavior, accelerating the transition from the old paradigm of shareholder primacy—that corporations exist principally to serve shareholders—to a new and evolving form of stakeholder capitalism. The seeds for this transformation were in motion well before the COVID-19 pandemic, as the rise in populist forces and the focus on income inequality were already shifting the social contract between businesses, policymakers, and the public. The COVID-19 crisis illustrates the limitations of government decrees and market incentives, as the behavior of the community will dictate the future path of the crisis. In this chapter, we review the degree to which COVID-19 has accelerated the trend toward stakeholder approaches to investment over shareholder primacy. This trend began with the Business Roundtable's release of a new Statement on the Purpose of a Corporation on August 19, 2019, which was signed

by 181 CEOs who represent \$5trn in annual revenue and nearly one-third of the total value of the US stock markets and account for more than 40% of all corporate income taxes paid to the federal government.¹ The new statement of corporate purpose focuses on the need to lead their companies for the benefit of all stakeholders, encompassing customers, employees, suppliers, communities and shareholders.²

After the Business Roundtable announcement, JUST Capital released its “Roadmap for Stakeholder Capitalism,” which assigns a lower weighting for shareholders than for workers and customers. JUST Capital assigns stakeholders the following weights in its ranking system: investment in workers (35%), treatment of customers (24%), support for communities (18%), impact on environment (11%) and serving shareholders through good governance (11%).³ The World Economic Forum's Davos Manifesto 2020 endorsed the same principles and redefined the universal purpose of a corporation in the Fourth Industrial Revolution as having an obligation to “engage all its stakeholders in shared and sustained value creation. In creating such value, a company serves not only its shareholders, but all its stakeholders – employees, customers, suppliers, local communities and society at large.”⁴

The investor community outlined similar views in many of their 2019 and 2020 annual shareholder letters, with BlackRock, Vanguard and State Street—the “Big Three”—which hold around 25% of voting power across the S&P 500, committing to incorporate sustainability considerations into their investment framework and products. BlackRock has placed sustainability at the center of its investment approach and sees an inflection point for the adoption of global sustainable ETFs and index funds, projecting that many investors will rotate out of traditional funds and into sustainable ones, with \$1trn of new assets poised to invest in sustainable ETFs and index funds by the end of this decade.⁵

¹ [Effective Leadership on the World Stage: CEO Memos to Congress](#), Business Roundtable

² [Business Roundtable Redefines the Purpose of a Corporation to Promote 'An Economy That Serves All Americans'](#), Business Roundtable, 19 August 2019

³ [A Roadmap for Stakeholder Capitalism: 2019 Survey Results](#), JUST Capital

⁴ [Davos Manifesto 2020: The Universal Purpose of a Company in the Fourth Industrial Revolution](#), Klaus Schwab, World Economic Forum, 2 December 2019

⁵ [Reshaping Sustainable Investing](#), Philipp Hildebrand et al., iShares, BlackRock

Companies prioritizing stakeholders over shareholders during COVID-19

As Jan Loeys argues in [The Long-term Strategist: Some Longer-term Consequences of Covid-19 Crisis](#) (April 9, 2020), “resilience” has become the new buzzword for companies, i.e., making sure that businesses are strong enough to absorb the next big shock. This sentiment has been voiced in J.P. Morgan’s recent ESG client survey, with resilience identified as the second most mentioned ESG consideration after human capital in gauging the ability of a company to manage a crisis (see [Stay safe and think long term: DATA-Driven: COVID-19 likely to be a long-term catalyst for more balanced ESG investing](#), Hecker et al., March 30, 2020). Loeys argues that this can include a range of measures, including better-equipped back-up offices, technology to allow people to work remotely, flexible working arrangements, more diversified supply chains, greater liquidity, more credit lines, longer-term funding, and reduced leverage.

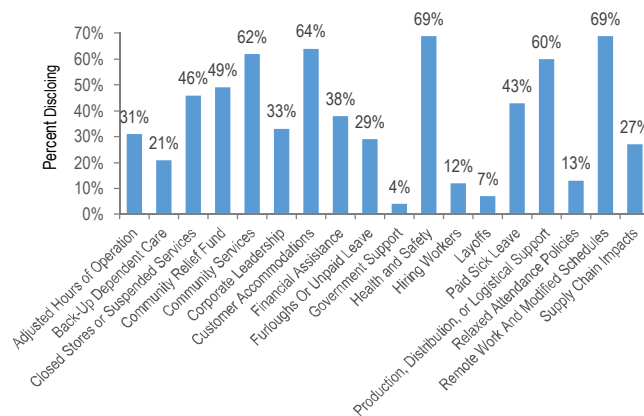
JUST Capital’s COVID-19 Corporate Response Tracker for the 100 largest public employers in the US highlights the degree to which corporates have adopted policies that prioritize human capital issues related to workers, customers and communities in response to the pandemic. Of the 100 largest public employers in the US, 69% have implemented remote work and modified schedules and enhanced health and safety measures, 64% have provided customer accommodations, and 62% have expanded community services (Figure 1). Nearly 40% are providing their workers with some type of financial assistance, and only 4% are receiving government support. These measures far outstrip actions such as furloughs or unpaid leave (29%), and businesses have emphasized strengthening employee and community engagement.⁶

Along these lines, on April 14, 2020, the Business Roundtable released essential guidelines to restart the economy that focus first on protecting workers, customers and communities, reinforcing the shift to stakeholder capitalism.⁷

⁶ [The COVID-19 Corporate Response Tracker: How America’s Largest Employers Are Treating Stakeholders Amid the Coronavirus Crisis](#), JUST Report, JUST Capital

⁷ [Business Roundtable CEOs Created Guidelines for Reopening the Economy – We’ll be Tracking Which](#)

Figure 1: JUST Capital’s COVID-19 Corporate Response Tracker highlights the degree to which corporates have adopted policies that prioritize human capital issues



Source: [JUST Capital](#)

While nearly all the rating actions taken during this time have been driven by the impact of the lockdown on revenue and cash flow, Standard & Poor’s highlights that this could evolve, with differences in stakeholder management ultimately playing into future rating actions, especially where companies differentiate themselves materially from their industry peers. J.P. Morgan’s US High Grade Credit Research and Strategy team highlights that YTD, 9% of Non-Financial HG bonds were downgraded, representing the fastest pace of downgrades since at least 2007, and that it is only through April (see [No pause from the rating agencies across HG credit: A review of the aggressive rating actions taken YTD](#), E. Beinstein et al., 1 May 2020). S&P Global Ratings’ public Environmental, Social, and Governance (ESG) evaluations could be revised based on revealed strengths or deficiencies in the management of social factors relative to an entity’s global peers including: 1) workforce, especially in case of layoffs or reduced productivity; 2) the health and safety of its workforce, suppliers, contractors, and other key stakeholders; 3) changing consumer behaviors and preferences; 4) activities that support communities or diminish the company’s social license to operate.⁸ Within the ESG pillars, S&P considers social risks as the most acute factors right now, particularly health, safety, and workforce dynamics, both for direct financial

[Companies Prioritize a Stakeholder Approach to the Recovery](#), Amanda Keating, JUST Capital, 15 April 2020

⁸ [ESG Evaluations Remain Unchanged For Now In Light Of COVID-19](#), Noemie De La Gorce, Beth Burks, Thomas Englerth, S&P Global, 7 April 2020

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consequences as well as less tangible indirect reputational risks.⁹ S&P argues that effective stakeholder management will become increasingly important for companies to successfully operate in a world of weakened public finances, social scars, and environmental degradation.¹⁰

Regulatory shift to supporting the stakeholder

The COVID-19 crisis is accelerating the shift towards longer-term, stakeholder value reporting requirements as national governments become not only the lenders of last resort but also the issuers and providers of last resort. Large listed corporations, willingly or reluctantly, will likely be compelled to reduce buybacks, cut dividends, and reduce the compensation of top executives. Our European ESG team highlights that the COVID-19 crisis has increased scrutiny around the sustainability and equity of corporate distribution policies, with greater focus on dividend payments, stock buybacks and executive remuneration over shareholder primacy ([Hecker and Dubourg](#)). In the 10-point EU action plan on sustainable finance, one of the key objectives is to foster sustainable corporate governance and attenuate short-termism in capital markets. European governments, including France and Germany, stated that no dividend should be paid by companies benefiting from public support. In the US, the American CARES Act sets a two-year total compensation cap for executives and employees of firms entering into a loan or loan agreement with the US Treasury.

However, in recent weeks the Trump administration has also moved to roll back environmental protection standards, notably the Corporate Average Fuel Economy (CAFE) standards that were introduced under President Obama, which have been opposed by the auto industry.¹¹ Even in Europe, the prioritization of pandemic measures may delay climate policies. Poland and Czech Republic, the worst performers in the EU in terms of GDP per unit of CO₂, have pushed for a delay to the EU's commitment to achieving carbon neutrality by 2050.¹²

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⁹ [The ESG Lens On COVID-19, Part 1](#), Corinne B Bendersky et al., S&P Global, 20 April 2020

¹⁰ [COVID-19: A Test Of The Stakeholder Approach](#), Bernard De Longevialle et al., S&P Global, 21 April 2020

¹¹ [Trump administration rolls back Obama-era fuel efficiency standards](#), Rebecca Beitsch, The Hill, 31 March 2020

¹² [The EU's Drive For Carbon Neutrality By 2050 Is Undeterred By COVID-19](#), Marion Amiot et al., S&P Global, 29 April 2020

How will COVID-19 change ESG reporting requirements for companies?

- **We expect the COVID-19 crisis to accelerate the shift of reporting requirements towards long-term, stakeholder principles, fostering a more balanced and holistic ESG approach.**
- **Corporates have the opportunity to leverage the complementarities between existing ESG reporting frameworks to produce differentiated ESG narratives that fit their purposes and business strategies.**
- **In the long term, this could strengthen “integrated reporting” and sustainable accounting frameworks.**
- **In the medium term, the focus will remain on capital allocation, executive compensation, employee support, value chain support, societal contribution and long-term environmental strategies. Over time, there could be requirements for improved ESG reporting on supply chains.**

When integrating ESG in their investment strategies, investors will incorporate two types of ESG data: primary data (e.g., reported by companies) or secondary (e.g., ESG ratings or derived from primary data). We take a look at how reported data have evolved over time and what the implications of the COVID-19 crisis could mean for the production of primary ESG data.

Investors are not the sole audience of companies’ ESG reporting

For a company, the reporting of non-financial data may serve different purposes and different stakeholders. For example, it can be used internally, either to manage specific projects, and/or to produce reports to higher levels of management within the companies. It can also be used externally, either specifically targeting shareholders, or broader stakeholders, like consumers, regulators, or specialized third parties (e.g., extra-financial ratings agencies or providers of well-known ESG indices).

Depending on the targeted use and audience, the resources that a company allocates to the production of ESG data may differ. More importantly, this basic

question may influence the choices made by companies when defining the boundaries and the assumptions used to produce the data.

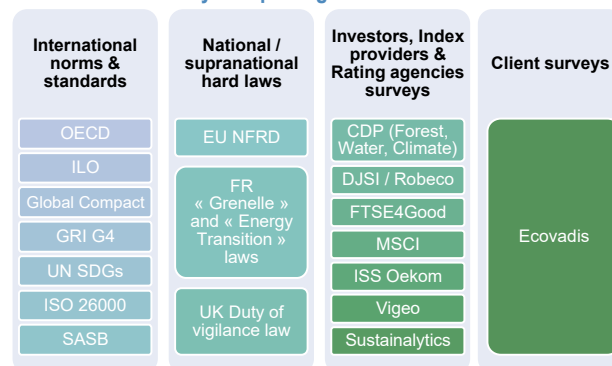
Corporates tend to go through materiality assessments to determine which data to report. This type of work typically involves different types of sources—industry research, benchmarking with peers, mapping sustainability impacts across the value chain, conducting phone interviews with internal and external stakeholders, as well as conducting surveys.

The results typically take the form of a matrix, using charts that integrate two axes: one is the “importance to stakeholders” and the second is the “importance to the company.” Such matrices can be useful to establish a company-specific ESG framework of analysis, but the “importance to the company” is not necessarily driven solely by financial materiality.

Frameworks of reporting are diverse, but complementarities exist

Irrespective of the end-use and the audience targeted, there is no single standard to choose and calculate / produce the relevant data. On the contrary, the “world” of extra-financial reporting framework is extremely (and increasingly) diverse, as shown below.

Figure 1: Companies may choose or have to report according to an immense diversity of reporting frameworks



Source: J.P. Morgan

The targeted audience may also influence the type of standards / framework that companies will use to produce ESG data, as some frameworks may be multi-stakeholders (e.g., Global Reporting Initiative or “GRI”) or mostly oriented towards investors (e.g., Sustainability Accounting Standards Board or “SASB”). However, complementarities often exist among frameworks, and companies should strive to leverage them to develop an ESG reporting that best fits their purposes.

Frameworks may also be more or less prescriptive. For example, GRI leaves the identification of “material” ESG issues to the appreciation of the company (making it a completely bottom-up process such as the one described above for materiality matrices). The standards adopt a modular approach, and define methods and indicators to report based on specific sustainability themes (environment, social, economic). SASB, on the other hand, identifies ESG issues that are deemed financially material and specific to activities. This is a much more “prescriptive” approach as it identifies specific criteria that the company may choose to report. However, both standards remain voluntary.

In other cases, reporting according to specific frameworks may be mandatory, in which case there is less flexibility. For example, the upcoming EU taxonomy tends to be similar to SASB since it is activity-based and prescriptive in Key Performance Indicators (KPIs). However, it is focused on “sustainable materiality,” rather than on financial materiality of ESG factors.

Reporting approaches have evolved over time

Reporting practices are not set in stone and have been constantly evolving over time. In our view, the multiplication of reporting frameworks has followed three trends:

Transparency: Originally, the first reporting frameworks have focused on creating the conditions for the market to produce enough data to allow for the accounting of environmental and social impacts of companies. This is what drove the creation of the “Global Reporting Initiative” (GRI). For some indicators, this has required a significant effort in methodology design. A good example of this is the “GHG (greenhouse gas) protocols” that set principles and standards to help organizations calculate their GHG emissions on different scopes in a comparable and reliable manner.

Materiality: The efforts to create a comprehensive accounting of the environmental and social impacts of organizations were sometimes criticized for being too separated from the companies’ “core businesses.” Hence, the much-debated concept of materiality pushed the development of more targeted reporting frameworks, based on either specific sectors or topics (e.g., GRI sector guidance, CDP questionnaires, TCFD recommendations).

Forward-looking and scenario-based: The most recent trend is to push companies to report forward-looking information on their sustainability strategies. As an increased number of stakeholders, including investors, agree that the materiality of E, S and G factors should be considered on a time horizon consistent with sustainability challenges, companies are increasingly asked to publish “forward looking sustainability strategies,” such as resiliency plans under a 2°C warming scenario for Oil and Gas companies.

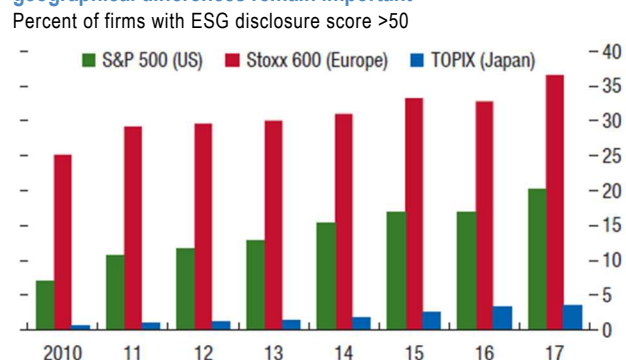
Data availability is improving, but assurance remains an issue

In practice, the production of data and its quality vary greatly from one organization to another.

Some companies have extensive teams and dedicated IT systems, whereas less mature companies may be struggling, with little dedicated expertise and a lot of manual processing of data.

ESG reporting is improving over time, albeit companies with smaller capitalization tend to report less (both quantitatively and qualitatively). Moreover, differences in local regulations may also introduce specific country /region requirements. For example, while disclosure has improved globally, it remains much higher in Europe than in other geographies. Moreover, there remains significant room for improvement with regard to data quality, relevance, and comparability.

Figure 2: ESG disclosure has increased over time but geographical differences remain important



Source: IMF

In many cases, data assurance remains an issue.

First, audited data is limited. According to Si2’s “[State of Integrated & Sustainability Reporting 2018](#)” findings, of the 395 (78%) S&P 500 companies that issued sustainability reports, only 36% included some form of

external assurance. In 90% of the cases, this external assurance pertained only to some data (mostly GHG emissions), with only 3% of reporters stating that their ESG reports were externally verified.

Second, the audit processes do not check all data, but aim to provide an independent verifiers' report on compliance and sincerity of the information published. In other words, an audit reinforces the credibility of the reported data, but cannot guarantee its accuracy.

Lastly, most of the users of ESG data do not base their use of the data on whether the data have been audited externally. Indeed, in many instances, only the fact that the data have been produced represents a differentiator versus peers.

Issuers tend to feel insufficiently rewarded for their sustainability efforts

Corporates often report that their efforts in ESG reporting and performance management fail to be considered by stakeholders, especially when these stakeholders follow a "box-ticking" type of approach, which fails to understand the specificities of companies' efforts. We expect these cost/benefit equations to become clearer, as shareholders will increasingly price in negative and positive sustainability impacts.

Moreover, the current work done at the EU level to determine whether ESG research providers should be subject to more regulations, combined with tools like the EU taxonomy and the upcoming revision of the non-financial reporting directive (NFRD) are likely to deliver improvement on this issue, at least at the EU level. From a non-EU perspective, companies following the EU principles of sustainability reporting are likely to attract EU investors more easily.

Will the stakeholder revolution drive a shift in company reporting?

In August 2019, the US Business Roundtable issued a new Statement on the Purpose of a Corporation, which was signed by 181 CEOs, who committed to lead their companies for the benefit of all stakeholders: customers, employees, suppliers, communities and shareholders. We expect this announcement, which is largely echoed in Europe by the Action Plan for Financing Sustainable Growth, to support the development of impact-driven reporting principles, targeting multi-stakeholders.

Ultimately, we believe that investors will develop models that incorporate negative and positive externalities in financial valuation, and that this trend will be supported and required by regulators.

How is COVID-19 likely to impact corporates' ESG Reporting?

The COVID-19 crisis is likely to increase the shift towards sustainability reporting, as a pandemic outbreak highlights the need to strengthen the sustainability and resilience of our societies and economies.

Moreover, we expect the COVID-19 crisis to rebalance investors' ESG approaches towards more "S" and "G". This will result into more holistic and balanced ESG approaches; since 2015, the focus on the "E" (and more specifically climate change) had outweighed other long-term sustainability challenges and systemic risks.

This shift in focus from investors is likely to influence future corporate reporting, and in the medium to long term, may strengthen "integrated reporting" types of approaches, or even "sustainability accounting" types of frameworks, where the social and environmental positive and negative impacts of an economic activity are put in comparable terms.

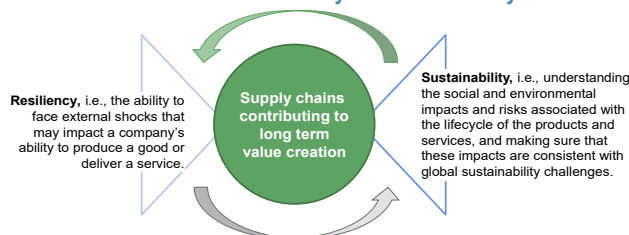
In the short term, we believe that a holistic corporate ESG answer to the GCC would be based on six sub-pillars:

- **Governance:** 1) Capital Allocation and 2) Executive Remuneration;
- **Social:** 3) Employee Support, 4) Value Chain Support and 5) Societal Contribution;
- **Environmental:** 6) Environmental Commitments.

Resilience of supply chains is likely to be a focus for both mainstream and ESG investors post COVID-19

We expect corporates to also increase the quality and granularity of ESG-related reporting on supply chains. Indeed, the COVID-19 crisis has put supply chains' resiliency (i.e., the ability to face external shocks that may impact a company's ability to produce a good or deliver a service) under the spotlight. In our view, this aspect cannot be separated from supply-chain sustainability, as the combination of both are conditions to deliver long-term and sustainable value creation.

Figure 3: Supply-chain management consistent with long-term value creation focuses on resiliency and sustainability



Source: J.P. Morgan

From a sustainability perspective, the wider “societal impact” that companies have by building long-term and qualitative relationships with suppliers is going to be a point of attention for shareholders, as companies have the ability to demonstrate their commitments to “corporate purpose” by actively supporting suppliers and sub-contractors.

From a broader perspective, this crisis questions the “just in time” approaches, implying low inventories and high turnover, on which modern supply chains have been designed. We think that this will lead to the comeback of “just in case” approaches, and a partial relocalization of production of specific goods.

Towards strategic relocalizations of supply chains

However, we would be very cautious on announcing that this will drive a significant relocalization of production facilities. In our view, the scope of the vast majority of external shocks that can threaten supply chains (e.g., extreme weather events, social unrest, geopolitical conflicts) are limited in time and space. As such, the geographical diversification of suppliers remains a factor of resiliency, and therefore a competitive advantage.

It is more likely that the COVID-19 crisis will drive a partial “relocalization” for the value chains of goods that are considered “strategic” or “valuable” from a social utility perspective and/or by political will. This will likely impact some parts of Healthcare and Pharmaceuticals supply chains, as well as Consumer Staples.

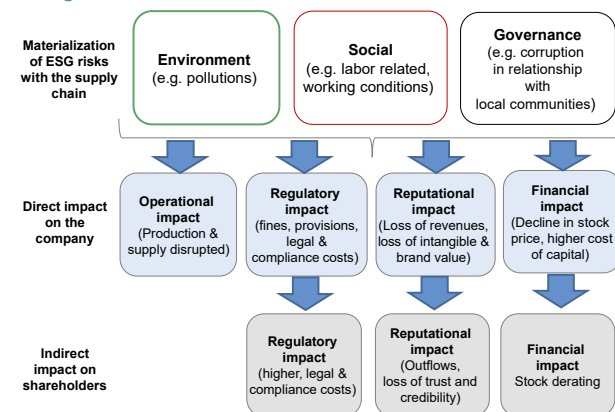
“Usual” ESG risks of supply chains are likely to be under the spotlight

Beyond the resiliency and relocalization aspects, we believe that COVID-19 will put the “usual” ESG risks of supply chains in the spotlight, highlighting the risks

related to quality—which are a traditional focus of procurement as low quality products can represent safety issues, both in the operational and downstream scopes—as well as focusing on the risks related to sustainability, from a social, environmental and governance perspective. We summarize these risks under four main categories:

- 1) **Quality:** Low quality of raw materials and low quality of manufacturing processes.
- 2) **Social:** Labor-related risks (forced labor / modern slavery, child labor, poor working conditions), occupational and community health and safety, stakeholders’ relations (indigenous people rights, conflict zones).
- 3) **Environmental:** Negative impacts on natural capital (GHG and climate change, pollution of soils, air and water, impacts on ecosystems and biodiversity, unsustainable use of abiotic resources).
- 4) **Governance:** Risks related to business ethics and to corruption.

Figure 4: ESG risks in supply chains can be financially material through different channels



Source: J.P. Morgan, based on French SIF

More than ever, these risks will need to be considered material by investors, and the channels of transmissions will face increased scrutiny.

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Sustainable Finance to play a key role in the EU recovery

- **Regulations are crucial catalysts for determining the financial materiality of ESG factors and will play an important role in the future development of the ESG market.**
- **However, the main catalyst for the mainstreaming of ESG globally will come from consumers who are increasingly focused on sustainability risks and challenges.**
- **We believe that the EU regulatory framework on sustainable finance will play a key role in Europe's recovery with international implications, particularly for Asia.**

Regulations are among the most important catalysts for determining the financial materiality of ESG factors

The European Union's Green Deal envisions a recovery that will build the bridge between fighting COVID-19, biodiversity loss, and climate change. The Green Deal outlines a new growth strategy for the EU that delivers on the twin benefits of stimulating economies and creating jobs while accelerating the green transition in a cost-efficient way. This suggests that regulations will be among the most important catalysts for determining the financial materiality of ESG factors. The systemic risks posed by sustainability-related challenges like climate change, biodiversity losses, and inequalities all have profound environmental, social and governance implications. On the other side, there are stakeholders positioning themselves towards these issues, based on how they expect others to position.

We consider four agents in a materiality analysis: corporates, investors, regulators, and consumers. For example, for a corporate, an E, S, or G issue such as a human rights violation controversy is likely to be financially material if:

- Regulators have put in place legislation that can result in a fine and / or increase compliance costs (e.g., the UK Modern Slavery Act, the US Conflict Minerals rule, or the French "Duty of care" law);

- Consumers are making decisions based on their perception of this issue (e.g., boycotting products related to this controversy);
- Investors adjust their valuation models based on this controversy (e.g., reducing their cash-flows forecasts for a company experiencing a human rights violations type of controversy);
- Business partners decide to stop relationships following this controversy, and / or the corporate itself decides to spend money on processes to mitigate such risk.

Regulations often remain the only efficient manner to foster economic changes in manufacturing and consumption patterns. On June 2015, Oil CEOs (BP, Eni, RDS, Equinor and Total) published a joint statement calling for the UNFCCC to implement an international carbon price to bring about change in a united approach. Moreover, regulations can also be an accelerator of technological developments, such as the catalytic converter, which was a response to the adoption of emissions standards by the EPA, following the US Clean Air Act in 1970.

Regulations can play the same role in development of the ESG market worldwide, which is based on iterative interactions between corporates, consumers, regulators and investors.

Consumers are looking for financial and sustainability returns on investments

Globally, we think that consumers are, and will remain, the driving force behind the development of the ESG market. Indeed, while Sustainable Finance was originally targeting a niche market, products and strategies expanded in scope as retail investors were increasingly interested in combining sustainability performance with their investments. We see this as a response to the increased awareness that climate change and biodiversity losses pose major risks to well-being as scientific evidence points to the risks of highly disruptive sustainability crises in the future.

In its Global Investor Study, covering over 25,000 people from 32 locations around the world, Schroders highlights that 60% of respondents believe that their investment choices can have an impact and contribute to building a more sustainable world, and 61% are in favor of considering sustainability factors in all funds.¹

¹ [Global Investor Study 2019: Are people being encouraged to invest sustainably?](#), Schroders, 2019

However, financial incentives still outweigh sustainability: avoiding losing money and meeting return expectations remain the main objectives. The short-term focus on single stock performance could conflict with achieving sustainability objectives.

In response to this growing appetite for “sustainable” financial products, asset managers diversified their ESG offerings, resulting in significant growth of the ESG market ([Hecker and Dubourg](#)).

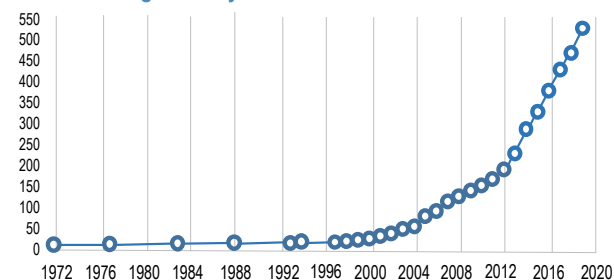
Regulators want to mobilize saving towards sustainability goals, while protecting retail investors against green-washing

Responsible Investment regulations are creations of the 21st century: 97% of regulations were created after the year 2000. While the first growth phase was significant and lasted for a decade, a tipping point was reached in 2012, with a marked acceleration.

According to the PRI, further policies appear inevitable as we are moving from a sporadic adoption to comprehensive national sustainable finance strategies. Real-economy outcomes are the new focus for investors and policy-makers, who are willing to mobilize private investments towards the achievement of sustainability goals, such as the Paris Agreement and the UN 2030 Agenda for Sustainable Development.

Regulatory actions are likely to bring more clarity to the fast-growing ESG market to protect private investors from aggressive marketing tactics which boast bold environmental and social benefit claims for investments funds, carrying the risk of not being fully aligned with effective ESG integration into investment processes.

Figure 1: Policy interventions on responsible investment accelerated significantly since 2012



Source: PRI

To achieve these objectives, we expect regulators to adopt a balanced approach, i.e., leveraging existing market practices through consultations and other forms of collaborative policy-making, without losing sight of the benefits associated with increased standardization and rigor.

Drivers of ESG markets vary depending on geographies

The relative importance of each stakeholder for the development of the ESG market varies depending on geographies. In the US, the development of ESG has been mostly market-driven, with limited “hard laws” to date. The US Congress only held its first hearing on ESG issues in 2019, considering proposals from Democrats in response to investors and organizations with more of \$5trn of AUM who petitioned the SEC to develop a common framework for issuers to publish ESG data.

In **Asia**, the development of the ESG market has been supported by a combination of public and private forces, with a prominent role played by large asset owners in Japan, and most recently Thailand. The development of a robust market for ESG investments represents both an opportunity to attract foreign capital, but also to respond to a strong demand from retail investors. However, the focus of existing regulatory initiatives remains on increasing disclosure based on “comply or explain” principles. Improving the quality of available data will be key to support the long-term development of the Asian ESG market.

In **Europe**, the development of the ESG market has been driven by a mix of soft and hard laws, with some countries championing the market, such as the French Art. 173 law, which introduced a mandatory disclosure requirement on climate risks for asset owners. However, the ongoing legislative process at the EU Level, the EU Action Plan on Sustainable Finance, needs to be monitored closely, as it is unprecedented in scope and ambitions, and could have far reaching implications for the ESG market, beyond the EU borders.

Why the EU Sustainable Finance Action Plan should be monitored closely

The EU Sustainable Finance Action Plan (EU SF AP) is derived from the commitments taken by the EU as part of the Paris Agreement and the UN SDG agenda. As such, it is not only focusing on managing risks but also on delivering real world outcomes that would be considered

sustainable. The Action Plan, which was first published in March 2018, defined three objectives and 10 actions (Figure 2; for more details, see also Table 1 near the end of this chapter).

Figure 2: 10 actions to deliver on the three objectives set

Reorienting capital flows towards more sustainable activities, in order to achieve sustainable and inclusive growth

- Action 1: Establishing an EU classification system for sustainable activities
- Action 2: Creating standards and labels for green financial products
- Action 3: Fostering investment in sustainable projects
- Action 4: Incorporating sustainability when providing financial advice
- Action 5: Developing sustainability benchmarks

Mainstreaming sustainability into risk management, to manage financial risks stemming from climate change, environmental degradation and social issues

- Action 6: Better integrating sustainability in ratings and market research
- Action 7: Clarifying institutional investors' and asset managers' duties
- Action 8: Incorporating sustainability in prudential requirements

Fostering transparency and long-termism in financial and economic activity

- Action 9: Strengthening sustainability disclosure and accounting rule-making
- Action 10: Fostering sustainable corporate governance and attenuating short-termism in capital markets

Source: J.P. Morgan, EC

Phase 1 of the EU SF AP delivered concrete steps forward

We believe that Phase 1 of the EU SF AP has delivered concrete steps, especially on Action 1 (Taxonomy), Action 2 (Green Bonds Standards, EU Ecolabel), Action 5 (Sustainability benchmarks), Action 7 (Clarifications of investors' duties and related disclosure). We summarize key takeaways below. However, as announced in December 2019 / January 2020 in the wake of the

² Financial market participants are defined in Article 2 (a) of the Commission proposal for a Regulation on disclosures relating to sustainable investments and sustainability risks and amending Directive (EU) 2016/2341 as “an insurance undertaking which makes available an IBIP, an AIFM, an investment firm which provides portfolio management, an IORP or a provider of a pension product; (ii) a manager of a qualifying venture capital fund registered in accordance with Article 14 of Regulation (EU) No 345/2013; (iii) a manager of a qualifying social entrepreneurship fund registered in

European Green Deal, the EU started Phase 2. The Renewed Sustainable Finance Strategy should be presented in 3Q20. Phase 2 will be pivotal to the advancement and finalization of all actions.

Action 1: EU Taxonomy of sustainable activities: This action point was described as the “most important and urgent action” of the EU SF AP and an important aspect of the Green Deal Package. A political agreement was reached in December 2019 on a regulation establishing a framework to facilitate sustainable investment. As a first step, the regulation defines a set of criteria to determine the conditions under which an economic activity can be considered “environmentally sustainable.”

Figure 3: Sustainable economic activities must comply with three types of technical screening criteria



Source: European Commission

Under this regulation, any financial market participants (FMP)² offering financial products³ in the EU will have to make taxonomy disclosures. This is mandatory for certain types of products or offerings (those that have sustainable investment in their objective and those which promote E or S characteristics of the investment) and on a comply-or-explain basis for all others. For relevant products, FMP should disclose the extent to which the taxonomy is used to determine the sustainability of the underlying investments, the environmental objectives to which the investment contributes, and the proportion of underlying investments that are taxonomy-aligned.

accordance with Article 15 of Regulation (EU) No 346/2013; (iv) a UCITS management company.”

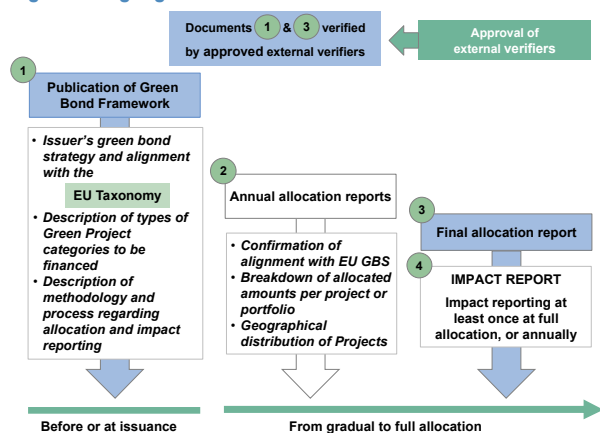
³ Financial products are defined in Article 2 (j) of the Commission proposal for a Regulation on disclosures relating to sustainable investments and sustainability risks and amending Directive (EU) 2016/2341 as “a portfolio management, an AIF, an IBIP, a pension product, a pension scheme or a UCITS.”

Several details on “technical screening criteria” remain to be defined in upcoming “delegated acts” from the European Commission, which will occur in two phases at the end of 2020 and end of 2021. We expect these delegated acts to draw upon the final report of the Technical Expert Group (TEG) published on 9 March 2020, with further consultations and inputs from the “Platform on Sustainable Finance” that will be created by autumn 2020. The first investor disclosures and company reports are due at the start of 2022.

As a follow-up to the taxonomy, and recognizing the obstacles posed by the current standards of non-financial reporting, a consultation has been launched on the revision of the Non-Financial Reporting Directive, which we believe represents a significant opportunity for ESG investing, as this revision could accelerate access to more standardized, better quality ESG data.

Action 2: Green Bond Standard and EU Ecolabel for financial products: The two main elements—EU Green Bond Standard (GBS) and EU Ecolabel for Retail Financial Products—are still under discussion, even though we believe that the EU GBS is more advanced. Indeed, the TEG published its final Green Bond Standard report in June 2019, recommending a “voluntary” standard, with the definition of “eligible projects” directly related to the EU Taxonomy, making its application dependent on the timing of the taxonomy. Moreover, in a “usability guide” published in March, the TEG indicated that the EU may envisage turning the Green Bond Standards into legislation. The topic is included as part of the current consultation process on the next phase of the EU SF AP.

Figure 4: Highlights of the EU Green Bond Standard



Source: European Commission

The EU Ecolabel is still in the process of being finalized, following the publication of draft versions, and subject to consultation and stakeholders’ feedback. According to industry media and Responsible Investors, the EU has been facing significant pressure to change the Ecolabel rule to ensure large adoption (hence avoiding the fate of the French “Greenfin” label, the stringency of which condemned it to a low level of adoption). To be included in funds with the EU Ecolabel, stocks will have to be assessed through the lens of metrics such as the percentage of green revenues and the level of green capex. However, the eligibility thresholds per stock and within pockets of a fund remain to be defined. The EU has commissioned two German bodies with climate expertise to assess 100 real life green UCITS funds to determine the current thresholds usability. Results are expected in June 2020.

Action 5: Developing Sustainability benchmarks: The final regulation on sustainable benchmarks was published in November 2019. It introduced minimum ESG and sustainability reporting requirement for benchmarks (excluding currency and interest rate benchmarks), including reporting on the “temperature pathway” embedded in the benchmark, and creating two new types of benchmarks: the EU Climate Transition Benchmarks and the EU Paris Aligned Benchmarks. Similar to the EU taxonomy regulation, while Level 1 regulations are finalized, Level 2 technical standards are still in the process of being drafted. In March, the EC opened consultations on draft texts for these delegated acts. The methods to measure the carbon profiles of the companies remain fiercely debated. It is interesting to note that even though the details are still being debated, a significant part of the benchmark regulation, including the reflection of ESG factors in benchmarks characteristics and marketing of new climate benchmarks, entered into force as of 30 April 2020, while other regulations (2°C alignment) will only be required as of December 2021. However, the ESMA indicated that national bodies should not prioritize enforcement actions against benchmark providers if details remain uncertain.

Action 7: Clarifying institutional investors’ and asset managers’ duties. This action point was split into various legislations, including creation of new regulations on disclosure obligations for investors, and amendments to existing regulations. With regards to disclosure, the finalized regulations were published in December 2019. This regulation amends the directive (EU) 2016/234 and introduces new disclosure obligations for institutional investors and asset managers. Starting 10 March 2021,

pension funds, insurers, asset managers, UCITS and other financial market participants will have to disclose how sustainability criteria affect financial returns and how this is managed and the impact of their investment decision on sustainability. Financial market participants and advisers will be subject to additional disclosure obligations to ensure that financial products promote environmental and social characteristics, or adhere to sustainable investment in their objectives. Details remain to be defined. In the regulation, six sets of entity-level and product-level specific standards and recommendations need to be defined. A consultation was launched in March by EU Supervisory Authorities. This new disclosure requirement should go hand in hand with the upcoming revisions of the Non-Financial Reporting Directive. On investor duties, a consultation on amending directive such as UCITS, AIFM, Solvency II, MiFID II to incorporate sustainability should soon be launched, according to a communication made by the European Commission to Responsible Investors.

This last point directly relates to **Action 4: Incorporating sustainability when providing financial advice**. On this Action, the Commission had conducted a consultation on amendments to delegated acts under the MiFID II and Insurance Distribution Directive (IDD), to include ESG considerations into the advice that investment firms and insurance distributors offer to individual clients. Requests for advice were sent to EIOPA (the EU Pension and Insurance regulator) and ESMA (European Securities and Market Authority). Draft amendments to the delegated acts under MiFID II and the IDD were then agreed, creating the requirement to consider a client's sustainability preferences as part of the suitability assessment. Details are expected to be finalized in 2020.

On the road towards Phase II of the EU Sustainable Finance action plan

Additional original action points have been less developed other the past two years. For example, **Action 3: Fostering investment in sustainable projects** did, to our knowledge, not give birth to any specific action, although this action point directly relates to issues identified by the EU High-Level Expert Group on Sustainable Finance dating back to 2017 that the lack of project development capacity limits the supply of sustainable infrastructure activities. In our view, the Green Deal and the development of the EU taxonomy should help to address this issue.

Work is also still ongoing on **Action 6: Better integrating sustainability in ratings and market research**. So far, this action point had focused on two types of actors: Credit

rating agencies (CRAs) and "Data providers" (especially ESG rating agencies). In July 2019, the ESMA published its technical advice and final guidelines on disclosure requirements on sustainability considerations. While it encouraged better and harmonized disclosure on how CRAs consider ESG, ESMA decided not to amend the CRA regulation to explicitly mandate the inclusion of sustainability characteristics assessments. Note, however, that there seems to be a market demand for ESG-based credit ratings. Indeed, the firm Beyond Ratings, which specializes in ESG analysis, was accredited as a CRA by the ESMA in March 2019. (However, the firm was later acquired by the London Stock Exchange Group in June 2019, and the ESMA withdrew the CRA registration of Beyond Ratings in July 2019.) Regarding sustainability data providers, the EU appointed a consultancy to advise on whether or not action was required. We note that in February 2020, the chair of the ESMA stated that ESG ratings should be regulated and supervised. While this reflected his personal views, we think that "ESG rating agencies" will be under increased scrutiny in the coming years. This scrutiny won't be limited to ESG data providers, and other parts of the ESG research value chain (including Sell-Side research or NGO types of research providers) are likely to be subject to further regulation.

Future regulation could potentially include **Action 9: Strengthening sustainability disclosure and accounting rule making** and **Action 10: Fostering sustainable corporate governance and attenuating short-termism in capital markets**. To date, the EU has limited its action to seeking advice from the European Supervisory Authorities. Last but not least, further work can be expected from the EU on **Action 8: Incorporating Sustainability in prudential requirements**, which remains in a preliminary phase of development, although the EC has selected BlackRock to advise on the potential revision of banking rules.

COVID-19 likely to be a catalyst for a green and sustainable transition in Europe

Simply looking at the number of consultations on key sustainable finance initiatives that were held in March and April, it is clear that the COVID-19 crisis won't slow work within the EU on Sustainable Finance regulations. Phase II (Renewed Strategy) is already being prepared, and the EU Commission opened a 100+ questions survey for consultation on a range of topics, including biodiversity, fair transition, ESG and passive investment, ESG factors and directors' pay packages, and even the regulation of the nascent sustainability-linked loan

market. These detailed consultations are directly related to the European Green Deal that was communicated in December 2019, and the related investment plan (Sustainable Europe Investment Plan) announced in January 2020, whose objective is to mobilize EUR1trn of sustainability investments over the next decade.

Figure 5: The Green Deal includes both financial and economic reforms

Finance reform	Economic reforms
- Sustainable Europe Investment Plan	- Rapid decarbonization of energy systems
- Renewed Strategy on Sustainable Finance	- Innovation in sustainable industry
	- Large-scale renovation of existing buildings
	- Development of cleaner public and private transport
	- Progress towards sustainable food systems

Source: European Commission

Table 1: Implications of European Commission's Action Plan for sustainable growth

The European Commission's Action Plan: Financing Sustainable Growth

- The "European Commission's Action Plan: Financing Sustainable Growth" embodies the EU's ambition to achieve the 2015 Paris Agreement and the UN 2030 Agenda for Sustainable Development, reflected within the 17 UN Sustainable Development Goals.
- The Action Plan, structured within 10 "Action" initiatives, is all-encompassing in mobilizing the financial sector in catalyzing the EU's transition towards a climate-neutral economy by 2050.

Action 1: EU Sustainable Taxonomy

- The EU Sustainable Taxonomy, the cornerstone of the EC's Action Plan, represents an agreed definition of sustainable investment, founded on defining the economic activities and the environmental performance that must be met to achieve sustainable objectives.
- With its implementation expected in early 2022, the EU Sustainable Taxonomy's framework offers investors the opportunity to calculate their portfolio's total exposure to taxonomy-eligible assets, while also enabling comparability between investment portfolios.

Action 2: Standards and Labels

- The EU Standards & Labels for sustainable financial products aims to protect the integrity of and trust in the sustainable financial markets, as well as enable easier access for investors seeking those products.
- The proposed Standards & Labels will facilitate channeling more investments into green projects and would constitute a basis for the development of reliable labelling of financial products. This aims to be particularly useful for retail investors.

Action 3: Facilitating Investment in Sustainable Infrastructure Projects

- Fostering investment in sustainable projects seeks to increase and improve advisory and technical assistance in order to scale a larger pipeline across the spectrum of needed sustainable projects in the EU and partner countries.

Action 4: Investment Advice to Integrate ESG

- Action 4 seeks to include the consideration of sustainability preferences alongside the traditional investment objectives and risk appetite of investors and beneficiaries, thereby reorienting the financial system towards further sustainability.
- MiFID II and IDD were amended in Q2 2018 so to ensure such sustainability preferences were integrated within financial advisory.

Action 5: Developing Sustainability Benchmarks

- The EU Sustainable Benchmark initiative seeks to establish two new types of sustainable benchmarks, namely "EU Climate Transition Benchmarks" and "EU Paris-aligned Benchmarks," in order to harmonize the current fragmentations in ESG Benchmarks.
- The methodologies used for the two sustainable benchmarks are founded on science-based decarbonization trajectories and on overall alignment with the objectives of the 2015 Paris Agreement, respectively.

Action 6: Credit Ratings to Integrate ESG

- Since the consideration of sustainability factors within credit ratings is relatively opaque, the EC seeks greater understanding and transparency by promoting solutions that would ensure that credit rating agencies sufficiently integrate sustainability and long-term risks within their current assessment approaches.
- The EC sought out all relevant stakeholders in Q2 2018 in order to explore amending the Credit Rating Agency Regulation to further consider the integration of ESG factors within assessment processes.

Action 7: Investors' Duty to Integrate ESG and Increased Disclosure

- Action 7 aims to explicitly define and systematically integrate ESG factors within institutional investors and asset managers' fiduciary duty.

Action 8: Incorporating Sustainability in Prudential Requirements

- As banks, insurance companies, and pension funds offer a means in which the EU can narrow the external finance needed to transition the continent towards a climate-neutrality, it is imperative that such entities are fully considering their sustainability risks.
- Incorporating sustainability in prudential requirements calls for a better reflection of risks associated with sustainability in prudential regulation, whilst ensuring not to jeopardize the credibility of the current EU prudential framework.

Action 9: Strengthening Corporate Disclosure on Sustainability

Action 10: Fostering More Sustainable Corporate Governance

Source: J.P. Morgan

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J.P. Morgan Perspectives
18 May 2020

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In the introduction of its consultation, the EU notes that the COVID-19 outbreak highlights the critical need to strengthen the sustainability and resilience of societies, and the ways in which economies function, by addressing the multiple and often interacting threats to ecosystems and wildlife and to buffer against the risks of future pandemics. The EU will build on the 10 action points from Phase 1, while accelerating the shift of the financial sector towards sustainability.

While no similar trend can be observed in the US, where the ESG investing trend remains led by private actors (e.g., Business Roundtable) we expect the EU regulation to have a large echo in Asia, as market participants are in search of sustainability standards to build upon. Different approaches will be taken since Japan is working on its own Green Taxonomy, but there could be some commonalities. We expect a “common but differentiated responsibility” approach that paves the way towards further collaboration on gap analysis and standardization of “Green” taxonomies and sustainable finance policies. In our view, the International Platform on Sustainable Finance (IPSF), which was launched by the EU in October 2019, could be an interesting arena for these discussions to advance.

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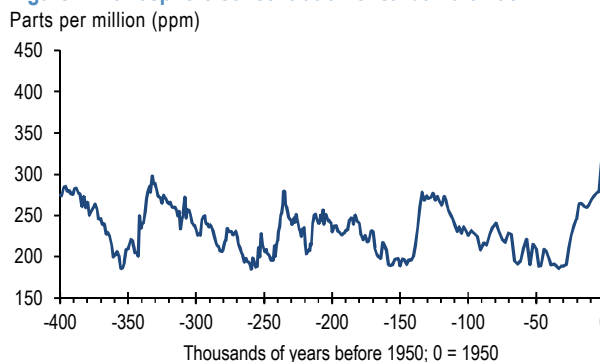
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Climate change: a key defining feature of the coming decades

- **Climate change is a slow-moving process, but it is no less dangerous for that. It is likely to be one of the key defining features of the coming decades.**
- **Increases in the global average surface temperature affect the earth's climate system, and this system is complex, non-linear and dynamic.**
- **If no new policies are enacted relative to what was legislated in 2017, this would likely mean a global temperature increase of around 3.5°C at the end of the century relative to pre-industrial times.**
- **The challenge is to determine the pace of the change and the extent of the damage that climate change will inflict. Only then can decisions be made about appropriate changes, either to adapt to climate change or to mitigate to reduce emissions.**

In the 800,000 years prior to the industrial revolution, the atmospheric concentration of CO₂ oscillated in a range from 170ppm (parts per million) to 300ppm. This ebb and flow in CO₂ emissions was mainly driven by volcanic activity and ocean fissures. Since the industrial revolution, CO₂ concentrations have climbed dramatically to the current level of around 410ppm (Figure 1).¹ This increase in CO₂ concentrations reflects the burning of fossil fuels for electricity generation and transportation, industrialization, and changes in agriculture and land use (deforestation).

Figure 1: Atmosphere concentration of carbon dioxide



Source: See footnote 1; J.P. Morgan

There has been a relatively close relationship between CO₂ concentrations and temperature over the last 800,000 years (Figure 2).² These long-run estimates of CO₂ concentrations and temperature are based on ice core data from Antarctica, so they are not estimates of global conditions. But the impression is very strong. Over the last 800,000 years, through to the middle of the 19th century, as CO₂ concentrations oscillated in a 170ppm to 300ppm range, the Antarctic temperature oscillated in a range from -3.5°C to +6.3°C (relative to the average temperature over the last 1000 years).

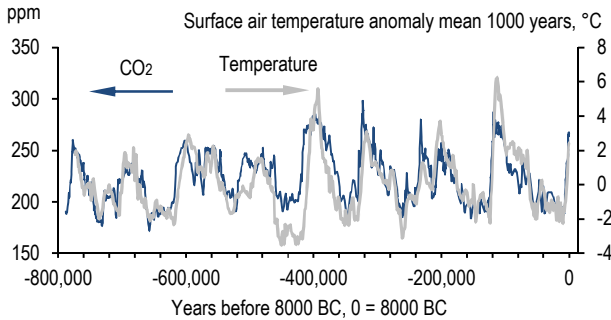
More recent data indicate that the increase in the global average surface temperature since pre-industrial times has been around 1°C (Figure 3).³ This has been associated with a rise in CO₂ concentrations from 280ppm to around 410ppm. However, given the long lags between emissions and temperature, the global temperature will keep rising in the coming decades even if CO₂ concentrations are stabilized at current levels.

¹ Lüthi et al., [High-resolution carbon dioxide concentration record 650,000-800,000 years before present](#). *Nature*, Vol. 453, pp. 379-382, 15 May 2008.; Petit et al., [Climate and atmospheric history of the past 420,000 years from the Vostok ice core, Antarctica](#), *Nature* 399: 429-436.; C. D. Keeling et al., [Exchanges of atmospheric CO₂ and ¹³CO₂ with the terrestrial biosphere and oceans from 1978 to 2000. I. Global aspects](#), SIO Reference Series, No. 01-06, Scripps Institution of Oceanography, San Diego, 88 pages, 2001.

² Lüthi et al., [High-resolution carbon dioxide concentration record 650,000-800,000 years before present](#). *Nature*, Vol. 453, pp. 379-382, 15 May 2008; Friedrich, T. et al., [Nonlinear climate sensitivity and its implications for future greenhouse warming](#), *Science Advances*, Vol. 2, 2016

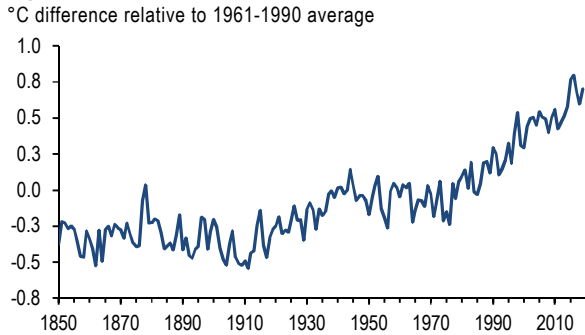
³ C.P. Morice, J. J. Kennedy, N. A. Rayner, and P. D. Jones, [Quantifying uncertainties in global and regional temperature change using an ensemble of observational estimates: The HadCRUT4 dataset](#), AGU, 17 April 2012

Figure 2: CO₂ concentration and temperature over 800,000 years



Source: See footnote 2; J.P. Morgan

Figure 3: Global mean temperature anomalies



Source: Footnote 3; J.P. Morgan

Increases in the global average surface temperature affect the earth’s climate system. This system is complex, non-linear and dynamic. It is helpful to think of the climate as the probability distribution of weather outcomes.⁴ Each day’s weather comes from this distribution. In fact, the climate system covers more than what we normally think of as the weather—temperature, precipitation, wind, cloudiness and storms. It also covers complex features such as snow and ice cover, the sea level, atmospheric and ocean circulation patterns (such as the Gulf Stream and the El Niño Southern Oscillation). All of these interact in complex, non-linear, and dynamic ways. Of particular importance are positive feedback mechanisms which create amplification in response to initial shocks. Due to this complexity, climate models, even if they are huge, do not fully capture everything that is going on.

If we think of the climate as a probability distribution covering weather and these other aspects, climate change

⁴ Auffhammer, M., *Quantifying economic damages from climate change*, JEP, Fall 2018

⁵ Analysis of climate change either focuses on all greenhouse gases (GHG) measured in CO₂ equivalents or just carbon dioxide. In this note we focus mainly on CO₂. Other GHG include methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.

refers to a shift in the moments of this probability distribution. What matters is not simply the mean and variance, but also the skewness and kurtosis. Skewness and kurtosis determine the fatness of the tails—the likelihood of low-probability, extreme events.

The Paris agreement on climate change, adopted in December 2015, has a central objective of limiting the rise in the global temperature “to well below 2°C above pre-industrial times, and to pursue efforts to limit the temperature increase even further to 1.5°C.” This objective is to be met by the end of the century. Given that the rise in atmospheric CO₂ has already increased the global temperature by around 1°C relative to pre-industrial times, and there is a lagged effect still to come, these Paris objectives look challenging, especially with the US’ stated intention to leave the Paris Accord (Table 1, RCP8.5 is a BAU pathway).

Global greenhouse gas (GHG)⁵ emissions in 2017 were around 52GtCO₂eq (gigatonnes of CO₂ equivalent). If no new policies are enacted relative to what was legislated as of the end of 2017, emissions would rise to 60GtCO₂eq by 2030 and 70GtCO₂eq by the end of the century (Figure 4, Business-as-usual (BAU) scenario). This would likely mean a global temperature increase of around 3.5°C at the end of the century relative to pre-industrial times. To achieve the Paris objective of limiting the temperature increase to below 2°C (with a 67% likelihood), global GHG emissions would have to fall to 42GtCO₂eq by 2030 and to minus 4GtCO₂eq by the end of the century. To achieve the Paris objective of limiting the temperature increase to 1.5°C (with a 50% likelihood), global emissions would need to decline to 39GtCO₂eq by 2030 and minus 10GtCO₂eq by the end of the century.⁶

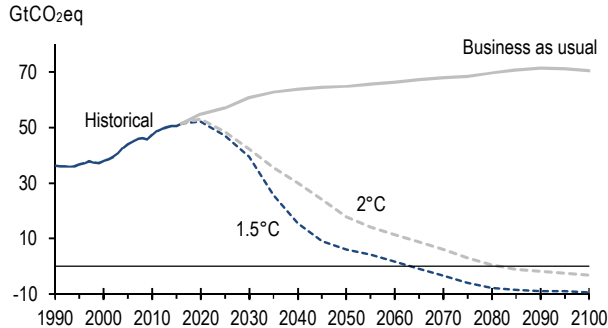
Table 1: IPCC Representative Concentration Pathways (RCPs)

	CO ₂ concentration ppm	Temperature °C	Sea level m
RCP 2.6	420	1.0 (0.3-1.7)	0.4
RCP 4.5	650	1.8 (1.1-2.6)	0.5
RCP 6	850	2.2 (1.4-3.1)	0.5
RCP 8.5	1370	3.7 (2.6-4.8)	0.6

Source: IPCC

⁶ Keramida, K., Tchung-Ming, S., Diaz-Vazquez, A.R., Weitzel, M., Rey Los Santos, L., Wojtowicz, K., Schade, B., Saveyn, B., Soria-Ramirez, A., *Global Energy and Climate Outlook 2018: Sectoral mitigation options towards a low-emissions economy*, European Commission, 2018

Figure 4: Global greenhouse gas emissions



Source: See footnote 6; J.P. Morgan

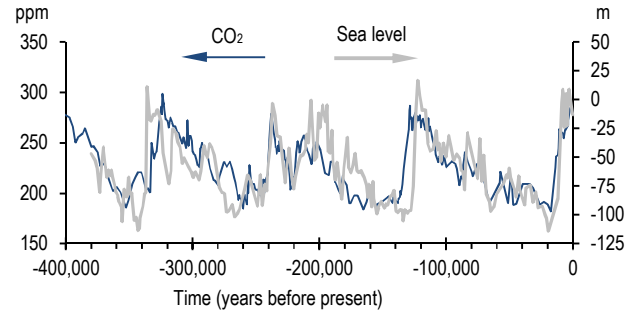
CO₂ emissions dominate overall GHG emissions, accounting for almost 70% of total emissions. CO₂ emissions—generated by power production, industry, transport, agriculture and deforestation—are currently on an unsustainable trajectory (Table 2). If no steps are taken to change the path of emissions, the global temperature will rise, rainfall patterns will change creating both droughts and floods, wildfires will become more frequent and more intense, sea levels will rise, heat-related morbidity and mortality will increase, oceans will become more acidic, and storms and cyclones will become more frequent and more intense (Figures 5⁷ and 6⁸). As these changes occur, life will become more difficult for humans and other species on the planet.

Table 2: Global greenhouse gas emissions to meet Paris 2°C objective

GtCO ₂ eq (gigatonnes of CO ₂ equivalent)	2010	2020	2030	2050
Total GHG emissions	47.5	53.0	42.2	17.9
CO ₂ emissions from fuel combustion	30.7	35.4	29.7	12.1
Power generation/district heating	11.6	13.5	9.4	2.0
Industry	6.1	6.4	6.0	2.3
Buildings	2.9	2.9	2.4	1.4
Agriculture	0.4	0.5	0.4	0.2
Transport	7.1	8.6	7.9	4.0
Other	2.6	3.6	3.6	2.2
CCS (CO ₂ captured)	0.0	0.0	0.0	1.2

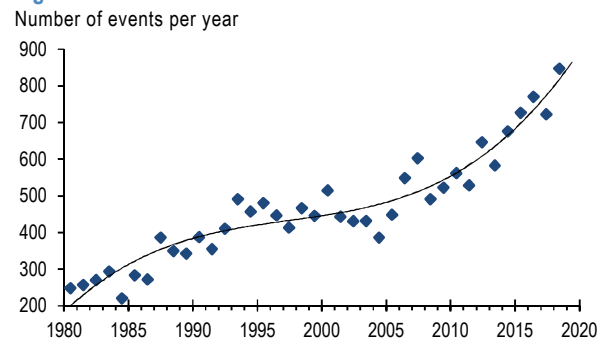
Source: Tchung-Ming, S., Diaz-Vazquez, A. R., Keramidas, K., Global Energy and Climate Outlook 2018: GHG and energy balances 2018 GHG and energy balances – Supplementary material to “Global Energy and Climate Outlook 2018: Sectoral mitigation options towards a low-emissions economy.” EUR 29573 EN, Publications Office of the European Union, Luxembourg, 2018, J.P. Morgan.

Figure 5: CO₂ and sea level over the past 400,000 years



Source: See footnote 7; J.P. Morgan

Figure 6: Worldwide extreme weather events



Source: NatCatService, Munich Re; J.P. Morgan; See footnote 8.

Although the direction of travel is clear, the challenge is to determine the pace of the change and the extent of the damage that climate change will inflict. Only then can decisions be made about appropriate changes, either to adapt to climate change or to mitigate to reduce emissions. Unfortunately, decision making is hard because uncertainty pervades the world of climate change, in four key ways.

First, there is uncertainty about the path of emissions. Population and economic growth are key drivers of emissions. Uncertainty about population growth is due to wide ranges for fertility and longevity (see [Climate change and uncertainty: A huge issue](#), D. Mackie, 11 July 2019). Uncertainty about growth in GDP per capita is due to wide ranges for productivity growth (driven by technical change, institutions and structural policies).

⁷ [Sea-level fluctuations during the last glacial cycle](#), M. Siddall, E. J. Rohling, A. Almogi-Labin, C. Hemleben, D. Meischner, I. Schmelzer, D. Smeed, *Nature*, Vol. 423, pp. 853-858, 2003.

[Climate and Atmospheric History of the Past 420,000 years from the Vostok Ice Core](#), J.R. Petit, J. Jouzel, D. Raynaud, N.I. Barkov, M. Delmotte, V.M. Kotlyakov, M. Legrand, V. Lipenkov, C. Lorius, L. Pépin, C. Ritz, E. Saltzman, M. Stievenard, *Antarctica, Nature*, 399, pp.429-436, 1999.

⁸ Extreme events include geophysical, meteorological, hydrological and climatological events that “have caused at least one fatality and/or produced normalised losses ≥US\$ 110k, 300k, 1m or 3m (depending on the assigned World Bank income group of the affected country),” Munich Re, 2019.

Uncertainty about the path of emissions also relates to the role of technology in improving both the energy efficiency of economic activity and the CO₂ intensity of energy production (principally electricity).

Second, there is uncertainty about the impact of CO₂ concentrations on the global temperature. The key issue here is the value of the Equilibrium Climate Sensitivity (ECS), which predicts the change in the global average surface temperature for each doubling of CO₂ concentrations in the atmosphere. There is huge uncertainty about the mean of this probability distribution and the shape of the distribution around the mean. Of particular importance is the fatness of the tails.

Third, there is uncertainty about the broader impact of rising temperatures on other aspects of the climate, e.g., the frequency and intensity of extreme weather events and the rise in the sea level.

Fourth, there is uncertainty about how the change in the climate affects GDP and other important issues such as heat-related mortality and morbidity, famine, water stress, migration, conflict, species survival and biodiversity.

Clearly humans and other animals have adapted to live in pretty diverse parts of the world with very different climates. The issue now is the pace and magnitude of the upcoming change in the climate. Due to the impact of human activity, atmospheric CO₂ concentrations are increasing at a faster pace than ever seen before and the climate is responding accordingly. Although precise predictions are not possible, it is clear that the earth is on an unsustainable trajectory. Something will have to change at some point if the human race is going to survive.

The response to climate change should be motivated not only by central estimates of outcomes but also by the likelihood of extreme events (from the tails of the probability distribution). We cannot rule out catastrophic outcomes where human life as we know it is threatened.

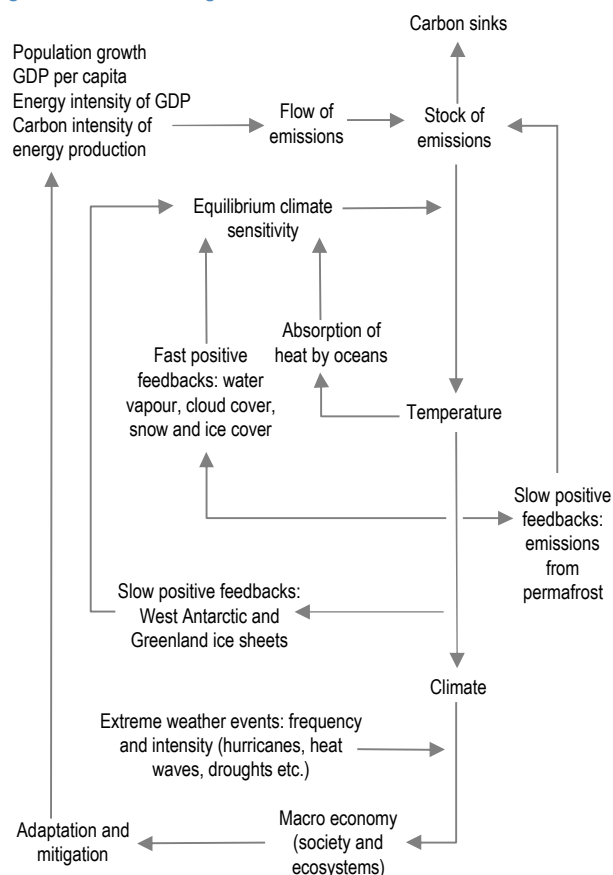
To contain the change in the climate, global net emissions need to reach zero by the second half of this century. Although much is happening at the micro level, it is hard to envisage enough change taking place at the macro level without a global carbon tax.

However, this is not going to happen anytime soon. Developed economies, who are responsible for most of the cumulative emissions, worry about competitiveness and jobs. Meanwhile, Emerging and Developing

economies, who are responsible for much less of the cumulative emissions, still see carbon-intensive activity as a way of raising living standards. It is a global problem but with no global solution in sight.

Figure 7 illustrates how human activity influences the climate, and then how the climate influences human activity. For more details, please see our special report, [Risky business: the climate and the macroeconomy](#), D. Mackie and J. Murray, 14 January 2020.

Figure 7: Climate Change Process



Source: J.P. Morgan

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Climate change and central banks: a conceptual framework

- **Theoretically, central banks could do a lot to help manage climate change...**
- **...By supporting the fiscal authorities and influencing the relative prices of financial assets.**
- **But there is a limit to expansionary policy due to the productive capacity of the economy.**
- **A huge issue is central bank independence and accountability: politicians need to be involved.**

There is a growing debate about what role central banks should play in the climate change process. At the moment, independent central banks use monetary policy to respond to demand, supply and financial shocks which threaten to move the economy away from full employment and price stability. How does climate change fit into this framework?

Climate change is a slow moving, multi-decade process, which creates challenges for central banks that normally work at a business cycle frequency. Nevertheless, in the climate literature, two types of risks are considered relevant for central banks. The physical risks of too little climate mitigation and the transition risks from rapidly moving to a low carbon economy.¹

Physical risks refer to the impact of unmitigated climate change on the economy: the impact of increased temperatures, more frequent and more intense storms, heat waves, droughts and tropical cyclones and sea level increases. These developments will damage labor productivity, labor supply, agricultural output, water supply, homes, other buildings and transport infrastructure. There will be both insured and uninsured losses. Climate change can also create stress on populations, due to food and water shortages, which will likely lead to political instability, conflict and large-scale migration. However, these are likely to be slow-moving changes.

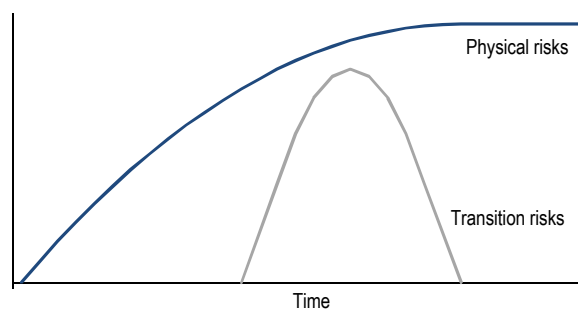
An ambitious transition to a low-carbon economy, possibly only occurring after a buildup of physical risk changes public opinion, and possibly triggered by a significant carbon tax, would involve a huge amount of investment to transform the electricity generation sector

¹ For a clear discussion of these risks see: S. Batten, R. Sowerbutts, and M. Tanaka, [Climate change: Macroeconomic](#)

from fossil fuels to renewables, to restructure the distribution grid, to electrify the transportation sector, to change industrial processes such as steel and cement production, to better insulate homes and offices and to develop carbon capture and storage technology. In addition to new capital spending there could also be significant premature obsolescence of some of the existing capital stock. We have highlighted the importance of stranded fossil fuel assets (see [Climate change and fossil fuel stranded assets: A big deal?](#), D. Mackie and J. Murray, 30 Jan 2020), but the issue of stranded assets is much broader than this. For example, of the 26,603 Terawatt-hours of electricity generated in the world in 2018, 64% came from fossil fuels (oil, natural gas and coal). Some of this capital stock may have to be scrapped prematurely. In addition to power generation, other sectors facing potential problems are refining, metals, chemicals and transportation. This premature obsolescence may create financial market stress as banks and other investors recognize that their investments are worth less than originally anticipated.

It is important to recognize that physical risks are driven by the cumulative concentration of CO₂ in the atmosphere, rather than the flow of emissions each year (see [Risky business: the climate and the macroeconomy](#), D. Mackie and J. Murray, 14 Jan 2020). Most climate objectives aim to stabilize the concentration of atmospheric CO₂, which means that whatever new climate environment is generated will remain in place indefinitely. This means that physical risks and transition risks are likely to overlap for a period of time (Figures 1 and 2).

Figure 1: Physical and transition climate risks
Damages, \$

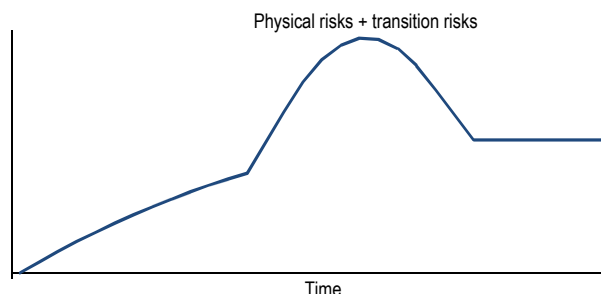


Source: J.P. Morgan

[impact and implications for monetary policy](#), Bank of England.

Figure 2: Total risks

Damages, \$



Source: J.P. Morgan

With significant physical and transition risks, the need to finance a huge amount of investment and the possibility of financial stress due to physical damage to, and premature scrapping of, the capital stock, what can central banks do to help? Quite a bit as it turns out, but it is important to recognize that their resources are not unlimited. This note lays out a conceptual framework for thinking about what central banks could do in theory. What they may do in practice will be the subject of further work.

A conceptual framework

This note extends a framework that we have laid out before when considering the benefits of monetary and fiscal policy coordination (see [Conscious coupling: Coordination in a world of constraints](#), B. Kasman et al., 3 August 2016) When considering the role of central banks in managing climate change, it is helpful to look at the budget constraints of the fiscal authorities, the central bank and the consolidated public sector (Figures 3 and 4). In order to keep things simple, we have ignored income generated from public sector asset sales, FX reserves and low-cost loans to banks and other financial institutions, but all of these can be incorporated into this framework.

Figure 3: Public sector budget constraints

Left hand side of equations are sources of funds and the right hand sides are uses of funds

Fiscal authority budget constraint:

$$T_t + S_t + (D_t - D_{t-1}) + (A_t - A_{t-1}) = G_t + r_{t-1}D_{t-1} + r_{t-1}A_{t-1}$$

Central bank budget constraint:

$$(M_t - M_{t-1}) + (R_t - R_{t-1}) + r_{t-1}A_{t-1} + d_{t-1}W_{t-1} = (A_t - A_{t-1}) + (W_t - W_{t-1}) + i_{t-1}R_{t-1} + S_t$$

Consolidated public sector budget constraint:

$$T_t + (D_t - D_{t-1}) + (M_t - M_{t-1}) + (R_t - R_{t-1}) + d_{t-1}W_{t-1} = G_t + (W_t - W_{t-1}) + r_{t-1}D_{t-1} + i_{t-1}R_{t-1}$$

Source: J.P. Morgan

Figure 4: Key for budget constraints equations

-
- G:** Primary expenditure
 - r:** Government bond yield
 - D:** Government debt held by the private sector
 - A:** Government debt held by the central bank
 - T:** Tax revenue
 - S:** Dividend from central bank to treasury
 - W:** Private sector financial assets
 - R:** Reserves
 - i:** Interest on reserves (policy rate)
 - d:** Dividend rate on private sector financial assets
 - M:** Banknotes
-

Source: J.P. Morgan

Each year, the fiscal authorities acquire resources through taxation (T), a dividend from the central bank (S) and the sale of debt instruments to either the private sector (D) or the central bank (A). The fiscal authority then uses these resources to finance primary spending (G) and debt servicing ($rD + rA$). From a macroeconomic perspective, counter-cyclical fiscal policy is generally implemented by adjustments in the balance between taxation (including the dividend from the central bank) and primary spending (which is both current and capital spending). While some of these adjustments are discretionary, the bulk of counter-cyclical fiscal policy represents “automatic stabilizers” as changes in the economy directly influence tax receipts and primary expenditure.

Meanwhile, the central bank acquires resources from the issuance of monetary liabilities—which are comprised of non-interest bearing liabilities in the form of banknotes (M) and interest bearing liabilities to banks in the form of reserves (R)—along with the interest receipts on their holdings of government debt (rA) and the income from holdings of private sector assets (dW). The central bank then uses these resources to acquire government debt (A)

and financial assets from the private sector (W), to pay interest on banks' holdings of reserves (iR) and to pay a dividend to the fiscal authority (S). Monetary policy to manage the business cycle involves setting the short-term interest rate on reserves (i) and expanding its balance sheet by creating reserves (R) in order to purchase government debt (A). Financial stability policy involves the creation of reserves (R) to purchase government debt (A) and private sector assets (W).

With interest paid on reserves, central banks set both the price and the quantity of high powered money (banknotes in circulation and banks' reserves with the central bank). The price of money is the interest rate that central banks set on reserves; banknotes are not interest bearing. It is important to recognize that while central banks decide on the overall amount of high powered money, it is the private sector that decides on the distribution between non-interest bearing banknotes and interest bearing reserves.

Applying the framework to climate change

The potential role of the central bank in the climate change story can be seen clearly from the consolidated public sector budget constraint, in four ways. First, to manage cyclical risks from physical and transitional changes, the central bank can set the interest rate on reserves and create reserves to purchase government debt. To the extent that additional support is needed, central banks can utilize other tools developed over the past decade: negative interest rates, forward guidance and low-cost loans to banks. The latter would be financed by the creation of reserves (R). Second, to the extent that there are financial stability issues caused by a rapid transition, the central bank can create reserves (R) to purchase government debt (A) and financial assets of the private sector (W). As we saw during the global financial crisis, financial markets can get very distressed and asset prices can fall to levels well below fair value. Central banks can both stabilize markets and make a profit. Third, central banks can expand and change the composition of their balance sheets to restrain or support specific sectors (creating R to buy more A and W and changing the composition of A and W to discourage carbon-intensive activities and to support carbon-neutral activities). This behavior will change the relative price of different financial assets which affects the cost of capital. Fourthly, to the extent that the government wants to expand public investment (G) to support the transition without raising taxes (T), the central bank can help finance this by creating reserves (R) to purchase the government debt that

would need to be issued (A). The benefit of this is that the central bank can prevent any crowding out, which otherwise might arise from an increase in market interest rates on government bonds. A substitution of reserves (R) for government debt (D) would also limit the risk of Ricardian equivalence where private saving rises to offset the fall in government saving.

The power of the central bank that comes from its ability to expand its balance sheet, and change its composition, looks enormous, and it is. However, it is important to recognize that it is not unlimited. Central banks have enormous power to stabilize financial markets, and provide a more conducive environment for a fiscal expansion, but there are no free lunches. Their true fiscal resources are limited to the net present value of seigniorage (the real resources that can be purchased by the creation of banknotes and by the regulations regarding reserve requirements on banks).

When the central bank finances government debt purchases with reserves, all it is doing is changing the maturity structure and nature of sovereign liabilities: from a market-based sovereign interest bearing debt instrument with a specific longer-term maturity to a non-market based shorter-term sovereign interest bearing liability with no specific maturity. Central banks can finance a fiscal expansion by purchasing government debt. But there is a limit to expansionary monetary and fiscal policy created by the capacity constraints of the economy. Once these are passed, inflation will rise.

This framework highlights that quantitative easing (QE) is not the monetary financing of a fiscal deficit, nor is it the monetization of debt, as long as an interest rate is paid on reserves that is consistent with the central bank's inflation objective. Rather, QE is a transformation of sovereign interest bearing liabilities, from debt to reserves. QE works through the portfolio rebalancing effects triggered by this transformation or through the signals it sends on the future course of monetary policy.

The central bank cannot finance government spending by the issuance of non-interest bearing banknotes unless it breaks the fungibility of banknotes and reserves. If this fungibility is broken, then the private sector can be forced to hold more non-interest bearing banknotes, but again there is a limit created by the capacity constraints of the economy. Once these are passed, inflation will rise.

Thus, it is the creation of inflationary pressure, whether through elevated utilization of available resources or an

upward move in inflationary expectations, which creates the constraint on what the central bank can do to assist in managing climate change. Central banks have enormous power to change the size and composition of their balance sheets, but the interest rate on reserves has to be set at an appropriate level to ensure macroeconomic balance (full employment and price stability). It is this which creates the limit on the central bank's ability to finance a fiscal expansion, whether for climate change or anything else.

Central bank balance sheets are very large at the moment, due to the aftermath of the global financial crisis and the COVID-19 crisis. But, this may not always be the case. This is not a problem, however, given the central bank's ability to determine both the price and quantity of high powered money. At any time, central banks can create reserves to buy financial assets. Again it is the requirement to set an appropriate interest rate on reserves to ensure macroeconomic balance that creates a constraint on the magnitude of the balance sheet expansion. If the interest rate on reserves goes up, central banks can create more reserves to pay interest on the existing reserves (see the central bank budget constraint in Figure 3). This mechanism is probably stable up to a point, but history suggests that if this process is extensive inflation expectations will rise.

Another channel that could create a constraint is the currency. Unilateral monetary and fiscal action could generate a sustained move in the currency, which could affect inflation and inflation expectations.

Nominal interest rates are very low at the moment due to a decline in the equilibrium real interest rate (r^*), which looks to have fallen by around 200 basis points over the past couple of decades, monetary support during the COVID-19 crisis, and a slide in inflation expectations. Given the slow-moving nature of developments in both r^* and inflation expectations, and the likelihood of a persistent drag from COVID-19, nominal interest rates are likely to remain low for an extended period. Prior to the COVID-19 crisis, it looked like a good time for central banks and fiscal authorities to coordinate a fiscal expansion to help mitigate climate risks. But such ideas have been somewhat overwhelmed by the monetary and fiscal expansion needed to support the economy in the face of the COVID-19 crisis. It is too early to know how the COVID-19 crisis will affect attitudes to climate change. In some sense the COVID-19 crisis shows the power of monetary and fiscal policy, and some argue that that this demonstrates room for a Green New Deal.

Policymakers at the moment are willing to ease monetary and fiscal policy aggressively due to the slack generated by the COVID-19 shutdown. In the face of slack, monetary and fiscal policymakers have a lot of room to maneuver. The key issue for the Green New Deal prior to the COVID-19 crisis was the absence of any slack in the economy. Only a few months ago, resource utilization rates looked stretched, especially in the labor market: unemployment rates in Developed Markets reached a 40-year low. In a pre-COVID-19 environment, a significant fiscal expansion, even if financed by the central bank, would have met the economy's capacity constraint and inflation would likely have risen.

Finally, central banks that have a financial stability responsibility can work in ways not covered in our simple framework. They could adjust capital requirements to lift the cost of capital for bank loans to carbon-intensive activities to help protect banks from the costs of physical and transition risks. This will be explored in future work.

Legitimacy and accountability

Over recent decades, central banks have been made operationally independent of the fiscal authorities due to the risk that politicians will misuse monetary policy for partisan political gain. The theoretical scope of monetary policy outlined in this note begs the questions of legitimacy and accountability. The current institutional framework is not set up for central banks to finance fiscal expansions or to change relative prices of green and brown financial assets. Decisions such as these should be taken by politicians who are directly accountable to the electorate. In principle, decisions can be delegated to the central bank, but this would entail a lot more political involvement than is normal in the current institutional set up.

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Europe in the lead on gender policy

- **Europe continues to lead the way in advancing gender equality, and the Council of Europe (CoE) has a dedicated Gender Equality Strategy in place to emphasize structural barriers to equality.**
- **The CoE has adopted a pioneering legal instrument to address sexism, namely a Recommendation that includes the first-ever legal definition of sexism.**
- **In the context of the Recommendation, European member states are invited to reflect on their current policies and legislative frameworks, and work on implementing existing tools or adding new measures, to combat sexist behavior, support victims and punish offenders of sexism.**

Europe: Latest policy initiatives and challenges governing gender equality

Europe continues to lead the way in advancing gender equality and the Council of Europe (CoE) has a dedicated Gender Equality Strategy (2018-2023)¹ in place to emphasize structural barriers to equality: institutional, legal, societal and attitudinal. See [“J.P. Morgan Perspectives: Achieving Gender Balance 2019: Progress, Opportunities and Challenges,” page 13](#), for a summary of the priorities of the current framework.

The Gender Equality Strategy might come under pressure from the political and economic environment, if resources for advancing gender equality become stretched under the realities of slower economic growth, cuts to funding, or shifting priorities of national governments. Meanwhile, economic uncertainty post the global financial crisis has unleashed a rising tide of nationalism and populism in Europe (and beyond), under which the human rights of migrant, refugee and asylum-seeking women and girls risk being compromised. The CoE strategy also recognizes emerging issues, such as the intersectionality of sexist discrimination (affecting, for example, women of ethnic minorities, LGBTQ+ people, women living in poverty, and women with disabilities), tackling emerging issues such as migration,

and addressing the misuse of the internet and social media as tools to perpetuate violence against women.

Since the publication of the Gender Equality Strategy 2018-2023, the CoE adopted a pioneering legal instrument to address sexism.² According to a CoE press release,³ the legal Recommendation (adopted by the CoE’s Committee of Ministers in March 2019) came in response to the #MeToo movement, as well as other social movements that have highlighted the prevalence of entrenched sexism within society. The Recommendation includes the first-ever legal definition of sexism, namely:

Any act, gesture, visual representation, spoken or written words, practice or behavior based upon the idea that a person or a group of persons is inferior because of their sex, which occurs in the public or private sphere, whether online or offline, with the purpose or effect of:

- violating the inherent dignity or rights of a person or a group of persons; or
- resulting in physical, sexual, psychological or socio-economic harm or suffering to a person or a group of persons; or
- creating an intimidating, hostile, degrading, humiliating or offensive environment; or
- constituting a barrier to the autonomy and full realization of human rights by a person or a group of persons; or
- maintaining and reinforcing gender stereotypes.

In the context of the Recommendation, European member states are invited to reflect on their current policies and legislative frameworks, and work on implementing existing tools or adding new measures, to combat sexist behavior, support victims and punish offenders of sexism. The CoE also calls on member states to monitor and report progress, in particular with regards to that of national legal policy frameworks to address sexism in public places, the media and internet, the workplace, public and private sector, the justice system, the education system, as well as in sport and culture.

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¹ Council of Europe Gender Equality Strategy, 2018-2023
<https://rm.coe.int/strategy-en-2018-2023/16807b58eb>

² See <https://rm.coe.int/prems-055519-gbr-2573-cmrec-2019-1-web-a5/168093e08c>

³ See <https://www.coe.int/en/web/genderequality/-/council-of-europe-adopts-first-ever-international-legal-instrument-to-stop-sexism>

Board representation in the lead on gender balance

- Over the past year, further progress has been made on diversifying boards and C-suites at companies around the world.
- The percentage of women on US corporate boards has increased across all sectors, with women accounting for 20.4% of director seats across Russell 3000 companies in 2019, up from 17.7% in 2018.
- Internationally, the share of women on corporate boards increased more sharply in 2019 than in the previous year, and the percentage of companies with all-male boards declined.
- However, women continue to make up a small fraction of corporate executives. Women accounted for 4.3% of CEO seats for the MSCI ACWI Index, up from 3.7% in 2018.
- The data show that mandatory gender quotas for corporate boards have led to higher female representation.
- Although there are no federal mandates for gender diversity on corporate boards in the US, several US states have followed California's lead and have taken steps to increase transparency around gender balance and to promote the inclusion of women in leadership positions.

The movement to improve gender equality continues to gain momentum, with advances in women's participation in the labor force, representation on corporate boards, and in the political arena. In our full report ([J.P. Morgan Perspectives: Achieving Gender Balance 2020: Why the Disparity?](#), Joyce Chang et al., 6 March 2020) on the progress towards achieving gender balance, we reviewed progress toward closing the gender gap. Over the past year, female representation on corporate boards has increased, while the representation of women in CEO-level positions is little changed and remains low in the mid-single digits. The gender pay gap remains persistent even though women tend to exhibit higher levels of educational attainment ([White](#)). Women remain at a significant disadvantage to men in accessing capital, credit, financial services, and property ownership. In our annual round-up of progress in achieving gender balance, we expanded our analysis to include an

assessment of women's vulnerability to climate change ([Murray](#)) and also provide an overview of noteworthy 2019-2020 surveys and indices covering gender-related advances.

Collecting data on gender diversity at the country- and company-level remains a challenge due to the lack of consistent data and policies. **The percentage of women on corporate boards remains the most commonly-used metric to measure gender balance, and we review the recent trends below.**

The share of women on boards of US companies continued to increase in 2019

In 2019, women held 20.4% of board seats at Russell 3000 companies, up from 17.7% in 2018 and 16.0% in 2017 (Table 1).

Table 1: The percentage of women on boards rose to 20.4% in 2019 for Russell 3000 companies, up 4.4%-pts from 2017...

Number of female directors and total directors on boards and percentage of female directors at Russell 3000 companies

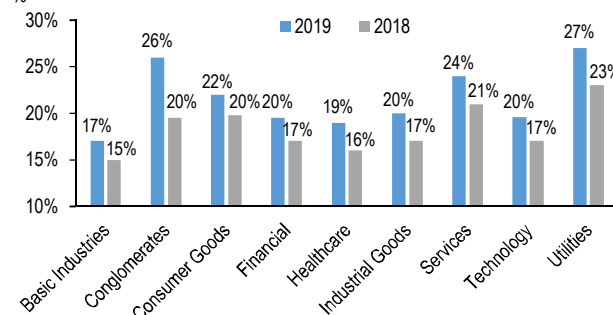
	2019	2018	2017
Total Women	5,252	4,477	4,082
Total Directors	25,754	25,250	25,510
% Women on Boards	20.4%	17.7%	16.0%

Source: [2020 Women on Boards Gender Diversity Index](#)

The number of female directors increased by 775 in 2019, while the total number of directors increased by 504, implying that some male directors were replaced by women.

Figure 1: ...and increased across all sectors

Percentage of Russell 3000 company board seats held by women by industry, %



Note: Yahoo Finance Industry Sectors provided by Equilar

Source: [2020 Women on Boards Gender Diversity Index](#)

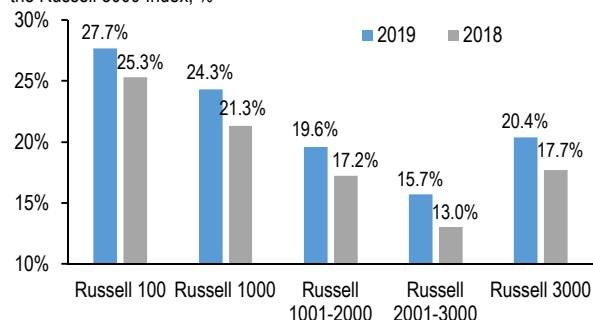
Looking more granularly, we find that the share of women on US boards increased across *all* sectors in 2019 (Figure 1). Utilities continued to have the highest share of female directors at 27%, while basic industries had the

lowest share (17%). Conglomerates saw the greatest increase in 2019, with the share of women on boards in this sector rising from 20% in 2018 to 26% in 2019.

Larger companies continue to lead the move toward greater board diversity. As Figure 2 shows, Russell 100 companies had the greatest share of female directors at 27.7%, well above the Russell 3000 index average of 20.4%. Companies of all sizes increased their share of women on boards in 2019, but small-cap companies (Russell 2001-3000) continued to lag behind.

Figure 2: Larger companies continue to lead the move toward greater board diversity

Percentage of board seats held by women broken down by company size on the Russell 3000 Index; %



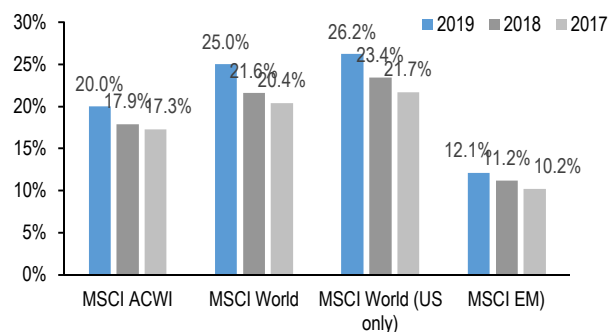
Source: [2020 Women on Boards Gender Diversity Index](#)

Globally, female board representation accelerated in 2019

Internationally, the share of women on corporate boards increased more sharply in 2019 than in the previous year. As Figure 3 shows, the percentage of female directors for the MSCI ACWI Index reached 20.0% as of October 31, 2019, an increase of over 2.0-pts.¹ However, this increase was largely driven by increased female board representation at the US constituents of the MSCI World Index (26.2% in 2019 versus 23.4% in 2018). EM companies continue to lag behind DM companies in terms of board diversity, with the share of women on corporate boards for MSCI EM only reaching 12.1% in 2019.

Figure 3: Globally, the share of women on corporate boards increased more sharply in 2019 than in the previous year, led by the US

Percentage of women on boards, 2017-2019; %



Note: The chart shows the percentage of director seats held by women in 2017, 2018 and 2019 among constituents of the MSCI ACWI Index, MSCI World Index, MSCI Emerging Markets Index (EM) and US-domiciled constituents of the MSCI World Index (index constituents as of October of each corresponding year). Both Boards of Directors as well as Supervisory Boards are considered in this assessment.

Source: *Women on boards 2019 Progress Report* (see footnote #1)

MSCI further notes that the share of companies with all-male boards declined from over 22.5% in 2017 to 18.6% in 2019 for the MSCI ACWI Index. This decline was primarily driven by Japan, where the portion of companies with all-male boards dropped from 45% in 2018 to 33% in 2019. In addition, in Brazil, the share of firms with all-male boards declined from 47% in 2018 to 29% in 2019.

Women in the C-suite gaining share yet still lagging board representation

Female representation in the C-suite improved in 2019, albeit from what is still a low base. Women accounted for 4.3% of CEO seats for the MSCI ACWI, up from 3.7% in 2018, with representation improving across the main indices (Table 2).

¹ [Women on boards 2019 Progress Report](#), Olga Emelianova, Christina Milhomem, December 2019.

Table 2: Women in CEO seats by region

Percentage of women in CEO seats, 2017-2019; %

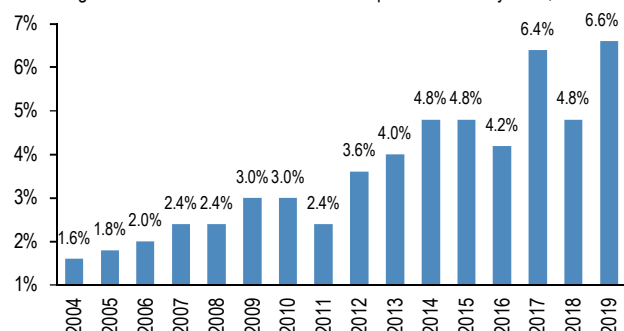
CEO seats	2017	2018	2019
MSCI ACWI	3.9%	3.7%	4.3%
MSCI World	4.2%	3.8%	4.6%
MSCI World (US)	5.1%	4.5%	4.9%
MSCI EM	3.3%	3.4%	3.8%
Countries with highest representation			
New Zealand			28.6%
Belgium			18.2%
Israel			16.7%
Greece			14.3%
Thailand			13.9%

Source: *Women on boards Progress Report 2019* (Appendix 2); see footnote #1

In the US, female CEO representation at Fortune 500 companies has come a long way over the past 15 years, but remains low (Figure 4).

Figure 4: Women CEOs in the Fortune 500 list

Percentage of women CEOs at Fortune 500 companies as of May 2019; %



Source: Catalyst, [Historical List of Women CEOs of the Fortune Lists: 1972-2019](#)

In 2019, 12.5% of all CFO seats were occupied by women, up from 11.1% in 2018, with the MSCI EM leading for the second year in a row at 14.4% (Table 3).

Table 3: Women in CFO seats by region

Percentage of women in CFO seats, 2017-2019; %

CFO seats	2017	2018	2019
MSCI ACWI	9.5%	11.1%	12.5%
MSCI World	9.4%	9.7%	11.2%
MSCI World (US)	12.6%	12.2%	12.7%
MSCI EM	9.8%	13.4%	14.4%
Countries with highest representation			
Isle of Man			50.0%
Thailand			38.9%
Denmark			31.3%
Singapore			30.8%
Malaysia			27.9%

Source: *Women on boards Progress Report 2019* (Appendix 2); see footnote #1

Government mandates to enhance gender diversity

Over the last decade or so governments across the world have begun to implement legislation mandating gender diversity on corporate boards (Table 4). Notable recent additions include, for example, the UK and Portugal.

Table 4: Mandated gender quotas by region

Mandated gender quotas or equivalent, by country or state

Market	Requirement type	Requirement	Year Introduced	Due Date
Belgium	Mandatory	33%	2011	2017
Denmark	Mandatory	Varied	2013	n/a
Finland	Comply or explain	At least one	2008	n/a
France	Mandatory	40%	2010	2016
Germany	Mandatory	30%	2015	2016
India	Mandatory	At least one	2013	2015
Israel	Mandatory	At least one	1999	n/a
Italy	Mandatory	33%	2011	2015
Japan	Voluntary	30%*	2014	n/a
Luxembourg	Comply or explain	40%	2014	2019
Malaysia	Comply or explain	30%	2017	n/a
Netherlands	Comply or explain	30%	2013	2016
Norway	Mandatory	40%	2003	2008
Pakistan	Mandatory for new directors	At least one	2017	n/a
Portugal	Mandatory for new directors	20%/33.3%	2018/2020	n/a
Singapore	Voluntary	20%	2017	2020
Sweden	Comply or explain	40%	2016	2020
Spain	Mandatory (no penalties)	40%	2007	2015
Turkey	Comply or explain	25%	2013	n/a
California	Mandatory	At least one	2018	2019
California	Mandatory	At least two or three**	2018	2021
UAE	Mandatory	At least one	2012	n/a
UK	Voluntary	33%	2019	2020

* Of leadership positions. ** Two for five-member boards, three for six-member boards.

Source: *Women on Boards Progress Report 2019*; see footnote #1.

Some countries and territories have requirements for state-owned companies only, including Austria (35%), Chile (40%), Colombia (30%), Greece (33%), Ireland (40%), Israel (50%), Quebec (50%), South Africa (30%), Switzerland (30%), and Taiwan (33%).

In addition to these, there are pending mandates in the EU (requiring 40%), Canada (40%), South Africa (50%), and Brazil (40% by 2022).

Thus far, countries that introduced a government mandate prior to 2019 on average show higher rates of

females in CEO/CFO seats, as well as a higher proportion of women on boards, compared to the MSCI indices (Table 5).

Table 5: Female representation in countries with government mandates, 2019

Female representation on boards in countries with mandated gender quotas or equivalent, by country or state

	# Cos	3+ WOB (2018)	3+ WOB (2019)	Female CEO	Female CFO
Norway	10	100.0%	100.0%	10.0%	20.0%
Italy	19	100.0%	100.0%	0.0%	15.8%
Belgium	11	80.0%	100.0%	18.2%	9.1%
Portugal	3	33.0%	100.0%	0.0%	0.0%
France	73	100.0%	98.6%	6.8%	14.9%
Sweden	28	97.0%	96.6%	6.9%	6.9%
Austria	5	60.0%	83.3%	0.0%	0.0%
UK	83	72.0%	82.2%	7.9%	16.8%
Germany	47	79.0%	81.0%	0.0%	13.8%
South Africa	35	61.0%	79.5%	0.0%	9.1%
Average*		78.2%	92.1%	5.0%	10.6%
MSCI ACWI	2,765	32.1%	36.2%	4.3%	12.5%
MSCI World	1,630	44.0%	51.1%	4.6%	11.2%
MSCI EM	1,135	12.8%	14.8%	3.8%	14.4%

* Weighted average (by number of companies) = 89.3% for 3+ WOB in 2019, 5.2% Female CEOs and 13.5% Female CFOs.

Source: *Women on Boards Progress Report 2019*; see footnote #1.

Although the US does not have a national mandate for women on corporate boards, California instituted a gender mandate in 2019, and other states have taken steps to increase transparency around gender balance and to promote the inclusion of women in leadership positions. Similar to California, Michigan and New Jersey have proposed legislation to mandate female participation on corporate boards for publicly-held corporations (foreign and domestic) with principal executive offices in those states, while Pennsylvania has proposed a resolution that urges (but does not require) publicly-held corporations in the state to increase female representation on their boards.

Instead of mandating gender diversity, some states have required greater transparency. Maryland passed legislation in 2019 that requires companies to include the number of women serving on the board of directors and

the total number of board members on their annual reports to the State Department of Assessments and Taxation. Similarly, Illinois passed legislation focused on annual reporting requirements to collect information about board member diversity—not just about gender, but also race/ethnicity.² Finally, New York recently passed legislation “requiring the New York State Department of State and the Department of Taxation and Finance to conduct a study on the number of women directors who serve on each board of directors of domestic and foreign corporations authorized to do business in New York.”³

Greater female board/leadership representation is only part of the puzzle

In our note from last year (see “Improved gender balance on corporate boards,” *J.P. Morgan Perspectives: Achieving Gender Balance 2019: Progress, Opportunities and Challenges*, Joyce Chang et al., 1 March 2019), we noted that the academic literature on the financial impact of gender diversity have shown mixed results. A recent Harvard Business School study found that the conflicting research may be due to differences in context. Specifically, in a study of 1,069 leading firms across 35 countries and 24 industries, researchers found that gender diversity relates to more productive companies, as measured by market value and revenue, *only* in contexts where gender diversity is viewed as “normatively” accepted (i.e., there is a widespread cultural belief that gender diversity is important). In other words, they found that “beliefs about gender diversity create a self-fulfilling cycle. Countries and industries that view gender diversity as important capture benefits from it. Those that don’t, don’t.”⁴

Thus, this research suggests that increasing the share of women on boards and in leadership positions is only part of the puzzle; for gender balance to truly be achieved, cultural beliefs must also be addressed.

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² See <http://www.ilga.gov/legislation/publicacts/101/PDF/101-0589.pdf>

³ See <https://www.governor.ny.gov/news/governor-cuomo-signs-legislation-enacting-women-corporate-boards-study>

⁴ “Research: When Gender Diversity Makes Firms More Productive,” Stephen Turban, Dan Wu, Letian (LT) Zhang, *Harvard Business Review*, February 11, 2019.

Gender pay equity: Mixed results

- **In the US, the unadjusted gender pay gap has been stagnant for much of the last decade, hovering near 18.5% as of 2019, while it declined to 15.7% in the EU in 2018.**
- **Early reporting on gender pay gaps by UK companies for 2019 suggests the pay gap hovers around 12-13%...**
- **...and that financial/insurance, construction, and education industries continue to report the largest pay gaps.**
- **We review the policies in place across regions on pay transparency.**

In this chapter, we provide an update on gender pay gaps across industries and countries using the latest available data and review the policies in place across regions on pay transparency. Globally, the unadjusted pay gap, or the relative difference between average or median hourly earnings for female and male employees as a fraction of male earnings, remains a key indicator for monitoring progress toward gender pay equity given the simplicity of the measure, though various factors likely contribute to differences in average or median pay. In the US, the unadjusted gender pay gap has been stagnant for much of the last decade, hovering near 18.5% as of 2019, while it declined to 15.7% in the EU in 2018 (based on preliminary estimates), and the early submissions in the latest round of annual reporting by companies in the UK suggest the pay gap hovers around 12-13%.

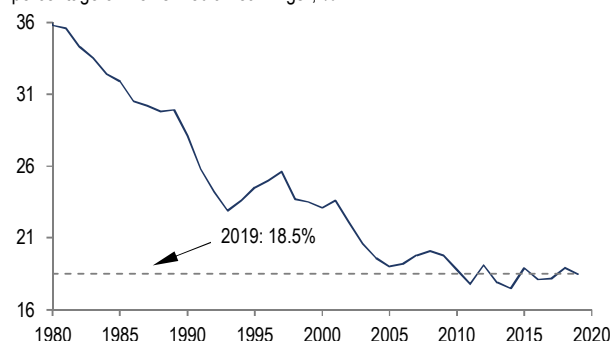
Figure 1 shows the US gender pay gap over the past four decades, based on annual data from the Current Population Survey (CPS). We find that the gap between female and male median earnings declined modestly from 18.9% in 2018 to 18.5% in 2019, but it remains little changed from the levels observed in recent years, after declining sharply into the early 2000s. While the persistent gap may reflect various factors, it is notable that women tend to exhibit higher levels of educational attainment. Interestingly, according to the [2018 annual CPS report](#),¹ the wage gap for workers over 25 years old who have at least a bachelor's degree is considerably

¹ [Highlights of women's earnings in 2018](#), Report 1083, BLS Reports, November 2019 (<https://www.bls.gov/opub/reports/womens-earnings/2018/pdf/home.pdf>)

higher than the population average at 24.9%, which has been stagnant for nearly two decades and above the minimum of 23.2% reached in 1994.

Figure 1: US gender pay gap

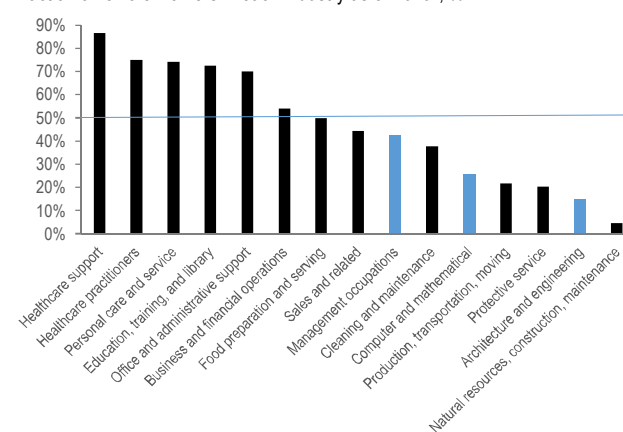
The difference between men's median weekly earnings and women's as a percentage of men's median earnings*; %



* Includes all full-time wage and salary workers
 Source: Bureau of Labor Statistics, Current Population Survey

Figure 2: Fraction of positions in various industries held by women

Fraction of female workers in each industry as of 2019*; %



* Includes all full-time wage and salary workers
 Source: Bureau of Labor Statistics, Current Population Survey

A portion of the overall gap likely reflects an underrepresentation of women in the highest-paying fields, which could reflect self-selection into lower-paying sectors. The CPS data revealed that women continue to represent the minority in the industries with the highest median earnings, such as management occupations, computer/mathematical occupations, and architecture and engineering, while they represent the

majority in many service industries (Figure 2). However, we do also observe a persistent wage gap within each industry. The gap is largest in the legal field, where the gap between median weekly earnings for men and women was 37% in 2019.

On the policy front, there are no national laws requiring companies to report gender pay gaps in the US. A federal judge ordered the Equal Employment Opportunity Commission (EEOC) last April to implement without further delay its proposal to collect annual pay data (including a breakout by gender and ethnicity) from employers with 100 or more employees. However, by September, the EEOC announced that it would discontinue this aspect of its data collection. Away from federal laws, many states have enacted their own pay equity laws, including salary history bans, aimed at preventing employers from requesting salary history information from job applicants, as it is believed that the question could perpetuate wage discrimination. Other state laws prohibit employers from enforcing pay secrecy among colleagues.²

While pay gap reporting has been slow to take off in the US, pay transparency is increasing through the sharing of salary information over the internet, on platforms such as PayScale, a survey-based compensation software company. Moreover, [results from their survey data](#)³ suggest that 1) women tend to have a more negative perspective on pay fairness compared to white men, and 2) when companies are open and honest about the salaries they give all employees, the wage gap in most industries and at all job levels is reduced significantly. [Recent research](#)⁴ from Harvard Business School shows similar findings.

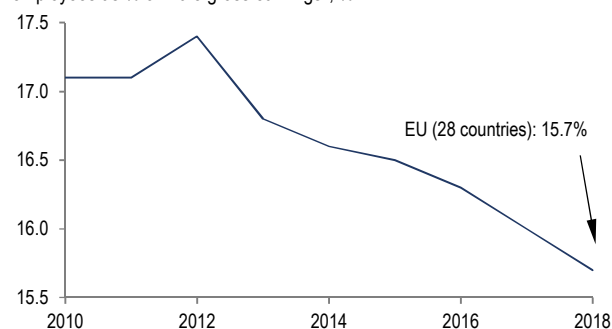
In Europe, preliminary reporting shows that the average unadjusted gender pay gap declined across the 28 EU member states in 2018 to 15.7% (Figure 3). Eurostat published a [methodological study](#)⁵ decomposing the unadjusted gender pay gap into “explained” and “unexplained” components, where the explained component is the gap in earnings due to differences in the average characteristics of male and female employees in the labor market (including age, education,

occupation, work experience, etc.), while the unexplained component is the residual gap not explained by those differences. The study finds that nearly a third of the unadjusted wage gap can be explained by differences in the characteristics of men and women in the labor force—with sectoral segregation playing the largest role, leaving an unexplained pay gap of 11.5%. Despite women achieving, on average, more education than men in most European labor markets, men also work in better paid economic sectors than women on average, in almost every country. In some countries such as Germany and France, working time (i.e., full time or part time) also explains a significant portion of the gender pay gaps, with women tending to work part time more often than men.

In terms of policy action, France passed legislation in September 2018 that requires employers with at least 50 employees to publish information each year on gender pay gaps and the actions they have taken to address them. In Germany, the German Wage Transparency Act took effect in January 2018, applying to companies with at least 200 employees, and providing individuals with the right to obtain information on pay levels of their co-workers of the same level and opposite gender. In Austria, employers with more than 150 employees must submit confidential equal pay reports every two years containing information about the median income of women and men at each pay level.

Figure 3: EU-wide unadjusted gender pay gap

Difference between average gross hourly earnings of male and female employees as % of male gross earnings*: %



* 2018 figure based on preliminary results for many countries.

Source: Eurostat

² [Fact Sheet: Guidance on Pay Equity for Employers in New York State](#), New York Department of Labor

³ [Does Pay Transparency Close the Gender Wage Gap?](#), Payscale

⁴ *The Salary Taboo: Privacy Norms and the Diffusion of Information*, Z. Cullen, R. Perez-Truglia, January 2020.

⁵ *A decomposition of the unadjusted gender pay gap using Structure of Earnings Survey data*, D. Leythienne, P. Ronkowski, 2018 edition.

The UK passed pay transparency regulations in 2017, requiring organizations with at least 250 employees to disclose pay gap data annually. We now have two full years of reported data, as well as initial results for the 2019-2020 reporting year (representing about 10% of firms), summarized in Table 1. The data continue to show that for every industry in the UK, average hourly pay is higher for men than for women. For most industries, women on average represent the minority of employees in the top pay quartile and the majority in the bottom pay quartile. Between the first two reporting years, the average pay gap across industries, based on both average and median hourly pay, was virtually unchanged at 14.2% and 11.9%, respectively. Based on the results received thus far for 2019, the average pay gap (based on average

hourly pay) has declined to 13.1%. The financial/ insurance industry continues to report the widest pay gap based on mean hourly pay, at 26.7%, a slight increase from last year's results. Meanwhile, the education sector still reports the widest gap based on median hourly pay, at 25.4%, despite also reporting a 64% fraction of women in the top pay quartile.

The UK Government Equalities Office recommends four evidence-based actions for employers to reduce the gender pay gap and improve gender equality in organizations: 1) include multiple women in shortlists for recruitment and promotions, 2) use skill-based assessment tasks in recruitment, 3) use structured interviews for recruitment and promotions, and 4) encourage salary negotiations by showing salary ranges.

Table 1: Results from UK gender pay gap reporting for 2017-2018 and 2018-2019 reporting years

	2017-2018 Reporting year			2018-2019 Reporting year			2019-2020 Reporting year		
	Pay gap measured as:		Female Top Quartile %	Pay gap measured as:		Female Top Quartile %	Pay gap measured as:		Female Top Quartile %
	Diff. mean hourly rate	Diff. median hourly rate		Diff. mean hourly rate	Diff. median hourly rate		Diff. mean hourly rate	Diff. median hourly rate	
Financial and insurance activities	25.7	21.8	29	26.1	21.9	30	26.7	22.4	33
Construction	22.4	23.7	10	22.2	23.1	10	22.6	22.0	10
Information and communication	19.5	17.8	23	19.5	17.7	23	18.1	15.9	27
Professional, scientific and technical activities	19.1	15.7	31	19.5	16.6	32	17.4	15.5	33
Real estate activities	17.2	13.0	36	17.2	12.6	35	7.1	4.8	35
Education	16.2	21.9	60	16.3	22.3	61	16.9	25.4	64
Electricity, gas, steam and air conditioning	15.0	14.8	18	14.0	13.4	18	17.1	20.0	15
Wholesale and retail trade	14.8	7.9	36	14.7	8.0	36	15.7	9.7	25
Manufacturing	13.0	10.0	19	12.5	9.9	19	12.0	8.4	19
Other service activities	12.6	10.2	43	12.5	9.5	44	12.8	7.6	53
Activities of households as employers	12.5	7.0	45	7.6	4.3	47	9.0	8.8	36
Administrative and support service activities	12.0	9.9	37	11.0	9.1	37	10.4	9.6	37
Transportation and storage	10.4	9.8	15	10.8	9.7	16	8.6	5.7	18
Activities of extraterritorial organizations	9.8	5.5	42	12.3	11.0	45	-	-	-
Human health and social work activities	9.5	3.9	73	10.6	5.0	72	6.2	1.9	74
Public administration and defense	8.3	7.7	47	8.0	7.3	47	6.6	5.9	50
Accommodation and food service activities	8.0	3.6	44	7.0	3.2	44	7.9	3.9	47
Arts, entertainment and recreation	20.1	6.4	37	20.0	6.3	38	10.1	4.8	47
Water supply, sewerage, waste management	4.4	6.1	21	4.0	6.2	20	11.4	12.2	24
Industry not reported	14.7	13.7	47	15.2	14.9	47	13.4	14.2	51
Grand total	14.3	11.8	39.2	14.2	11.9	39.7	13.1	12.0	43.1

Source: UK Gender pay gap service

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Mother Nature: The gender-climate nexus

- **Climate change is a global issue but is experienced differently across geographies and genders.**
- **Reduced resilience and adaptive capacity creates vulnerabilities for women, largely in developing countries.**
- **Women overwhelmingly show higher concern over climate change but hold less political influence.**
- **Gender-responsive climate policy can help narrow gender gaps in the face of climate change.**

To assess who is most vulnerable to climate change, one has to consider that climate change exacerbates existing vulnerabilities. For this reason, low-income emerging market economies are considered most at risk from a changing climate. They often already experience high temperatures, rely heavily on agricultural sectors, and possess fewer resources to invest in adaptation and mitigation. Climate change—that is, temperature rise, but also increased frequency and intensity of extreme weather events (floods, storms, droughts)—will aggravate such vulnerabilities. It follows then, that gender disparities (economic and social) will also be worsened under climate change. Drawing on the wealth of research published by the United Nations Development Programme, this note explores climate change from a gendered perspective.

Those most vulnerable in society, from an economic and social standpoint, are deemed the most vulnerable to climate change. Indeed, that includes women, but there is an intersection between children, the elderly, indigenous people, and those with disabilities. While much research focuses on women in low-income developing regions, it is worth noting that women in high-income regions are also at a climate disadvantage (for example, we will discuss disaster-related violence against women) and are also less represented in political

circles, despite typically showing more concern for climate change and the impact on future generations.

Women face elevated risks from natural disasters—the frequency and intensity of which will be greater under climate change—as well as in their unique exposure to natural resources. Women are also less able to influence the adaptation and mitigation of climate change because of a generally weaker economic standing (poorer, limited access to credit) amid less representation in the political sphere. It is such pervasive inequalities, rather than biological sex, that are found to disadvantage women in the face of climate change.

Natural disasters are found to inflict higher fatality rates on women compared to men, usually due to inadequate access to information or early warnings, as well as limited access to resources that can build resilience.¹ The disparity is especially stark in developing countries. There are a number of reasons for this; most revolve around societal, cultural and religious norms. Since women typically bear the burden of child and elderly care, they are more likely to be at home taking care of others when disasters hit, thus escaping is made more challenging. To illustrate, during Hurricane Harvey in 2017, many women chose not to evacuate, as caring burdens complicate the decision to leave.² This is complicated further in communities where women require permission of a male relative to travel, or even leave the house. Victims of a 1991 cyclone in Bangladesh were 90% women, in part, because warning messages were delivered to men in public spaces but did not reach the women waiting in their homes.³

Due to societal norms, women are also less likely to acquire life-saving skills, including swimming and tree climbing, which can prove vital during a flood or tsunami. Indeed, women accounted for 70-80% of deaths in the 2004 Indian Ocean tsunami.⁴ Gender-based violence is a separate concern for women, as the economic hardship left behind in the wake of disasters can give rise to gender-based violence. Research finds that disasters leave women and girls more vulnerable to domestic violence, sexual exploitation, trafficking, and

¹ United Nations Development Programme (2013), “Gender and disaster risk reduction”

² World Bank (2018), “Why we must engage women and children in disaster risk management”

³ Ikeda (1995), “Gender Differences in Human Loss and Vulnerability in Natural Disasters: A Case Study from Bangladesh”

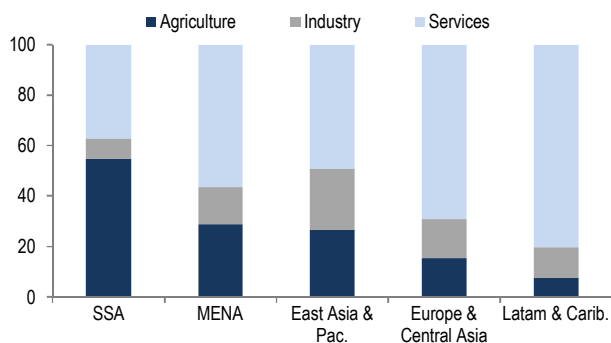
⁴ United Nations Development Programme (2013), “Gender and adaptation – Policy Brief 2”

child marriage.⁵ For example, women in the US, displaced to trailer parks in the wake of Hurricane Katrina, experienced a rape rate 54 times higher than the baseline Mississippi level.⁶

Countries that rely heavily on agriculture are vulnerable to climate change, as a warmer climate, altered weather patterns, droughts, floods and soil degradation weigh on natural resources and agricultural production. This is expected to exacerbate poverty and malnutrition in less-developed countries and poses a unique burden for women. While women’s participation in the agricultural sector is significant, especially in Sub-Saharan Africa (Figure 1), female land ownership is considerably smaller. In developing countries, women in agriculture generally have less access to productive resources, including land, technology and finance. This hampers their ability to adapt to climate change and thus renders women more vulnerable to food insecurity.⁷ Cultural norms may also prevent women from finding employment outside of agriculture (for example, in urban centers) in the way that men might in the event of an agricultural shock. Lastly, as women and girls in rural communities often bear the burden of resource collection, food and water scarcity will force them to spend more time on resource collection with less time available for paid work or attending school.

Figure 1: Share of female employment by sector

Developing countries in each region, %



Source: World Bank, J.P. Morgan

While awareness and concern over climate change is rising globally, research finds that women

⁵ International Federation of Red Cross and Red Crescent Societies (2015), “Unseen, unheard: Gender-based violence in disasters”

⁶ Overseas Development Institute (2016), “Disasters and violence against women and girls”

overwhelmingly possess a greater degree of concern than men (Table 1). This nuance is significant for environmental policy making: studies show that countries with higher female parliamentary representation are more likely to ratify international environmental treaties and set aside protected land areas.⁸ Studies also find positive correlation between the share of women on corporate boards, and the quality of carbon emissions disclosures.⁹

Table 1: Women are more concerned about climate change

Responses to survey question: “Do you think that global climate change is a major threat to our country?”

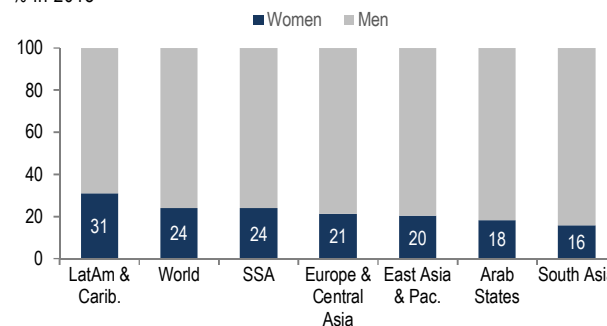
	Men	Women	Diff (%-pts)
US	51	66	+15
Canada	59	72	+13
Poland	48	61	+13
Spain	75	87	+12
Sweden	64	75	+11
Russia	37	47	+10
UK	61	71	+10
Netherlands	67	73	+6
Germany	69	73	+4
Greece	88	92	+4
France	82	83	+1
Italy	72	71	-1
Hungary	71	62	-9

Source: Pew Research Center, 2018 Global Attitudes Survey

But women are still overwhelmingly underrepresented in the political sphere, meaning they have limited opportunity to influence policy change (Figure 2).

Figure 2: Gender representation in parliament

% in 2018



Source: UNDP, J.P. Morgan

⁷ United Nations Development Programme (2016), “Gender, climate change and food security”

⁸ UNDP (2011), Human Development Report. Sustainability and Equity: A Better Future for All

⁹ Liao et al (2015), “Gender diversity, board independence, environmental committee and greenhouse gas disclosure”

A gendered perspective on climate change is critical to environmental policy making, in order to prevent widening existing gender gaps. As well as the effects of climate change itself, ignoring the distributional impact of climate policy may undermine gains made toward gender and social equality. For instance, a global tax on carbon—assumed necessary if we are to meet the Paris objective of limiting the temperature rise to below 2⁰C—will likely push up fuel costs for consumers. Due to a higher proportion of women in the poorest communities, a carbon tax risks subjecting more women (especially the elderly or single mothers) to poverty. Moreover, the ILO warns that without overcoming gender disparities in the industrial sector, the transition to a low-carbon economy (and the associated rise in renewable energy, manufacturing, construction) would see the share of female employment lower than it would otherwise be.¹⁰ This highlights the importance of incorporating gender into green economy planning.

Women face a unique burden but also have a role to play in the fight against climate change—in adaptation and mitigation. At a micro level there are calls to engage with women in rural communities to leverage their local knowledge and better understand adaptation possibilities. Policy should also better tap into the unique role of women in disaster management and community resilience. At a macro level, especially in countries where female labor force participation is low, climate change represents an opportunity for women to enter non-traditional sectors, such as those relating to green energy transition. Financing for “climate-smart” agriculture also poses an opportunity, not just to strengthen the resilience of agriculture, but also to reduce the sector’s own contribution to global warming (agriculture generates some 24% of total greenhouse gas emissions) and to address gender imbalances.

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¹⁰ ILO (2018) submission to the UNFCCC regarding Gender and Climate Change

Overview of the global ESG Market: Global in scope and moving beyond active management

- **A growing share of investment processes, products, and active ownership practices are integrating ESG principles. Using the broadest classification for the ESG market, including those following ESG principles, assets following global sustainable investment approaches could reach ~\$45trn AUM by the end of the year.**
- **ESG investing is now firmly expanding in the US and Asia and moving beyond active equity management.**

The recent momentum observed on ESG investing is remarkable. Once a niche, ESG investing is fast growing in every geography, and assets indicated as following ESG principles may soon represent 44% of global AUM. Moreover, the market is now global: while Europe can be seen as a maturing market, initiatives and flows are burgeoning in other geographies. Institutional investors' commitments to integrate ESG into their investment processes are multiplying, and passive investors are increasingly part of this trend.

A large market with blurry borders

While it is relatively easy to relate to what Environmental, Social and Governance factors are, it is harder to define the ESG market itself. The coexistence of multiple denominations (i.e., ESG, Responsible Investment, Sustainable Finance...) with multiple definitions and concepts makes precise estimation challenging.

In order to build our estimates, we extrapolated the trends seen in the market-reference 2018 Global Sustainable Investment Alliance (GSIA) data, which consolidates data reported by seven membership-based sustainable investment organizations around the world.

Based on this data, we estimate the global “broadly defined” ESG market, which includes assets indicated as following ESG principles, to be around **\$45trn of assets under management in 2020**. This estimate is consistent with the United Nations Principles for Responsible Investment's minimum requirement for its 2,500 signatories with \$90trn AUM to have a responsible

investment policy covering >50% of AUM by the end of 2020. These figures are based on a broadest definition of ESG-investing and illustrate the growing prevalence of the field. The size of ESG-dedicated funds is considerably smaller at around \$1trn, or around a 2% share of the market.

Figure 1: There are widely different estimates of the ESG market size (\$trn)



Source: GSIA, PRI, Deloitte, J.P. Morgan

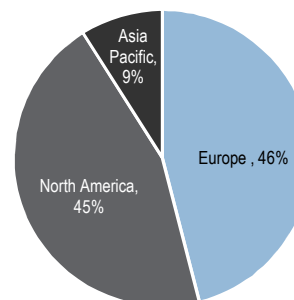
Europe and USA are dominating, but Asia is joining the movement

In terms of geographies, **Europe** and **North America** accounted for more than 90% of the market in 2018. While “tipping-point” has been used to characterize this market for almost as long as it has existed, we do believe a substantial shift is underway.

Europe was historically the uncontested leader in sustainable finance, but its dominant position is now challenged by other regions—with America at the forefront—which are answering the call of sustainability.

Figure 2: ESG is no longer limited to the European market

% of 2018 global AUM



Source: GSIA, J.P. Morgan

While Asia has long been a laggard in ESG investing, the movement is now spreading there too, and ESG disclosures regulations are being adopted or discussed in multiple jurisdictions. Japan has been among the first to adopt the trend, and one of the most symbolic changes

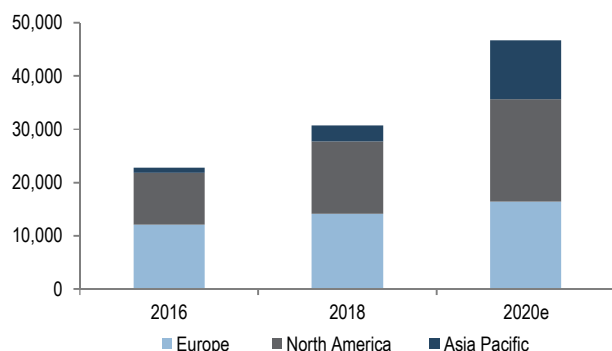
has been the Japanese Government Pension Investment Fund signing the Principles for Responsible Investment in 2015.

Entering the maturation phase at 44% of global AUM

With the broadly defined ESG market already accounting for a striking **44%** of global AUM, it is possible that the strong growth phase seen over the last few years may reach a plateau as the penetration of ESG reaches levels similar to Europe in other regions, and more clarity emerges on the boundaries of the market.

Figure 3: Historically a European focus, ESG is spreading to other geographies

AUM by region; \$ billion

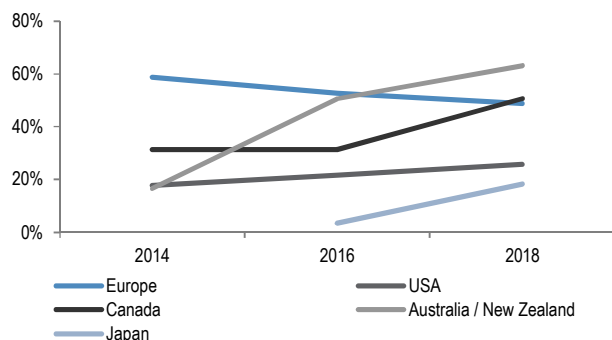


Source: GSIA, J.P. Morgan

As shown below, Europe is the only region where ESG penetration has decreased as a proportion of total assets. We believe that such a counterintuitive trend could continue as more clarity emerges on what is defined as ESG “compliant.” Yet, we believe that the broadest definition for ESG used in GSIA leaves large upside in all geographies.

Figure 4: Penetration of ESG assets to total AUM per region

% of ESG on total AUM per geography



Source: GSIA, J.P. Morgan

Equity dominates, but bonds are growing fast

In terms of asset classes, equity dominates and represents around half of total AUMs, but green bonds are sprouting, and sustainability is quickly spreading to other asset classes.

Table 1: Split of ESG in Asset Classes

%	RE	RE	RE	O	O	O	O	O	O
3% Real Estate	FI	FI	FI	FI	FI	FI	FI	PE	PE
36% Fixed Income	FI	FI	FI	FI	FI	FI	FI	FI	FI
51% Listed Equity	E	FI	FI	FI	FI	FI	FI	FI	FI
	E	E	E	E	E	E	E	E	E
	E	E	E	E	E	E	E	E	E
	E	E	E	E	E	E	E	E	E
	E	E	E	E	E	E	E	E	E
	E	E	E	E	E	E	E	E	E

Source: GSIA, JPMorgan

A universe of ~2500 ESG-related funds

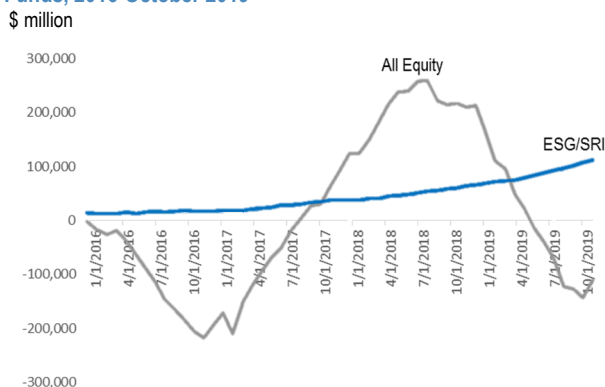
There is no standardized definition nor global register for funds integrating ESG into their investment processes. According to Morningstar, at the end of June 2019, there were 2,232 open-end and exchange-traded funds domiciled in Europe that, by prospectus, either stated that they use specific ESG criteria as a key part of their security-selection process or indicated that they pursue a sustainability-related theme or seek a measurable positive impact alongside financial return. According to the same source, the US had 351 such funds at the end of 2018.

Yet, we believe that the trend towards firm-wide commitments to integrating ESG may not be reflected in the description or mandate of funds. Focusing purely on these funds would therefore significantly underestimate the AUM somehow linked to ESG strategies. J.P Morgan’s EMEA General Financials Research team employs an alternative measurement methodology utilizing Morningstar funds defined as “sustainable” and estimates assets following ESG strategies at around \$5trn.

Impressive flows since 2016

Looking specifically at equity, the current trend is impressive, as inflows to ESG products have been growing steadily since 2016, offering a stark contrast with the overall outflows in the industry. The inflows in ESG products are increasing with the launch of new funds as well as the repurposing of non-ESG funds.

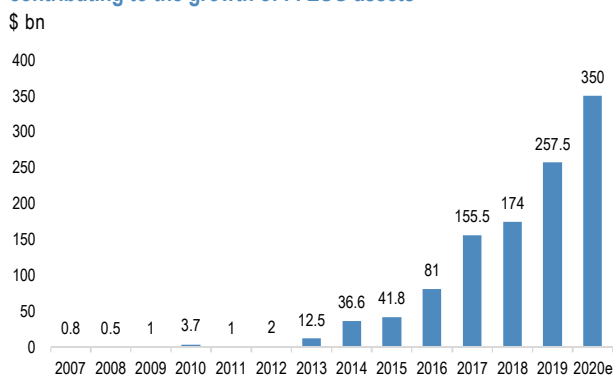
Figure 5: Cumulative monthly flows for all and SRI/ESG Equity Funds, 2016-October 2019



Source: EPFR, J.P. Morgan

For the fixed-income ESG market, Green bonds are by far the fastest-growing market, with expectations for \$350bn of issuance in 2020, a 36% growth compared to 2019.

Figure 6: The rapid growth of the Green bond market is contributing to the growth of FI ESG assets



Source: Climate Bonds Initiative, J.P. Morgan

Active versus Passive: momentum for both but passive share to increase

ESG is agnostic between active and passive investment strategies, but active management still dominates the ESG market in terms of AUM. With strong commitments towards increasing ESG integration coming from large

asset managers on both the active and passive side, the future split for ESG AUM will probably follow the overall trend in asset management.

Active: Europe’s largest asset manager, Amundi, plans to integrate environmental, social and governance (ESG) investment criteria into all actively managed funds by 2021. As part of the plan, all investment staff are trained in ESG, and companies the firm invests in are to be weighted partly by their ESG rating. Several other large European asset managers have taken firm-wide 100% ESG commitments, including Schrodgers and BNP Paribas AM. We therefore believe that the gap between different estimates of the market size will be reduced with estimates going towards the higher end.

Passive: We believe that recent announcements by BlackRock will drive an increasing share of passive flows into ESG investing. At the beginning of the year, BlackRock—the world’s largest asset manager and a leader in passive investment—announced that it would double its ETFs and index funds offering to 150, including “sustainable” alternatives to its largest funds.

A market dominated by institutional investors, with a growing retail component

GSIA estimates that institutional clients account for 75% of the ESG investment market, with the remaining 25% of assets from retail clients. While we expect institutional investors to continue to represent the majority of the market given their higher level of sophistication and public relations encouraging ESG investing, retail adoption of ESG strategies increased from 11% to 25% of assets within ESG strategies between 2012 and 2018. Retail adoption of ESG strategies has slowed in 2020, however, following a strong 2019 (see [Panigirtzoglou, et al.](#)).

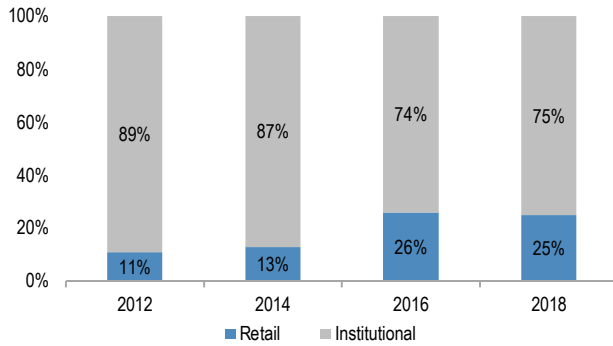
As retail investors increase their ESG investments the reputational risk as well as the regulatory risk related to products marketed as sustainable could increase, with market watchdogs including the ESMA starting to monitor ESG issues. The varying degrees of financial sophistication and the potential for different interpretations of sustainability by retail versus institutional investors will need to be monitored as the retail market evolves.

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Global Equity Research
J.P. Morgan Perspectives
18 May 2020

Figure 7: Global ESG assets – Institutional vs Retail investors (2014-2018)



Source: GSIA, J.P. Morgan EMEA European General Financials Research Team

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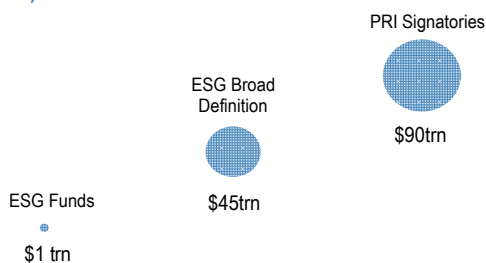
Current approaches to ESG strategies: ESG integration and negative screening dominate

- **ESG strategies are non-exclusive, and “responsible investment” requires a combination of ESG integration and Active Ownership.**
- **ESG integration approaches are preferred by US fund managers, whereas negative screening has the largest following in Europe.**
- **ESG integration is the fastest-growing large-scale strategy, but a growing shift from “responsible” to “sustainable” investment characterizes the longer-term trends.**

A \$45trn market with seven ESG strategies

According to our estimates based on data from the Global Sustainable Investment Alliance and PRI, the “broadly defined” ESG market represents approximately \$45trn of AUM in 2020. This represents approximately 50% of the AUM from investors who signed up for the PRI principles, and includes AUM reported by investors to the Global Sustainable Investment Alliance that is managed under seven ESG strategies, namely: Negative / Exclusionary Screening, ESG integration, Corporate Engagement and Shareholder Action, Norms-based screening, Positive / Best-in-class screening, Sustainability-themed investing, Impact / community investing.

Figure 1: There are widely different estimates of the ESG market size (\$trn)



Source: GSIA, PRI, Deloitte, J.P. Morgan

ESG strategies are combined in practice

While they are useful conceptually, one should keep in mind that the strategies are non-exclusive, i.e., a single fund can combine two or more of them following its investment objective. Notably, negative/exclusionary screening and corporate engagement / shareholder action

are usually combined with other strategies, such as ESG Integration.

Each of these strategies may have different objectives and datasets, which may blend sustainability-related objectives with financial performance related objectives. ESG integration, defined as the explicit and systematic inclusion of ESG issues in investment analysis and investment decisions, does not necessarily reflect an objective of seeing the E, S, G performance of companies improve, or that an investor wants to play a role in this improvement. However, in the case of Impact Investment, this objective is clearly stated, alongside financial performance objectives.

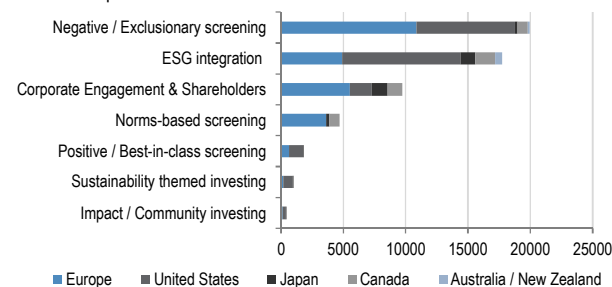
Exclusions and ESG integration are dominant

At present, Negative / Exclusionary screening is the dominant strategy in terms of total AUM, closely followed by ESG integration, Corporate Engagement / Shareholder Action, and Norms-based screening. These four strategies represent what we call “large-scale ESG strategies.” Depending on how they are implemented, these strategies can be relatively resource efficient.

“Core” ESG strategies are smaller in terms of AUM, and typically require more internal and external resources to implement. These strategies include: Positive / Best-in-class screening, where stocks are picked based on their ESG credentials, Sustainability Themed investing, where stocks are selected based on their exposure to a sustainability-related themes (e.g., Climate, Water, Gender diversity) and Impact strategies.

Figure 2: Negative screening dominates in Europe, while ESG integration is leading in the US

AUM, in \$bn as of 2018. Based on recalculation from numbers taken in the GSIA last report



Source: J.P. Morgan based on GSIA

We note that among large-scale ESG strategies, Negative / Exclusionary screening is the dominant strategy in Europe (\$10.8trn), versus \$7.9trn in the US. In the US, ESG integration is by far the most followed strategy (at

\$9.5trn versus \$4.9trn in Europe). The different positioning of the US market on ESG issues versus Europe suggests that the US market tends to integrate E, S, G factors based on their current financial materiality, making it more sensitive to the evolution of consumer trends and regulations. In contrast, Europe seems to use “exclusions” as a simple way to price-in negative sustainability impacts.

Momentum differs among ESG strategies

It’s also interesting to note that momentum can be very different for the various strategies. Among large-scale strategies, ESG integration is the fastest growing (+69%), at almost twice the growth of negative / exclusionary screening. We also note that norms-based screening is showing a negative trend (-24%), potentially reflecting the intent from market players to diverge from “box-ticking” approaches. Norms-based screening requires monitoring international norms violations, which can only be done through controversy monitoring, which is vulnerable to quality and subjectivity issues, with biases likely to arise from available data sources.

Table 1: Momentum differs depending on the strategy

Strategy	Growth 2016-2018
Negative/exclusionary screening	31%
ESG integration	69%
Corporate engagement and shareholder action	17%
Norms-based screening	-24%
Best-in-class/positive screening	125%
Sustainability themed investing	269%
Impact investing	79%

Source: J.P. Morgan based on GSIA

Among “core” ESG strategies, we note the strong growth of all approaches, and more specifically “Sustainability themed investing.” This reflects the rise of “environmental” themed funds over the period of 2016-2018, as regulations pushed for the integration of climate-related risks by financial actors.

Three ESG strategies driving growth

We think that investors should focus on three ESG Strategies: negative / exclusionary screening, ESG integration and impact investing.

- **Negative/exclusionary screening is historically the largest and simplest type of strategy.** It represents the core of ESG-investing notably linked to investments affiliated with religious institutions, which were among the first to request investments

suitable to their non-financial preferences (e.g., exclusions of investments related to weapons or contraception). Since then, negative screening has greatly extended its scope to cover sectors such as tobacco and fossil fuels, where the perceived negative sustainability impacts of the core businesses are deemed greater than the positive ones. In our view, exclusions are here to stay, even if we see them as increasingly complementary to forward-looking engagement approaches focused on transitioning business models.

- **ESG integration is the second-largest strategy and still growing significantly.** We believe ESG integration is on its way to becoming the dominant strategy in ESG as well as a market standard in the financial industry. The integration of financially material environmental, social and governance factors into the investment process is favored by most investors as it does not place a restriction on the investment universe, and as they focus on financial materiality, these strategies are correlated to alpha generation as well. However, as outlined below, the “sustainability” / “responsibility” aspect of these strategies will be increasingly questioned unless they are combined with explicit and ambitious active ownership strategies that embed a long-term stakeholder-value creation approach.
- **Impact investing is the smallest and newest strategy.** According to the [Global Impact Investing Network](#), Impact investments are made with the intention to generate a positive, measurable social and environmental impact alongside a financial return. It assigns a higher weight to sustainability compared to other strategies and values social and environmental impact at the same level as financial returns. In this way, it represents a middle step between investment, which focuses solely on returns, and philanthropy, which focuses solely on social and environmental impact.

We believe Impact Investing is the strategy most in line with the Framework of the United Nations 2030 Sustainable Development Goals. Moreover, with a natural focus on “sustainability,” it will be strengthened by several aspects of the European Sustainable Finance Action plan.

As such it will likely occupy a growing share of investors’ attention through the next decade. Progressively, we think that “best-in-class” and “sustainability-themed” strategies will strive to measure their impact, and demonstrate that “positive” impact has

been created, hence blurring the lines between “core” ESG strategies.

Responsible investment includes two pillars: ESG integration and active ownership

We found this debate to be already reflected in the PRI’s definition of responsible investment: “*a strategy and practice to incorporate environmental, social and governance (ESG) factors in investment decisions and active ownership.*” Thus, responsible investment includes two pillars: ESG integration and Active ownership.

Figure 3: Responsible investment includes two pillars: ESG integration and Active ownership

CONSIDERING ESG ISSUES WHEN BUILDING A PORTFOLIO (known as: ESG incorporation)		
ESG issues can be incorporated into existing investment practices using a combination of three approaches: integration, screening and thematic.		
Integration	Screening	Thematic
Explicitly and systematically including ESG issues in investment analysis and decisions, to better manage risks and improve returns.	Applying filters to lists of potential investments to rule companies in or out of contention for investment, based on an investor’s preferences, values and ethics.	Seeking to combine attractive risk-return profiles with an intention to contribute to a specific environmental or social outcome. Includes impact investing.
IMPROVING INVESTEE’S ESG PERFORMANCE (known as: active ownership or stewardship)		
Investors can encourage the companies they are already invested in to improve their ESG risk management or develop more sustainable business practices.		
Engagement	Proxy voting	
Discussing ESG issues with companies to improve their handling, including disclosure, of such issues. Can be done individually, or in collaboration with other investors.	Formally expressing approval or disapproval through voting on resolutions and proposing shareholder resolutions on specific ESG issues.	

Source: PRI

In practice, we think that tensions could arise between “ESG integration” and “Active ownership,” particularly if there is a lack of coordination, either because they are not moving at the same pace and / or in the same direction. These tensions may be reinforced for large asset managers, where stewardship teams are separate and independent from portfolio management teams.

Active ownership policies and actions, such as the support for specific shareholder proposals, are likely to become increasingly scrutinized by civil society, who are searching for consistency between claims and actions. The criticism that Vanguard and BlackRock received at the end of 2019 during the review of the proxy season highlighted that only a small number of climate-related resolutions had been supported by them.

Active Ownership 2.0: moving from responsible to sustainable investment

Active ownership policies and actions represent a necessary complement to integrating ESG factors into the investment process to achieve the PRI definition of Responsible Investment, as formalized proxy-voting policies and engagement with companies may be considered insufficient.

A [position paper](#) from the PRI makes the case for improving investors’ stewardship, under the umbrella of “Active Ownership 2.0.” In short, this paper highlights the need to move from a world of “form,” where engagement and stewardship processes are now in place, to a world of “substance” where the engagement process will address long-term, systemic risks. This will be achieved, in their view, by addressing the structural myopia of short-termism, by focusing on outcomes (i.e., real-world goals) versus inputs / processes, and developing stewardship processes that focus less on the risk and returns of individual holdings, but more on long-term, absolute return for universal owners, including real-term financial and welfare outcomes for beneficiaries. In a nutshell, active ownership 2.0 is about switching the “operating system” of investment from a shareholder to a stakeholder value perspective.

Such a paradigmatic shift could be summarized as the transition from “responsible” to “sustainable investment,” where investment decisions are made under a long term, multi-stakeholder value creation approach, considering both environmental and social outcomes of investments, with the aim to ensure long-term stability and avoid the materialization of systemic risks. As ESG preferences are redefined under this approach, capital would be reallocated accordingly.

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ESGQ and the COVID-19 induced crash

- **We use J.P. Morgan's ESGQ stock selection framework and ESG dimensions to illustrate that ESG-related strategies outperformed during the COVID-19 induced crash, strengthening the rationale for investing in ESG strategies.**
- **During the US equity sell-off, ESG strategies showed broadly flat performance for excess long screens and had significant gains on a long versus short basis (approximately +10%).**
- **Governance and Social factors have appreciated more than the Environmental long/short.**

We use J.P. Morgan's ESGQ stock selection framework and ESG dimensions to illustrate that ESG-related strategies outperformed during the COVID-19 induced crash, strengthening the rationale for investing in ESG strategies. Before the COVID-19 crisis, as volatility had dropped to record low levels, there was growing concern of its high correlation and concentration to Momentum and Quality strategies (see *European Quant Strategy: Style Investing: Is Value the only hedge?*, K. Chaudhry, 14 Feb. 2020). With the recent surge in volatility, COVID-19 has taken the world by surprise and acted as a catalyst to expose many of the extremes not only within the global economy and financial markets, but also within society at large.

ESG Performance and Valuations

ESG strategies fell with the market in absolute terms during the US equity sell-off; however, they showed broadly flat performance for excess long screens, and had significant gains on a long versus short basis (approximately +10%). While equity markets fell sharply during February and March, our back-testing of ESG datasets suggests highly rated ESG stocks generally had low stock price volatility and suffered lower draw-downs (peak-to-trough falls) throughout this period of market stress.

Attractive ESG strategies have typically traded at a valuation premium to screens with poor ESG ratings. At the beginning of 2020, ESGQ longs traded at a 42% premium to ESGQ shorts, and on 19th February (pre-crash) that premium appreciated to 54%. Despite a large and significant P/E contraction to both long and short screens the P/E premium widened further to 77% in

March. Today, the valuation premium has derated and is now lower than in Q1, but remains elevated at 42%. On average ESGQ longs saw their prospective P/Es fall by 18%, and stock prices fell by 26% during Q1 (peak to trough). ESGQ (long) is continuing to show smaller price falls and lower draw-downs, but this continues to come with a lofty valuation premium. The biggest downside risk to ESG P/Es going forward appears to be a sharp 'V-shaped' economic recovery, to which we currently assign a low probability.

ESGQ Dimensions

Among the pillar data, Governance and Social factors have appreciated more than the Environmental long/short. Using the eight ESG dimensions that sit beneath each of the ESG pillars, we observe that although the Environmental pillar has lagged, among the dimensions there has been visible dispersion. For example, 'Emissions and Waste' has provided the most positive returns while good 'Resource Efficiency' has delivered weaker returns. In the Social space, 'Human and Labor Rights' adherence has been rewarded more than 'Customer and Community Satisfaction' and 'Employment Policy.' Finally, although Governance factors have been clear winners during the market draw-down, a focus on 'Risk and Controls' has been superior to 'Capital Management.' Overall, COVID-19 appears to have shifted the focus to Social factors with good Governance compared to the period prior to its arrival.

ESGQ, EQ, SQ, and GQ Stock Screens

This chapter includes a number of ESG-related stock screens, highlighting the top and bottom 30 stocks by ESGQ and each pillar. Additionally, we demonstrate the change in price and prospective P/E since the start of the market crash. It is noteworthy that, a) the long screens have fallen less than the shorts, b) prices have fallen faster than valuations, but both are in similar ranges, and c) long screens continue to trade at a premium valuation to their short counterparts.

ESGQ and its pillars show strong Q1 L/S Returns

The Q1 long versus short performance statistics suggest ESGQ has posted +10.4% returns and a Sharpe ratio (risk-adjusted returns) of 0.8.

Among the pillar data, Governance and Social orientated L/S stock screens have generated returns of +12.0% and +11.0%, respectively, and Sharpe ratios > 0.9.

However, it is noteworthy that ESGQ and each of the pillars have recorded positive long versus short returns in Q1.

Table 1: Performance Statistics of ESGQ, EQ, SQ, and GQ Long/Shorts – Q1 Returns

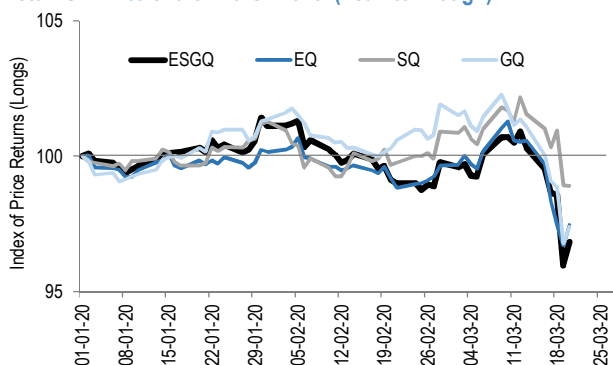
	Returns	Volatility	Max DD	Hit Rate	Sharpe Ratio
ESGQ	10.4%	12.6%	-3.6%	56.9%	0.8
Environmental (EQ)	9.1%	12.4%	-3.8%	58.6%	0.7
Social (SQ)	11.0%	12.4%	-3.6%	58.6%	0.9
Governance (GQ)	12.0%	12.3%	-2.4%	56.9%	1.0

Source: J.P. Morgan Quantitative and Derivatives Strategies

ESGQ marries 1) Stable ESG scores, with 2) Fast Moving ESG score and combines with ESG Momentum.

The long excess returns of the European ESGQ stocks and their respective pillars outperformed the broader market between the start of year.

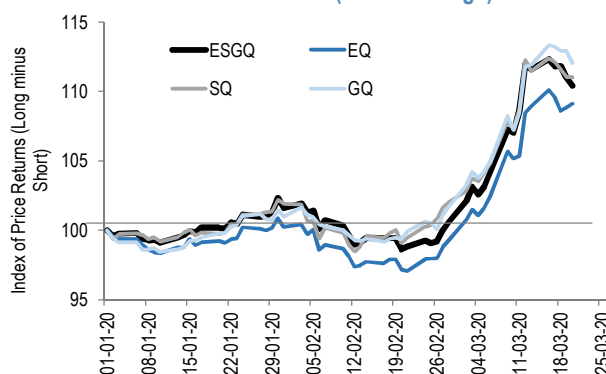
Figure 1: ESGQ, EQ, SQ, and GQ Excess Longs – Index of Daily Returns YTD to end of March 2020. (Peak-to-Trough)



Source: J.P. Morgan Quantitative and Derivatives Strategies

Moreover, the European ESGQ returns provided positive long versus short gains during the period when global equity markets crashed and COVID-19 appeared in developed markets. Among the pillar data, Governance and Social factors appreciated more than the Environmental long versus short returns.

Figure 2: ESGQ, EQ, SQ, and GQ Long/Shorts – Index of Daily Returns YTD to end of March 2020. (Peak-to-Trough)



Source: J.P. Morgan Quantitative and Derivatives Strategies

The following tables show the highest and lowest ranked ESGQ stocks and the change in Price & P/Es.

Table 2: Highest Ranked European ESGQ stocks – Change in Price and Prospective P/E from Peak to Trough (26th March 2020)

BB Code	Name	Sector	ESGQ Rank	Peak (19th Feb, 2020)		Current		Change (%)	
				Prospective P/E	Price (EUR)	Prospective P/E	Price (EUR)	Prospective P/E	Price
	Median			20.5		16.5		-18%	-26%
ASML NA	ASML Holding NV	Information Technology	1	33.1	292.9	28.6	241.4	-14%	-18%
KPN NA	Koninklijke KPN NV	Communication Services	1	19.0	2.5	17.1	2.1	-10%	-17%
WKL NA	Wolters Kluwer NV	Industrials	1	23.9	71.0	20.0	59.1	-16%	-17%
FR FP	Valeo SA	Consumer Discretionary	1	11.2	27.1	8.6	15.8	-24%	-42%
BRBY LN	Burberry Group PLC	Consumer Discretionary	2	21.1	2013.0	17.9	1328.0	-15%	-34%
AKZA NA	Akzo Nobel NV	Materials	2	20.8	86.9	15.0	58.1	-28%	-33%
JMAT LN	Johnson Matthey PLC	Materials	2	11.4	2712.0	8.3	1802.5	-27%	-34%
NOVOB DC	Novo Nordisk A/S	Health Care	2	23.5	444.0	20.3	375.3	-14%	-15%
SGRE SM	Siemens Gamesa Renewable Energy SA	Industrials	3	23.1	16.1	23.4	13.3	1%	-17%
OR FP	L'Oreal SA	Consumer Staples	3	32.0	272.3	31.1	239.5	-3%	-12%
SLHN SW	Swiss Life Holding AG	Financials	3	13.7	521.4	8.4	318.7	-39%	-39%
STJ LN	St James's Place PLC	Financials	3	23.7	1170.5	16.3	756.8	-31%	-35%
ENEL IM	Enel SpA	Utilities	4	16.4	8.6	11.9	6.1	-27%	-29%
SOON SW	Sonova Holding AG	Health Care	4	28.4	256.4	19.3	163.7	-32%	-36%
ELISA FH	Elisa Oyj	Communication Services	4	28.1	57.5	25.9	52.8	-8%	-8%
UPM FH	UPM-Kymmene Oyj	Materials	4	16.2	30.0	14.4	23.4	-11%	-22%
DLG LN	Direct Line Insurance Group PLC	Financials	5	13.2	344.2	10.7	276.6	-19%	-20%
LR FP	Legrand SA	Industrials	5	22.2	77.0	18.5	58.5	-17%	-24%
AIBG ID	AIB Group PLC	Financials	5	8.0	2.3	5.2	1.1	-36%	-51%
SREN SW	Swiss Re AG	Financials	5	13.0	116.8	8.5	69.7	-34%	-40%
VWS DC	Vestas Wind Systems A/S	Industrials	6	20.2	712.4	16.8	541.8	-17%	-24%
CNP FP	CNP Assurances	Financials	6	8.0	17.2	5.1	9.7	-37%	-43%
COLR BB	Colruyt SA	Consumer Staples	6	16.9	46.4	18.6	50.5	10%	9%
ALV GR	Allianz SE	Financials	6	11.4	231.1	7.8	152.9	-31%	-34%
ISP IM	Intesa Sanpaolo SpA	Financials	7	11.3	2.6	6.8	1.6	-40%	-40%
GEBN SW	Geberit AG	Industrials	7	29.1	535.8	24.8	432.3	-15%	-19%
WRT1V FH	Wartsila OYJ Abp	Industrials	7	16.2	10.8	11.0	6.5	-32%	-40%
NESTE FH	Neste Oyj	Energy	7	21.3	39.5	16.1	30.3	-24%	-23%
BEI GR	Beiersdorf AG	Consumer Staples	7	29.5	107.1	27.5	92.1	-7%	-14%
MAERSKB DC	AP Moller - Maersk A/S	Industrials	8	21.9	8562.0	22.0	5882.0	1%	-31%

Source: J.P. Morgan Quantitative and Derivatives Strategies

ESGQ is based on a percentile rank (1= attractive, 100= unattractive), Prospective P/E = 12mth Forward, Price Change is from 19/02/2020 to 26/03/2020.

Table 3: Lowest Ranked European ESGQ stocks – Change in Price and Prospective P/E from Peak to Trough (26th March 2020)

BB Code	Name	Sector	ESGQ Rank	Peak (19th Feb, 2020)		Current		Change (%)	
				Prospective P/E	Price (EUR)	Prospective P/E	Price (EUR)	Prospective P/E	Price
	Median			13.3		9.3		-30%	-38%
GFS LN	G4S PLC	Industrials	100	10.3	203.2	5.6	89.1	-46%	-56%
AVV LN	AVEVA Group PLC	Information Technology	100	43.9	5290.0	29.7	3514.0	-32%	-34%
SECUB SS	Securitas AB	Industrials	100	13.4	148.1	10.4	102.8	-23%	-31%
BATS LN	British American Tobacco PLC	Consumer Staples	100	9.8	3352.0	8.0	2606.0	-19%	-22%
PARG SW	Pargesa Holding SA	Financials	100	27.1	81.5	22.7	64.4	-16%	-21%
VOW GR	Volkswagen AG	Consumer Discretionary	99	5.9	171.3	4.9	117.5	-17%	-31%
VOW3 GR	Volkswagen AG	Consumer Discretionary	99	5.9	170.2	4.8	105.7	-18%	-38%
DANSKE DC	Danske Bank A/S	Financials	99	11.7	120.5	7.0	74.5	-40%	-38%
ERF FP	Eurofins Scientific SE	Health Care	99	21.3	476.0	22.1	427.4	4%	-10%
UTDI GR	United Internet AG	Communication Services	98	12.8	31.3	10.4	25.1	-19%	-20%
MRO LN	Melrose Industries PLC	Industrials	98	16.5	244.9	7.9	104.1	-52%	-57%
AER US	AerCap Holdings NV	Industrials	98	8.1	62.7	3.3	24.9	-59%	-60%
DBK GR	Deutsche Bank AG	Financials	98	31.4	9.9	39.6	5.9	26%	-40%
SAN SM	Banco Santander SA	Financials	97	8.1	3.9	5.3	2.3	-34%	-41%
GLEN LN	Glencore PLC	Materials	97	12.8	232.0	8.7	125.1	-32%	-46%
SVT LN	Severn Trent PLC	Utilities	97	22.5	2696.0	18.7	2197.0	-17%	-19%
AT1 GR	Aroundtown SA	Real Estate	97	19.0	8.8	9.9	4.4	-48%	-50%
ATL IM	Atlantia SpA	Industrials	96	12.1	22.7	7.5	11.6	-38%	-49%
ILD FP	Iliad SA	Communication Services	96	25.6	136.0	27.7	128.0	8%	-6%
YAR NO	Yara International ASA	Materials	96	12.0	382.4	9.2	310.0	-23%	-19%
HEIO NA	Heineken Holding NV	Consumer Staples	96	19.7	93.7	14.6	65.8	-26%	-30%
FRE GR	Fresenius SE & Co KGaA	Health Care	95	13.6	48.5	9.7	33.8	-29%	-30%
WEIR LN	Weir Group PLC/The	Industrials	95	13.9	1355.0	8.7	690.4	-37%	-49%
EDF FP	Electricite de France SA	Utilities	95	16.6	13.5	9.3	7.4	-44%	-45%
TEN IM	Tenaris SA	Energy	95	13.1	9.5	12.1	5.6	-7%	-41%
BHP LN	BHP Group PLC	Materials	94	11.7	1691.6	8.8	1186.8	-25%	-30%
ABN NA	ABN AMRO Bank NV	Financials	94	7.7	15.1	4.9	8.1	-37%	-47%
SESG FP	SES SA	Communication Services	94	17.4	11.1	11.7	5.5	-33%	-50%
SEV FP	Suez	Utilities	94	23.3	15.6	15.4	9.8	-34%	-37%
BAYN GR	Bayar AG	Health Care	93	10.3	75.4	7.0	50.2	-31%	-33%

Source: J.P. Morgan Quantitative and Derivatives Strategies

ESGQ is based on a percentile rank (1= attractive, 100= unattractive), Prospective P/E = 12mth Forward, Price Change is from 19/02/2020 to 26/03/2020.

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JESG indices: Seven years of data bust the myth of ESG underperformance

- **JESG indices perform in lockstep with the baseline indices: Without exception, JESG indices have mirrored the annualized returns and the risk-reward characteristics of their respective baseline indices with greater than 99% correlation, since their inception seven years ago.**
- **Emerging Market sovereigns prove to be a clear beneficiary of ESG alignment: JESG EMBI® has consistently performed better than the baseline EMBI Global Diversified with over 50bps of annualized outperformance over the past seven years.**
- **Positive correlation between ESG quality and performance: Since the inception of the JESG indices, corporates with ESG scores in between 80 and 100 (Band 1) have outperformed lower-quality ESG issuers by 55bps to 200bps annually depending on the region and the asset class.**
- **JESG indices have surpassed \$13 billion in benchmarked assets since launch in 2018: Indexed (also known as passively managed) funds account for more than 50% of the assets benchmarked to the JESG indices, as opposed to the 20% share of indexed funds benchmarked to overall JPM suite of fixed income indices.**
- **JESG's multidimensional ESG approach brings standardization in fixed income ESG investing: Proprietary ESG methodology incorporates several ESG investment approaches into one single benchmark, while benefitting from complementary ESG signals of several ESG vendors for a holistic all-encompassing ESG view.**
- **Ethical/Exclusionary screening and ESG Integration are central to the JESG approach: JESG indices have baseline benchmark exclusions ranging from as high as 26% in the Asia Credit Index (JESG JACI) to 5% in the US High Yield Corporate benchmark (JESG USHYCI).**

ESG Indices – A plethora of available ESG approaches

Socially Responsible Investing (SRI) and Environmental, Social, and Governance (ESG) are widely recognized as a rapidly growing phenomenon across all corners of the financial services industry, channeling an extraordinary volume of assets towards corporations and investment instruments that support sustainable and responsible efforts. This holds true for ESG indices.

The methodologies behind ESG indices are largely synonymous with generic indices, but importantly include “additional” positive or negative ESG tweaks, which lead to the re-weighting or exclusion of some financial instruments within the index. This subsequently results in a benchmark of financial instruments that share relatively stronger ESG characteristics than their generic index counterparts.

As widely cited in industry ([GSIA, 2018](#)), we too segment the variety of ESG investment approaches according to seven different classification standards, namely:

- **ESG Integration:** the systematic and explicit inclusion by investment managers of environmental, social, and governance factors into financial analysis.
- **Positive/Best-In-Class Screening:** investment in sectors, companies or projects selected for positive ESG performance relative to industry peers.
- **Impact/Community Investing:** targeted investments aimed at solving environmental or social problems, and including community investing, where capital is specifically directed to traditionally underserved individuals or communities, as well as financing that is provided to businesses with a clear environmental or social purpose.
- **Sustainability Themed Investing:** investment in themes or assets specifically related to sustainability (for example clean energy, green technology, or sustainable agriculture).
- **Corporate Engagement and Shareholder Action:** the use of shareholder power to influence corporate behavior, including through direct engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines.
- **Ethical/Exclusionary Screening:** the exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria.

- **Norms-Based Screening:** screening of investment against minimum standards of business practices based on international norms, such as those issued by the OECD, ILO, UN, and UNICEF.

JESG Index Suite follows a multi-dimensional ESG view

The J.P. Morgan ESG Index Suite (JESG) was launched in April 2018 with the introduction of the JESG suite of emerging market bond indices. The initial launch covered hard currency sovereigns (JESG EMBI), local currency sovereigns (JESG GBI-EM) and hard currency corporate (JESG CEMBI) asset classes. Following this, our ESG Global High Yield Corporate Index (JESG GHYCI) and Asia Credit ESG Index (JESG JACI) were later launched in 2019. The JESG suite of indices already has more than \$13 billion in assets benchmarked to it.

The J.P. Morgan ESG (JESG) methodology is novel as it aims to bring about standardization in fixed income ESG investing by using a multidimensional approach, incorporating several of the above ESG investment approaches into one single benchmark. Our JESG methodology incorporates:

- **ESG Integration:** overweighting stronger ESG performers and underweighting weaker ones.
- **Positive/Best-In-Class Screening:** removing those issuers that are in the lowest quintile of relative ESG performance.
- **Sustainability Themed Investing:** overweighting green bonds compared to their conventional bond counterparts issued by the same issuer.
- **Ethical/Exclusionary Screening:** excluding those issuers with any direct revenue-exposure to controversial sectors such as Weapons, Tobacco, or Thermal Coal.
- **Norms-Based Screening:** excluding those issuers that are found non-compliant with The Ten Principles of the UN Global Compact.

By thoroughly understanding the pros and cons of the wide variety of ESG vendors within the market, our proprietary ESG index methodology is supported by data from well-established, and importantly, complementary ESG vendors, such as Sustainalytics, RepRisk and Climate Bonds Initiative.

Through the amalgamation of the internal bottom-up ESG scores from Sustainalytics, and complementary

external top-down ESG analysis from RepRisk, coupled with the identification of green bond issuances within Climate Bonds Initiatives' data, our multidimensional ESG methodology brings standardization in fixed income ESG investing.

Taking a holistic view of E, S and G

Taking a holistic ESG view tends to be most challenging when moving away from a pure ethical/exclusionary screening approach towards ESG integration. As the ESG community enhance their ESG maturity, it becomes difficult to not be distracted by the single worst ESG risk of any issuer (mainstay of the exclusionary approach). This is the basis of the JESG's multi-dimensional ESG approach. For example, JESG indices not only integrate and consider the civil liberties and high fossil fuel exposure when it comes to countries within the GCC region, but also focus on aspects such as low incidence of natural disasters, strong social safety net, availability of basic services, food security, etc. Poland is another example—unlike singular ethical/exclusionary approaches that tend to focus on the high proportion of electricity driven by coal, the JESG methodology will weigh-in the benefits of being part of the EU regulatory framework and associated governance benefits, social equality policies and political rights that come along with it. This well-rounded view is unique to the JESG approach, and not easily grasped by actors not as sophisticated in ESG analysis, such as retail investors, financial media, etc.

How do ESG vendors aggregate E, S and G factors?

As with everything in the ESG world, there is no standardization on how these individual factors are aggregated into one single ESG rating or score. For most vendors, it depends on the type of issuer being measured and the vendor's own ESG approach. RepRisk, for example, measures ESG risk factors (i.e., algorithmic screening for negative stories) for various issuers, split between environmental, social and governance risks, which together create their RepRisk Index and RepRisk Rating. However, it is possible that an issuer's ESG risk can entirely stem from Environmental factors alone.

On the other hand, Sustainalytics ESG rating takes a bottom-up approach based on fundamental analysis. Sustainalytics' ESG Ratings Methodology splits corporates between 42 different Peer Groups, with each Peer Group holding a different significance weighting on E, S, and G. Individual E, S, and G scores are thereafter merged into an overall ESG score, depending on their

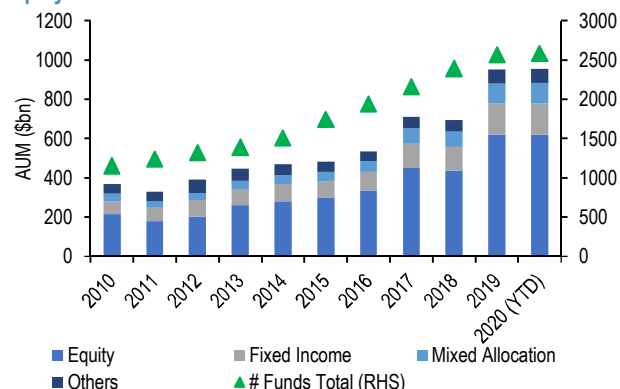
Peer Group ESG weightings. For sovereigns, Sustainalytics methodology grants Governance factors a 50% weight in the ESG, with the rest divided between Social and Environmental factors with Environmental factors having the least weight.

Expecting strong growth in AUM benchmarked to JESG indices

In the two years since launch, JESG indices already have more than \$13 billion in Assets benchmarked to them. Assets benchmarked to the standard and customized versions of the JESG indices are expected to surpass \$20 billion by the end of the year. Most notably, indexed funds account for more than 50% of the assets benchmarked to the JESG indices as opposed to the 20% share of indexed funds benchmarked to overall JPM suite of fixed income indices. We expect this share to be maintained, at least in the near term. Year-to-date, EM bond funds have seen a -\$32.5 billion outflow, while HY funds have seen an estimated -\$8 billion in outflows within the US and Europe. However, anecdotally, we have not heard of ESG funds being impacted by outflows. On the contrary, clients are seeking to create new ESG-aligned funds due to their defensive resilience and in order to build a 3-5 year track record to attract sustainability-focused assets in the future.

For the JESG suite of fixed income benchmarks, Europe has a disproportional share of assets currently benchmarked to the family, also driven by the stronger regulatory framework in the region. Having said that, there has been growing interest from US governing bodies and managers who manage European assets. Regionally, Global Sustainable Investment Alliance's (GSIA) latest biennial report notes that the United States' regional ESG-aligned AUM is increasingly closing in on Europe's managed ESG AUM. However, we note that equity funds account for almost 51% of the assets aligned to ESG which likely have reasonable sponsorship from United States. Fixed income funds account for only 21% of the overall ESG-aligned AUM, with Europe accounting for a majority of assets within fixed income.

Figure 1: ESG-dedicated AUM continues to rise, dominated by equity ESG funds



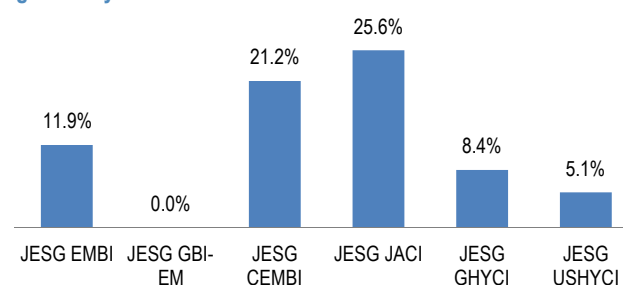
Source: J.P. Morgan.

Does ESG alignment change benchmarks for the better?

Exclusions remain a crucial component of ESG investing

One of the most basic and longstanding forms of incorporating ESG is with an ethical/exclusionary screening approach. From that perspective, the JESG methodology application has led to baseline benchmark exclusions ranging from as high as 25.6% in the Asia Credit Index (JESG JACI) to 5.1% in the US High Yield Corporate benchmark (JESG USHYCI). Due to the limited number of issuers (19 at present) with none of them having JESG scores in the worst quintile, the JESG version of the EM local currency sovereign benchmark (GBI-EM) does not have any exclusions.

Figure 2: Exclusionary screening impacts EM indices significantly more than DM indices



Source: J.P. Morgan. Data as of CoB April 30, 2020

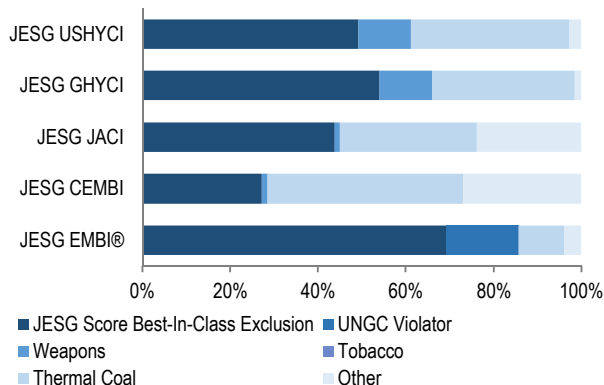
Understandably, Emerging Markets focused benchmarks typically have more exclusions than globally-focused ones since both sovereign and corporate EM issuers on average have worse ESG scores than their Developed Market counterparts. To name a few reasons, EM corporate ESG scores typically trail DM counterparts due

to better quality corporate disclosure and tighter regulatory frameworks, while better governance and policies is a cause for higher sovereign ESG scores in Developed Markets. Secondly, the energy mix in Emerging Markets tends to be less clean, leading to more exclusions due to thermal coal exposure in countries such as, Indonesia, Russia, Colombia, and South Africa.

Reasons for exclusion vary depending on the asset class

Best-in-class related exclusions are more prevalent in sovereign-heavy indices such as the JESG EMBI, which covers EM hard currency sovereign and quasi-sovereign issuers. Across corporate-focused indices, it is the controversial sector-related exclusions (primarily thermal coal and weapons exposure) that seem to be the main culprit.

Figure 3: Best-in-class criteria dominates the exclusion list in the sovereign-focused JESG EMBI



Source: J.P. Morgan. Data as of CoB April 30, 2020

An EM-focused corporate index like JESG CEMBI has a higher proportion of coal exclusions (45% of all index exclusions) than a global-focused JESG Global HY (32% coal exclusion) or JESG US HY (36% coal exclusions). However, corporate issuers with direct exposure to weapons are also more prevalent in

Developed Markets High Yield (largest being ThyssenKrupp) than Emerging Markets.

PEMEX, a Mexican quasi-sovereign, is the largest issuer tagged as being non-compliant with UNGC principles. As per our ESG vendors, PEMEX is non-compliant with the UNGC’s Principle 1 on Supporting and Respecting Human Rights. Saudi Arabia’s Aramco is the largest exclusion from the JESG CEMBI, since its JESG score has dipped into the last quintile. For the same reason, Netflix is the largest exclusion from the Global and US High Yield indices while China’s Sinopec is the largest exclusion from the JESG JACI.

ESG integration helps incentivize better ESG performing issuers

By overweighting the good ESG performers and underweighting the not-so-good, ESG integration allows for capital to be directed towards more responsible and sustainable issuers. In JESG benchmarks, ESG integration seems to have had the largest impact on the sovereign-focused indices like the JESG EMBI (EM hard currency sovereigns) and JESG GBI-EM (EM local currency sovereigns). The extent of overweight and underweight is lower in corporate-focused indices owing to the sheer number of issuers present in these benchmarks. Moreover, we promote positive ESG actions by overweighting those issuers who have issued green bonds even if the security does not meet the initial index ESG criteria. For example, JESG CEMBI includes green bonds from China’s ICBC despite the issuer having a JESG score below 20. Conventional (non-green) bonds from ICBC are not included in the JESG CEMBI.

One can see within the JESG GBI-EM index the significance for being a part of the EU. Four of the top five ESG overweight countries are Emerging Markets who are part of the Europe Union, and so benefitting from their regulatory frameworks and governing support.

Table 1: JESG methodology has resulted in issuer Overweights/Underweights in a wide range from +358bp to -319bp

JESG EMBI

	ESG Overweight (bps)		ESG Underweight (bps)
Uruguay Republic	259	PEMEX	-196
Panama Republic	162	Nigeria Republic	-143
Abu Dhabi Government	104	Sinopec	-110
Poland Republic	95	Petronas	-99
Hungary Republic	81	Kingdom of Saudi Arabia	-81

JESG GBI-EM

	ESG Overweight (bps)		ESG Underweight (bps)
Czech Republic	267	Russia	-319
Malaysia	185	Turkey	-117
Poland	109	China	-74
Hungary	100	Mexico	-54
Romania	79	Indonesia	-54

JESG CEMBI

	ESG Overweight (bps)		ESG Underweight (bps)
Macau Sands China	135	Saudi Aramco	-140
Turkey Isbank	55	First Quantum Minerals	-107
Singapore Telecom	52	Russia Gazprom	-89
Altice	51	Abu Dhabi Taqa	-77
Taiwan Hon Hai Precision	50	Macau Melco Resorts	-62

JESG JACI

	ESG Overweight (bps)		ESG Underweight (bps)
Indonesia Republic	358	Sinopec	-232
Philippines Republic	158	CNOOC Ltd	-201
Hong Kong AIA Group	94	China's ICBC	-182
Macau Sands China	88	Alibaba	-123
CK Hutchison	79	Tencent	-123

JESG Global HY

	ESG Overweight (bps)		ESG Underweight (bps)
Sprint Corp	80	Netflix	-78
Ball Corp	21	China Evergrande	-68
Telefonica	17	Ford Motor	-66
Virgin Media	15	Charter Communications	-38

JESG US HY

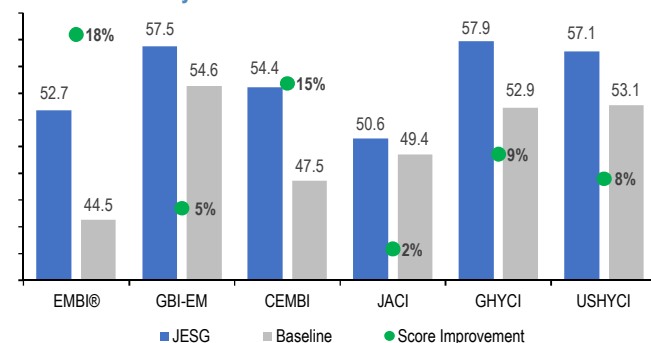
	ESG Overweight (bps)		ESG Underweight (bps)
Sprint Corp	144	Ford Motor	-106
United Rentals	26	Netflix	-97
Springleaf Finance	25	Charter Communications	-76
Ball Corp	23	Bausch Health	-62
Nielsen Finance	21	Tenet Healthcare	-50

Source: J.P. Morgan. Data as of CoB April 30, 2020

All-in-all, did the benchmarks have a beneficial impact from ESG parameters?

The multi-dimensional approach to incorporating ESG has helped JESG indices score a lot higher than their respective baseline counterparts on ESG. The largest improvement in JESG score is seen in the JESG EMBI (covering EM hard currency sovereigns) which, incidentally, also has the highest proportion of Best-in-class (i.e., JESG score being in the bottom quintile) exclusions. JESG GBI-EM shows the least improvement in JESG scores given the fewer number of issuers and no exclusions within the index.

Figure 4: JESG methodology has improved the ESG-ness of baseline indices by as much as 18%



Source: J.P. Morgan. Data as of CoB April 30, 2020

Myth busted: ESG investing does not require sacrifice in performance

JESG indices have performed in-line with their baseline indices over the long term

JESG indices have, without exception, mimicked the performance and risk-reward characteristics of their respective baseline indices since their inception over seven years ago. The correlation (Table 2) in performance between the JESG and the baseline index is over 99%. **Despite the defensive nature, JESG indices**

show comparable long-term returns (Table 3). The resilient nature of the JESG indices can be seen in the fact that these indices outperformed their respective baselines so far in 2020 and even in 2018. For some investors, JESG indices are a no-brainer as they almost exactly reflect the underlying risk-reward characteristics of the asset class, while making sure their capital is aligned to having wider sustainable impact.

Table 2: JESG indices show at least 99% correlation with the underlying baseline index

	EMBIG Div	JESG EMBI	GBI-EM	JESG GBI-EM	CEMBI Broad Div	JESG CEMBI	JACI	JESG JACI	GCI HY	JESG GCI HY	US HY	JESG US HY
EMBIG Div	1.00											
JESG EMBI	0.99	1.00										
GBI-EM	0.79	0.78	1.00									
JESG GBI-EM	0.79	0.77	1.00	1.00								
CEMBI Broad Div	0.95	0.93	0.75	0.74	1.00							
JESG CEMBI	0.94	0.93	0.74	0.73	1.00	1.00						
JACI	0.91	0.93	0.66	0.65	0.88	0.87	1.00					
JESG JACI	0.91	0.92	0.65	0.65	0.88	0.87	1.00	1.00				
GCI HY	0.85	0.82	0.73	0.72	0.91	0.91	0.71	0.71	1.00			
JESG GCI HY	0.84	0.81	0.72	0.72	0.91	0.90	0.70	0.70	1.00	1.00		
US HY	0.81	0.78	0.65	0.65	0.87	0.87	0.69	0.69	0.97	0.97	1.00	
JESG US HY	0.81	0.78	0.65	0.64	0.88	0.87	0.69	0.69	0.97	0.97	1.00	1.00

Source: J.P. Morgan. Data as of CoB April 30, 2020

Table 3: JESG indices have a similar risk-reward characteristic as the baseline indices

	EMBIG Div	JESG EMBI	GBI-EM	JESG GBI-EM	CEMBI Broad Div	JESG CEMBI	JACI	JESG JACI	GCI HY	JESG GCI HY	US HY	JESG US HY
TR 2013	-5.3%	-5.0%	-9.0%	-8.0%	-0.6%	-0.2%	-1.4%	-1.0%	7.2%	7.5%	6.5%	6.7%
TR 2014	7.4%	8.8%	-5.7%	-6.1%	5.0%	4.1%	8.3%	8.3%	0.8%	0.8%	2.4%	2.7%
TR 2015	1.2%	1.1%	-14.9%	-15.4%	1.3%	1.5%	2.8%	2.9%	-4.5%	-4.0%	-5.0%	-4.4%
TR 2016	10.2%	8.8%	9.9%	9.6%	9.7%	8.8%	5.8%	5.5%	15.3%	15.0%	17.7%	18.5%
TR 2017	10.3%	10.7%	15.2%	15.6%	8.0%	7.7%	5.8%	5.8%	10.3%	10.3%	7.1%	6.9%
TR 2018	-4.3%	-3.8%	-6.2%	-5.9%	-1.6%	-1.4%	-0.8%	-0.9%	-3.4%	-3.7%	-2.0%	-2.4%
TR 2019	15.0%	15.9%	13.5%	11.9%	13.1%	12.8%	11.3%	11.2%	13.6%	13.3%	13.9%	13.8%
YTD 2020	-11.4%	-10.1%	-11.9%	-11.1%	-6.5%	-6.2%	-1.8%	-2.1%	-9.5%	-9.5%	-8.5%	-8.7%
Cum Return	22.0%	26.1%	-13.3%	-13.4%	30.1%	28.9%	33.3%	32.9%	30.3%	30.3%	33.2%	34.6%
Annualized Return	2.7%	3.2%	-1.9%	-1.9%	3.7%	3.5%	4.0%	4.0%	3.7%	3.7%	4.0%	4.1%

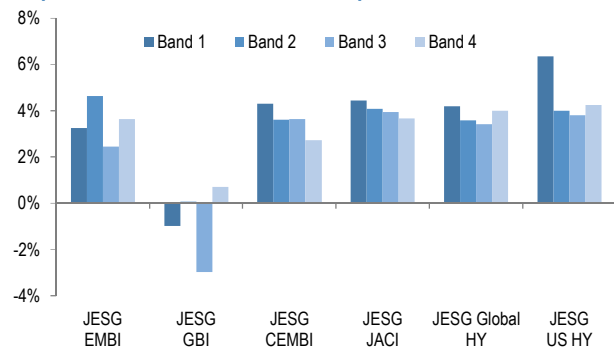
Source: J.P. Morgan. Data as of CoB April 30, 2020

Corporate indices show positive correlation between ESG quality and performance

The JESG methodology splits issuers into quintiles based on their JESG scores, with Band 1 containing the best ESG performers scoring between 100 and 80, Band 2 containing issuers with JESG score between 80 and 60, and so forth. As a result, the JESG bands help when analyzing the financial performance of issuers based on their ESG quality. Historically, ESG corporate-focused indices such as the CEMBI, JACI, Global HY and US HY, all show a clear positive correlation between ESG quality and performance (Figure 5). In all cases throughout the suite of corporate benchmarks, annualized returns of JESG Band 1 issuers is higher than those across other bands.

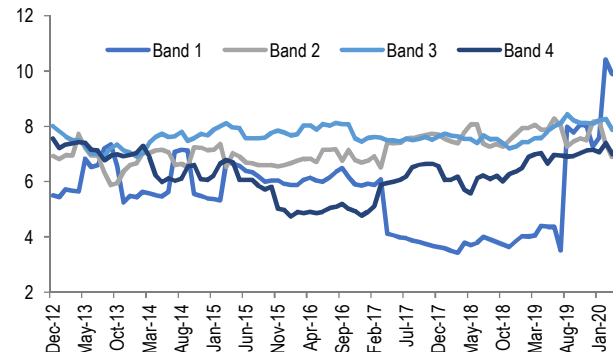
Interestingly, sovereign-focused indices, such as the JESG EMBI and JESG GBI-EM, do not exemplify the same ESG quality and performance correlation as the corporate counterparts. However, this is primarily attributed to duration and credit ratings. The duration of issuers in Band 1 from years 2013 to 2019 was significantly lower than other bands in the index (Figure 6). In addition, the average credit rating of securities with ESG scores in between 100 and 80 possessed an average credit rating as much as two notches higher than instruments represented in Bands 2 – 4.

Figure 5: Higher ESG quality showed better annualized returns in corporate-focused indices since inception in 2012



Source: J.P. Morgan.

Figure 6: JESG EMBIG Band 1 duration has been historically lower than duration of other bands



Source: J.P. Morgan.

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ESG and global macro investing: Enhancing the top-down framework

- **Investor demand for frameworks to measure country-level ESG performance and risk has risen considerably over the past few years, in part due to mandates from and scrutiny by asset owners. The rationale is that ESG country ratings can help measure risk to a country's long-term performance and asset market returns.**
 - **To meet this growing interest, we propose three enhancements to a 2018 framework for integrating ESG into macro investing. First, we expand the universe of countries covered from 31 to 75. Second, we add a new indicator of environmental performance, tracking the share of renewables of total primary energy, to the E factor. Third, we refine the calculation methodology for the scores.**
 - **Key highlights from the latest update to our ESG scorecard include: a) positive trends in environmental and social criteria remain broad-based and firmly in-place; b) convergence of EMs to DMs persists and displays no signs of slowing; and c) minimal adjustments to the league table in line with the multi-year nature of ESG trends.**
 - **Cross-sectional regression results of the latest ESG factors on returns are strongest for Spreads and seem marginally better for the Social and Governance pillars. But a few caveats make us stick to the original conclusions that the Environmental measure remains the most tradable pillar and that Equities are the best vehicle for expressing ESG views in macro markets.**
 - **Results could have been distorted by deep market drawdowns in December 2018, the US-China trade war and the correlation between market-based measures of risk such as Credit spreads and our ESG score. Further, even in the original panel regression setup, environmental, social and governance pillars did not explain much of the variation in returns and were not highly significant, which means that we should not be too concerned about year-on-year return patterns as ESG factors are more relevant over strategic horizons.**
 - **A current application of our approach would suggest to OW China Equities outright or versus countries with stable/declining E metrics such as numerous countries in the Middle East. A second possibility would be to OW EM Equities versus DM Equities on the basis of the underlying convergence process in ESG scores.**
-

Meeting growing needs for an enhanced ESG top-down framework

Investors' demand for frameworks to measure country-level ESG performance and risk has risen considerably over the past few years. Appetite for ESG integration into a traditional investment framework is growing amongst investors, in part due to mandates from and scrutiny by asset owners. In the macro space, one example is represented by the increasing demand for country risk ratings, which are used by fixed income investors to monitor the exposure of the portfolio to ESG risks and gain ESG insights not explicitly captured in sovereign bond ratings and traditional credit analysis. The rationale is that ESG country ratings can help measure risk to a country's long-term performance and asset market returns.

In 2018, we introduced a framework for integrating ESG into macro investing, and in this note, we propose three amendments to meet growing interest in the subject. Our scorecard approach captures overall and disaggregated ESG performance for the main DM and EM investable countries over a long-term sample of more than 20 years. The composite score is constructed as a simple arithmetic average of three underlying pillars measuring country-level Environmental, Social and Governance performance (see [ESG and global macro investing: Potential profits versus practical challenges](#) by J. Normand and F. Manicardi, May 2018).

This month we enhance the original framework via three main changes. First, we have expanded the universe of countries covered from 31 to 75. This mainly goes to the advantage of investors by offering more granularity in monitoring ESG performance/risks as well as rating sovereign portfolios. **Second, we have added a new indicator of environmental performance to the E factor.** This new metric tracks the share of primary energy coming from renewable fuels. The E factor particularly benefits from the inclusion of this additional variable given that it was grounded on a less comprehensive set of indicators compared to our S and G factors. Further, this makes our conceptual framework for measuring environmental performance more robust and practical as it now mirrors the [2030 EU climate and](#)

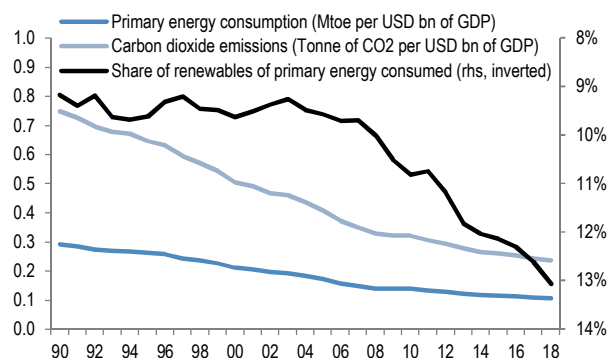
[energy framework](#)¹. **Third, we have refined the calculation methodology for the scores.** For each indicator behind our ESG factors, we use a cumulative distribution approach to derive a standardized set of scores. In practice, this means that we assume that the underlying indicators are distributed normally, and we use the cumulative distribution rescaled by 10 as the score. Originally, given our focus on back testing, we have used an expanding panel to calculate the first two moments of the empirical distribution. Hence, ratings were indexed to an expanding sample. Now, instead, the full panel of observations is used. The obvious benefit is that over-time comparisons should now be cleaner and our scores should better reflect changes in fundamentals. Further, this makes our methodology more comparable with what is used by alternative indicators of ESG performance (e.g., [Yale Environmental Performance Index](#)).

Despite the improvements to our ESG scorecard/rating approach, we continue to view it as a complement to existing frameworks for global macro investing. Our previous work examined the relationship between ESG factors and returns (see [ESG and global macro investing: Potential profits versus practical challenges](#) by Normand and Manicardi from May 2018) and came to the **tentative answer to the question of whether high or improving ESG scores influence economy-wide asset prices of: “Yes, but not by much”** after controlling for cyclical factors. This is because our empirical analysis has shown that environmental, social and governance pillars (both individually and combined) do not explain much of the variation in asset market yoy returns, while they are more successful over strategic horizons. Hence our conclusion that these structural ESG factors are akin to demographics in how they influence macro markets slowly over several years. **Furthermore, several challenges remain to deploy an ESG framework** and actively trade ESG factors. This primarily stems from the characteristics of the indicators available i.e., a) very **low frequency** of input variables (mostly annual); b) **long lags** for updates (typically multi-month but usually annual); c) **short samples** (especially for the handful of daily and monthly measures) and; d) a **lack of comprehensive indicators** capturing the full spectrum of country-level ESG considerations. Our ESG scorecard approach is not immune to these criticisms, which is why we only view

this as a complement to existing frameworks for global macro investing.

In the rest of this short note we will focus on: a) updating the ESG criteria with the latest available data and highlighting key trends and changes; b) inspecting cross-sectional regression results based on the latest returns and ESG factors and c) wrapping everything up and spotlighting investment recommendations suggested by our ESG framework.

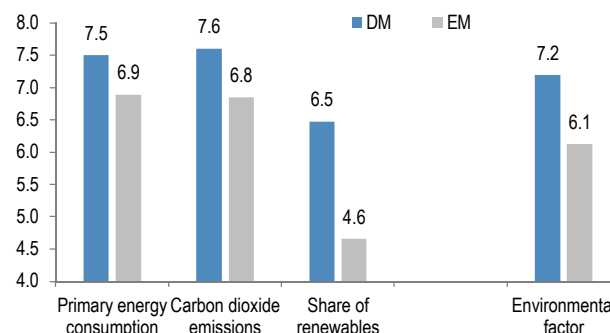
Figure 1: The virtuous trend in environmental efficiency persists
 Average carbon dioxide emissions, energy intensity and share of renewables of primary energy consumed. Sample covers 1990-2018 and 75 DM and EM investable countries.



Source: J.P. Morgan, BP Statistical Review of World Energy

Figure 2: While EMs and DMs are comparable on emissions and energy intensity, EMs still lag in the widespread adoption of renewables

Carbon dioxide emissions per unit of GDP, primary energy consumption per unit of GDP and share of renewables of primary energy consumed. Latest country scores.



Source: J.P. Morgan, BP Statistical Review of World Energy

¹ [2030 climate & energy framework](https://ec.europa.eu/clima/policies/strategies/2030_en), European Commission
https://ec.europa.eu/clima/policies/strategies/2030_en

Single criteria: Environmental factor

Our upgraded E pillar is now based on three underlying indicators: a) **energy intensity**, which is calculated as millions of tons of oil equivalent (Mtoe) of primary energy consumed annually per USD billions of GDP (PPP-adjusted); b) **carbon dioxide emissions** per unit of GDP; and c) the newly added **share of renewables** of primary energy consumed. All of these indicators, in our view, are reliable proxies of a country's environmental performance as they are key objectives/targets of numerous governments' energy policy agendas.

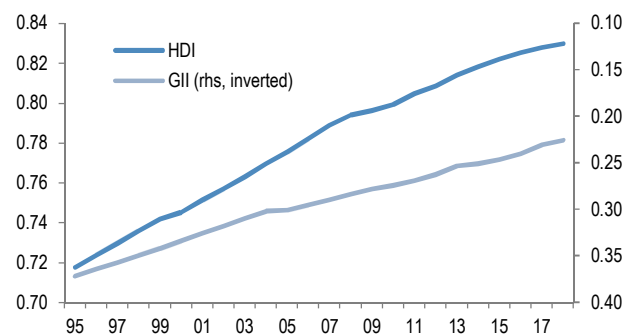
The virtuous trend in environmental efficiency remains intact. As Figure 1 shows the average level of primary energy consumption and carbon dioxide emissions per unit of GDP have been on a downward trend for almost 30 years. Similarly, the share of renewables has increased for the past three decades and the cross-sectional average has now exceeded 13% for the first time. The pace of improvement has been slowing over time for the first two metrics, but we think that this is not worrisome as the marginal effectiveness of newer technologies and policies should naturally decrease over time, and more importantly the trend has given no signs of reversal. On the contrary, progress on the mix of energy sources has accelerated over the past decade as renewables are increasingly becoming economically viable and competitive relative to traditional fossil fuels. Our indicators of environmental performance are positively correlated, and when looking at emissions and energy intensity there are no substantial differences between EMs and DMs. However, EMs remain laggard in widespread adoption of renewables (see Figure 2). Finally, while the trend in environmental efficiency is positive, it is certainly not sufficient to stop environmental degradation. Carbon dioxide emissions have been on a multi-year downtrend only for OECD countries, but at the global level they have been steadily advancing over the years, which implies that carbon intensity has improved only because emissions have increased less than GDP.

Overall, most countries improved on the composite E pillar. Table 3 summarizes 2020 and 2019 scores and rankings for the expanded set of EM and DM countries. In our latest update the improvement along the E criteria remains broad-based, with 58 countries reporting a higher reading and only 17 countries reporting a lower level. The smallest increases in score were seen for the top 10th percentile of countries while the highest

improvements were concentrated in countries in the top 40th to 10th percentile of the league table. The number of countries switching places in the league table has been higher compared to the S factor but most of these changes remained small in magnitude. Quite importantly, there was no change to the top/bottom three countries. Switzerland, Sweden and Denmark remain the most virtuous, while South Africa, Ukraine and Trinidad and Tobago retain the lowest readings. The countries evidencing the greatest and smallest improvements in scores were Sri Lanka and Iran, respectively. China has kept performing strongly for more than a decade, echoing the combined effect of government policies around pollution control and development of alternative energy sources.

Figure 3: Both the HDI and GII keep improving at a steady pace...

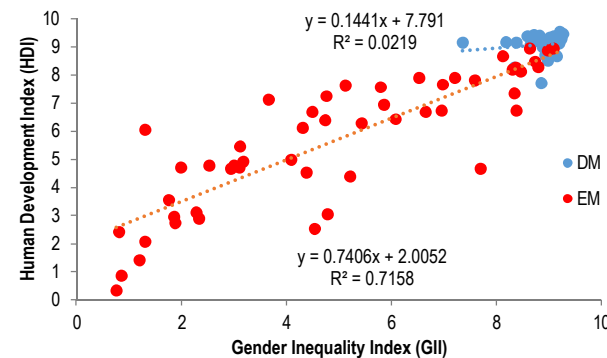
Average Human Development Index (HDI) and Gender Equality Index (GII). Sample covers 1995-2018 and 75 DM and EM investable countries.



Source: J.P. Morgan, UNDP

Figure 4: ... but differences remain between DMs and EMs

Human Development Index vs Gender Inequality Index, latest scores.



Source: J.P. Morgan, UNDP

Single criteria: Social factor

Our Social pillar is based on the Human Development Index and the Gender Inequality Index, both of which are available since the mid-90s. The former is a

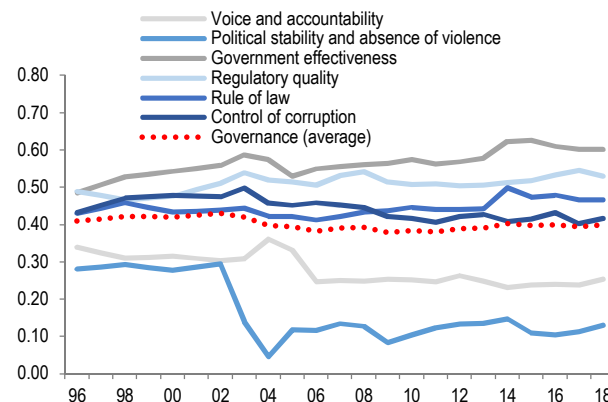
comprehensive metric, scaled from zero to one, tracking development across three dimensions, i.e., health, knowledge and standard of living. The latter is also scaled from zero to one, but it is focused on the narrowed theme of gender equality, with higher values indicating lower gender parity. It measures inequalities in three important aspects: a) reproductive health; b) empowerment; and c) economic status.

The multi-year trend in HDI and GII is positive and shows no signs of slowing. Figure 3 shows that both HDI and GII have been advancing for the past 25 years with a stable pace. Nonetheless, as Figure 4 illustrates, there is still a substantial gap between EM and DM countries along the Social factor. DM countries are clustered around the upper bound of the HDI and GII scales, while EM countries are more dispersed. In our view, part of the observed intra-group variation is explained by a relatively high correlation between economic development and our social factors.

Overall, the social criteria have been rising for most countries in the sample. As Table 3 highlights, there are only six countries reporting a lower score in our latest update, while for the rest of sample the level is higher. The data suggests some convergence to the top. The largest improvements were seen for countries sitting in the 20th to 60th percentile of the distribution, while the smallest gains were observed for those in the top 20th percentile. Changes to the league table were not material but they were less frequent compared to the E factor. In this latest update there is no change to the top/bottom three countries. Norway, Switzerland and Sweden remain the most virtuous while the three countries with the lowest score are still Pakistan, Bangladesh and India. The countries evidencing the greatest and smallest improvement in scores were Latvia and Venezuela, respectively.

Figure 5: Governance has remained on average stable over the past 25 years, reflecting mixed trends for the underlying indicators

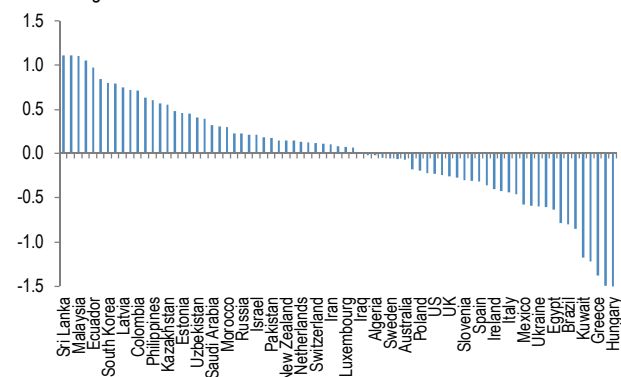
Average level of World Bank governance indicators. Sample covers 1996-2018 and 75 DM and EM investable countries.



Source: J.P. Morgan, World Bank

Figure 6: The lack of a clear trend masks intra-sample variation

10Y change in Governance score.



Source: J.P. Morgan, World Bank

Single criteria: Governance Factor

Our Governance factor is composed of six underlying indicators. These six indicators are all measured on a -2.5 to +2.5 scale and come from the World Bank. They combine the views of a large number of enterprise, citizen and expert survey respondents in industrial and developing countries and each addresses a specific aspect of Governance quality: a) Voice and accountability; b) Political stability and absence of violence; c) Government effectiveness; d) Regulatory quality; e) Rule of law; and f) Control of corruption.

Compared to the E and S factors, Governance quality has remained stable over time. While E and S criteria have been steadily advancing, average Governance quality has remained broadly stable over the past 25 years (Figure 5). Overall this reflects mixed developments in the underlying indicators. Over the 1996-2018 sample period, Governance progressed when measured in terms of government effectiveness, while the increase was more moderate when looking at regulatory quality and rule of law. On the contrary, Governance worsened more eminently in terms of voice and accountability and political stability and absence of violence but it was more stable in terms of control of corruption. In a similar way to the social factor, there is substantial difference between the DM and EM subsample as countries belonging to the former group are clustered at the top of the distribution for each aspect of Governance quality.

The stability in the average Governance score masks some intra-sample variation. As Table 3 at the end of this chapter shows, Governance has roughly improved in half of the countries and worsened in the other half, and this was in-line with the changes over 10-year period (Figure 6). Some convergence to the top was also observed for the Governance factor as best performing countries were concentrated in the bottom half of the league table. Changes to the relative rankings were slightly more frequent compared to the Social factor (46 in total), but nonetheless modest. Switzerland has replaced Finland and joined New Zealand and Norway at the top of the league table. Iran has replaced Uzbekistan at the bottom of the league table with Iraq and Venezuela. The countries evidencing the greatest and smallest improvement in scores are Malaysia and Israel, respectively.

Composite criteria

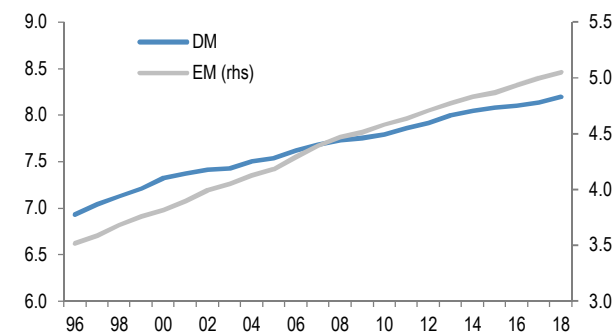
The J.P. Morgan Composite ESG criteria is a simple arithmetic average of the Environmental, Social and Governance pillars. The composite ESG criteria have been rising steadily for the past 25 years, mirroring improvements in the Environmental and Social factors. Over the same period, EM countries have started from a lower level, but they have been advancing at a faster pace (Figure 7). More broadly, this trend reflects the convergence process by which less virtuous countries catch up with the best in class.

Most countries' ESG scores improved last year, and changes to the league table have been minor. As Table

3 highlights, 13 countries reported a lower score in our latest update, while the composite ESG criteria increased for the remaining 62 countries. Similarly to the underlying factors, the countries reporting the largest improvement belong to the middle portion of the league table while changes for countries scoring at the top/bottom tails were more modest. Changes to the league table are not material and somewhat infrequent (32 in total). In this latest update, Switzerland, Sweden and Denmark remain at the top of the league table while Pakistan, Bangladesh and Iraq hold on to the lowest positions. The countries evidencing the greatest and smallest improvement in scores are Malaysia and Iran, respectively. Over the past 10 years China is the country scoring the largest increase in the aggregate ESG score while Venezuela is the country falling the most.

Figure 7: The ESG factor keeps rising and the convergence process for EMs remains in place

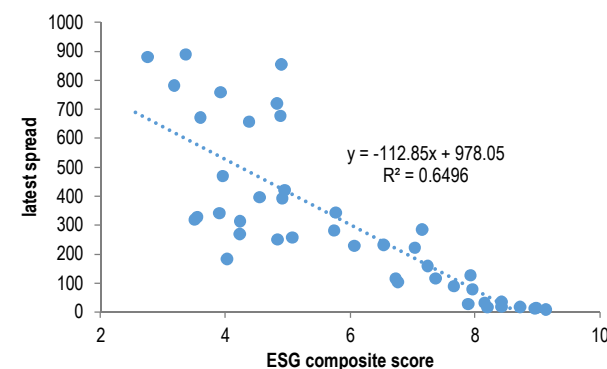
Average ESG composite score for EM and DM countries. Sample covers 1996-2018 period.



Source: J.P. Morgan, BP Statistical Review of World Energy, UNDP, World Bank

Figure 8: Market-based measures of risk such as Credit spreads and equity/currency volatility are correlated with our ESG factor

Latest country spread (CDS for DM and spread to UST for EM) vs latest ESG composite score.



Source: J.P. Morgan

ESG factors and returns

Our previous research uncovered the relationship between ESG factor improvements and macro market returns. In our original paper (see [ESG and global macro investing: Potential profits versus practical challenges](#) by Normand and Manicardi from May 2018) we used panel regression analysis to establish whether positive changes in the environmental, social, governance and composite factors were associated with positive returns in equities, sovereign bonds and currencies. The main conclusions we derived were: a) **ESG factors** (individually and combined) **do not explain much of the variation in asset market returns, and they are akin to demographics in how they influence macro markets slowly over several years,** b) **only one of the ESG factors—environmental—appears to have a positive influence on macro market performance,** and c) **Equities seem to exhibit the strongest and more consistent sensitivity to ESG factors.**

Cross-sectional regression results based on latest returns and ESG factors are strongest for Spreads and seem marginally more positive for the Social and Governance pillars. Table 1 and 2 report the coefficients, T-stat and R-squared of regressing yoy returns on Equities and Currencies and Spread changes on the most recent changes and levels for the ESG factors. The tables also show the result of a multivariate model where yoy changes in GDP are used to control for differences in business cycle influences. Differently from the past we have used GDP growth rates rather than country-specific PMIs with the aim of expanding the cross section of countries. **Equities** exhibit the weakest and least consistent sensitivity to ESG factors. The coefficients for Equities have the expected sign in only 2 out of 16 regressions, and results are never significant when controlling for growth. Results for **Spreads** are somewhat stronger and more in line with our expectations. Coefficients have mixed signs and no statistical significance in the set of regressions using score changes. However, results are always in line with expectations and significant at 1% confidence in 6 out of 8 cases when looking at score levels. Results for **Currencies** are somewhat in the middle. Coefficients are never significant after controlling for growth but have signs often in line with expectations. Looking at factors, there is no clear winner but results seem marginally better for the Social and Governance pillars.

But two caveats make us skeptical in overturning the conclusions reached in our previous research. First,

yoy returns (which refer to 2018) are highly distorted by the correction during the second half of December and the US-China trade war. Further, market-based measures of risk such as Credit spreads (Figure 8), and volatility of equities and currencies are correlated with our ESG factor suggesting that highly ranked countries should fall less in corrections while countries improving the most (those with in the middle of the league table) should have fallen more. Hence, the considerable likelihood that results were distorted. **Second**, even in the original panel regression setup, environmental, social and governance pillars (both individually and combined) did not explain much of the variation in asset market yoy returns and were not highly significant, which means that we should not be too concerned about yoy return patterns as ESG factors are more relevant over strategic horizons.

Table 1: Cross-sectional regression results based on latest data are strongest for Spreads...

Result from regressing yoy returns/changes on latest ESG score changes. Sample covers 62 countries for Equities, 47 countries for Spreads and 32 countries for currencies. Yoy growth rates in GDP (measured in international dollars) are used to control for business cycle effect.

	Equities		Spreads		Currencies	
Environmental						
Score change	-9%	-5%	72	66	2%	4%
T-stat	-0.7	-0.4	0.6	0.6	0.1	0.2
Including GDP		Yes		Yes		Yes
R-squared	1%	7%	1%	2%	0%	17%
Social						
Score change	42%	33%	-72	-25	4%	-5%
T-stat	1.7	1.3	-0.3	-0.1	0.3	-0.4
Including GDP		Yes		Yes		Yes
R-squared	5%	10%	0%	1%	0%	17%
Governance						
Score change	-4%	-8%	-6	12	5%	2%
T-stat	-0.4	-0.8	-0.1	0.1	0.9	0.3
Including GDP		Yes		Yes		Yes
R-squared	0%	8%	0%	1%	3%	17%
ESG						
Score change	-6%	-10%	50	87	13%	3%
T-stat	-0.2	-0.4	0.2	0.4	0.9	0.2
Including GDP		Yes		Yes		Yes
R-squared	0%	7%	0%	2%	3%	17%

Source: J.P. Morgan, Markit, BP Statistical Review of World Energy, UNDP, World Bank

Table 2: ...and seem marginally better for the Social and Governance pillars

Result from regressing yoy returns/changes on latest ESG score level. Sample covers 62 countries for Equities, 47 countries for Spreads and 32 countries for currencies. Yoy growth rates in GDP (measured in international dollars) are used to control for business cycle effect.

	Equities		Spreads		Currencies	
Environmental						
Score level	-2%	-2%	-14	-16	0%	0%
T-stat	-1.58	-1.35	-1.3	-1.4	-0.3	0.2
Including GDP	Yes		Yes		Yes	
R-squared	4%	10%	4%	6%	0%	17%
Social						
Score level	-1%	0%	-15	-21	0%	0%
T-stat	-1.55	-0.59	-3.0	-3.9	-0.6	0.4
Including GDP	Yes		Yes		Yes	
R-squared	4%	7%	17%	27%	1%	18%
Governance						
Score level	-1%	-1%	-17	-21	0%	0%
T-stat	-1.70	-0.97	-3.9	-4.7	0.0	1.0
Including GDP	Yes		Yes		Yes	
R-squared	5%	8%	25%	34%	0%	20%
ESG						
Score level	-2%	-1%	-25	-32	0%	0%
T-stat	-1.97	-1.13	-3.7	-4.6	-0.3	0.8
Including GDP	Yes		Yes		Yes	
R-squared	6%	9%	23%	34%	0%	19%

Source: J.P. Morgan, Markit, BP Statistical Review of World Energy, UNDP, World Bank

Conclusions

Investors' demand for frameworks to measure country-level ESG performance and risk has risen considerably over the past few years. Appetite for ESG integration into a traditional investment framework is growing amongst investors, in part due to mandates from and scrutiny by asset owners. The rationale is that ESG country risk ratings can help measure the risk to a country's long-term prosperity and economic development by assessing how sustainably it is managing its resources.

To meet the growing interest in the subject we have proposed three amendments to the original framework for integrating ESG into macro investing that we introduced in 2018. First, we have expanded the universe of countries covered from 31 to 75 with the aim of offering more granularity in monitoring ESG performance/risks as well as rating sovereign portfolios.

Second, we have added a new indicator of environmental performance to the E factor. This is based on the share of renewables of total primary energy and make our conceptual framework for measuring environmental performance more robust.

Third, we have refined the calculation methodology for the scores. The obvious benefit is that over-time comparisons should now be cleaner, and our scores should better reflect changes in fundamentals. Further, this makes our methodology more comparable with what is used by other indicators of ESG performance.

Key highlights from the latest update to our ESG scorecard include: a) positive trends in environmental and social criteria remain broad-based and firmly in-place; b) convergence of EMs to DMs persists and displays no signs of slowing and c) minimal adjustments to the league table in line with the multi-year nature of ESG trends.

Cross-sectional regression results of the latest ESG factors on returns are strongest for Spreads and seem marginally more positive for the Social and Governance pillars. But a few caveats make us stick to the original conclusions that the Environmental measure remains more tradable and Equities are the best vehicle to trade ESG. Results could have been distorted by the deep drawdowns in December 2018, the US-China trade war and the correlation between market-based measures of risk such as Credit spreads and our ESG score. Further, even in the original panel regression setup, environmental, social and governance pillars did not explain much of the variation in returns and were not highly significant, which means that we should not be too concerned about yoy return patterns as ESG factors are more relevant over strategic horizons.

A current application of our approach would suggest to OW China Equities outright or versus countries with stable/declining E metrics like numerous countries in the Middle East. **A second possibility would be to OW EM Equities versus DM Equities** on the basis of the underlying convergence process in ESG scores.

Table 3: JPM individual and composite ESG scores and rankings

JPM Environmental (E), Social (S), Governance (G) and composite ESG ranking and score for 2020 and 2019. Countries sorted based on latest ESG composite score.

	E factor				S factor				G factor				ESG factor			
	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)
Switzerland	8.7	8.7	1	1	9.3	9.4	2	2	9.3	9.3	4	2	9.1	9.1	1	1
Sweden	8.5	8.5	3	2	9.3	9.3	3	3	9.2	9.1	5	6	9.0	9.0	2	2
Denmark	8.5	8.5	2	3	9.2	9.3	5	5	9.0	9.1	9	8	8.9	9.0	3	3
Norway	8.1	8.2	9	8	9.3	9.4	1	1	9.3	9.2	2	3	8.9	8.9	4	4
Finland	7.8	7.8	12	15	9.2	9.2	8	7	9.3	9.2	3	4	8.7	8.7	5	5
New Zealand	8.1	8.2	11	10	8.6	8.7	24	24	9.4	9.3	1	1	8.7	8.7	6	6
Austria	8.4	8.5	4	4	9.0	9.0	16	14	8.6	8.7	14	14	8.7	8.7	7	7
Germany	7.2	7.4	21	21	9.1	9.1	10	10	8.7	8.8	13	13	8.4	8.4	8	8
Ireland	7.5	7.7	18	18	9.0	9.1	11	11	8.4	8.5	17	15	8.3	8.4	9	9
Iceland	6.7	6.8	32	33	9.2	9.2	6	6	8.8	8.9	12	12	8.2	8.3	11	10
Canada	6.7	6.8	31	32	8.9	9.0	17	13	9.1	8.9	7	10	8.2	8.2	10	11
Netherlands	6.1	6.2	46	44	9.3	9.3	4	4	9.1	9.1	6	7	8.1	8.2	13	12
Luxembourg	6.4	6.4	37	38	9.0	8.9	12	16	9.1	9.2	8	5	8.2	8.2	12	13
UK	7.2	7.3	24	23	8.7	8.8	22	22	8.5	8.4	15	17	8.1	8.1	14	14
Portugal	7.7	8.1	14	11	8.2	8.3	29	31	7.7	7.6	22	22	7.9	8.0	16	15
Japan	6.5	6.6	35	34	8.8	8.9	19	19	8.5	8.4	16	16	7.9	8.0	15	16
Australia	5.7	5.9	59	57	9.0	9.0	15	15	8.8	8.9	11	11	7.8	7.9	17	17
France	6.8	7.0	28	27	8.9	8.9	18	18	7.7	7.7	21	21	7.8	7.9	18	18
Slovenia	7.1	7.4	25	22	9.0	8.9	14	17	7.1	7.2	25	25	7.7	7.8	19	19
Belgium	6.0	6.1	48	47	9.1	9.2	9	9	7.9	7.9	20	20	7.7	7.7	20	20
Spain	7.3	7.5	20	20	8.8	8.8	20	20	6.6	6.7	30	29	7.5	7.7	21	21
Singapore	4.5	4.6	72	70	9.2	9.2	7	8	9.0	9.0	10	9	7.5	7.6	22	22
US	6.0	6.1	47	48	8.0	8.2	33	32	8.2	8.1	18	18	7.4	7.5	23	23
Latvia	8.3	8.0	8	14	7.3	7.7	37	35	6.6	6.6	29	30	7.4	7.4	25	24
Lithuania	7.0	6.9	27	29	8.2	8.2	31	33	7.0	7.0	26	27	7.4	7.4	24	25
Italy	7.5	7.6	19	19	8.7	8.7	23	23	5.4	5.4	35	35	7.2	7.2	27	26
Czechia	5.9	6.0	53	54	8.4	8.4	27	27	7.3	7.2	23	24	7.2	7.2	26	27
Chile	7.6	7.7	16	17	6.1	6.4	45	44	7.1	7.4	24	23	7.0	7.1	31	28
Estonia	4.7	4.7	70	68	8.5	8.6	26	25	8.0	8.1	19	19	7.0	7.1	29	29
Cyprus	5.9	6.0	54	52	8.5	8.5	25	26	6.9	6.7	27	28	7.1	7.1	28	30
Croatia	7.8	8.1	13	12	7.8	7.8	34	34	5.3	5.2	37	38	6.9	7.0	32	31
South Korea	5.0	5.0	63	64	9.0	9.0	13	12	6.7	7.0	28	26	6.9	7.0	33	32
Israel	6.0	6.0	49	50	8.7	8.8	21	21	6.3	6.1	31	33	7.0	7.0	30	33
Poland	6.0	5.9	52	56	8.2	8.3	30	28	6.1	6.0	33	34	6.8	6.8	35	34
Slovakia	6.5	6.5	34	36	7.5	7.5	35	36	6.3	6.1	32	31	6.8	6.7	34	35
Greece	6.6	6.8	33	31	8.3	8.3	28	29	4.1	4.5	42	40	6.3	6.5	36	36
UAE	4.6	4.6	71	69	8.1	8.3	32	30	6.0	6.1	34	32	6.2	6.3	37	37
Hungary	6.2	6.3	42	42	6.5	6.7	42	41	5.4	5.3	36	37	6.0	6.1	38	38
Romania	7.6	7.7	17	16	5.5	5.6	49	49	4.2	4.0	41	42	5.8	5.8	39	39

	E Factor				S Factor				G Factor				ESG Factor			
	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)	Score (2019)	Score (2020)	Rank (2019)	Rank (2020)
Qatar	5.0	5.1	61	61	7.2	7.3	38	38	4.7	4.8	38	39	5.7	5.7	40	40
Malaysia	6.0	6.0	51	51	5.7	5.9	48	48	4.5	5.3	39	36	5.4	5.7	42	41
Bulgaria	5.8	6.2	58	45	6.6	6.7	41	42	4.3	4.3	40	41	5.6	5.7	41	42
Argentina	6.8	6.8	30	30	5.4	5.4	50	51	3.4	3.4	46	46	5.2	5.2	43	43
Sri Lanka	7.6	8.2	15	9	4.2	4.3	56	56	2.9	2.8	48	51	4.9	5.1	48	44
Peru	8.4	8.5	5	5	3.8	3.9	59	59	2.9	2.9	47	49	5.1	5.1	44	45
Brazil	8.4	8.5	7	6	3.7	3.9	62	60	2.7	2.5	53	54	4.9	4.9	46	46
Saudi Arabia	4.9	5.0	64	63	7.1	7.2	39	39	2.4	2.5	54	53	4.8	4.9	49	47
Colombia	8.4	8.4	6	7	3.6	3.6	63	63	2.7	2.7	52	52	4.9	4.9	47	48
Oman	4.8	4.8	67	67	6.0	6.0	47	47	4.0	3.9	43	43	4.9	4.9	45	49
Turkey	7.2	7.3	23	24	5.3	5.6	51	50	1.8	1.8	62	63	4.8	4.9	50	50
China	5.8	6.0	55	49	6.1	6.2	46	46	2.2	2.3	58	57	4.7	4.8	52	51
Belarus	5.2	5.2	60	60	7.4	7.5	36	37	1.5	1.7	64	64	4.7	4.8	51	52
Kuwait	5.0	5.1	62	62	6.2	6.2	44	45	2.7	2.9	51	48	4.6	4.8	53	53
Ecuador	8.1	8.0	10	13	3.8	3.8	60	61	1.8	2.0	63	62	4.5	4.6	54	54
Kazakhstan	4.8	4.6	66	71	6.8	6.8	40	40	2.1	2.2	61	58	4.5	4.5	55	55
Mexico	6.4	6.5	38	37	4.4	4.5	55	54	2.2	2.1	59	60	4.3	4.4	56	56
Vietnam	7.1	7.0	26	26	3.4	3.5	64	64	2.2	2.1	57	61	4.2	4.2	57	57
Russian Federation	4.8	4.9	65	66	6.3	6.4	43	43	1.3	1.4	65	65	4.1	4.2	58	58
Thailand	5.8	6.0	57	55	3.9	4.0	57	57	2.4	2.4	55	55	4.0	4.1	59	59
Philippines	7.2	7.2	22	25	2.6	2.7	67	66	2.2	2.2	60	59	4.0	4.0	60	60
Azerbaijan	6.1	6.1	45	46	4.4	4.4	54	55	1.2	1.3	67	67	3.9	4.0	61	61
Trinidad and Tobago	2.8	2.8	75	75	5.2	5.2	52	52	3.8	3.7	45	45	3.9	3.9	62	62
Indonesia	6.5	6.4	36	39	2.3	2.4	69	69	2.7	2.9	50	50	3.8	3.9	63	63
South Africa	4.2	4.3	73	73	2.6	2.6	68	68	3.9	3.9	44	44	3.6	3.6	64	64
India	6.3	6.4	40	40	1.2	1.3	73	73	2.8	3.0	49	47	3.4	3.5	66	65
Morocco	6.4	6.5	39	35	1.7	1.7	71	71	2.3	2.3	56	56	3.4	3.5	65	66
Algeria	5.8	5.8	56	59	3.3	3.3	65	65	0.9	1.0	70	69	3.3	3.4	67	67
Ukraine	3.8	4.0	74	74	4.7	4.8	53	53	1.2	1.3	66	66	3.2	3.4	68	68
Uzbekistan	4.7	5.0	69	65	3.9	3.9	58	58	0.7	0.8	73	71	3.1	3.2	71	69
Egypt	6.2	6.2	43	43	2.2	2.3	70	70	0.9	1.0	71	70	3.1	3.2	70	70
Iran	4.8	4.4	68	72	3.7	3.7	61	62	0.9	0.7	69	73	3.1	2.9	69	71
Venezuela	6.2	6.0	44	53	2.8	2.7	66	67	0.2	0.1	75	75	3.0	2.9	72	72
Pakistan	6.8	7.0	29	28	0.5	0.5	75	75	0.8	0.7	72	72	2.7	2.8	74	73
Bangladesh	6.3	6.3	41	41	0.8	0.8	74	74	1.0	1.0	68	68	2.7	2.7	73	74
Iraq	6.0	5.9	50	58	1.5	1.6	72	72	0.2	0.2	74	74	2.6	2.6	75	75

Source: J.P. Morgan, BP Statistical Review of World Energy, UNDP, World Bank

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From pandemics to climate catastrophes: What are the best long-term hedges?

- **The COVID-19 pandemic prompts parallels to climate-related catastrophes. Both are global and existential threats sometimes neglected by policymakers and ignored by investors because they seem intangible or remote until they actually strike.**
- **Reluctance to build resilience until a catastrophe crystallizes a wildcard is understandable given the scarce resources of most governments, corporates or households. But a focus on the near rather than the long term can also mistake a baseline for a tail risk. Extreme climate events are such an example: their frequency and intensity is increasing so consistently on some measures that calling them aberrations downplays their potential significance as this century's baseline.**
- **So far, market impacts have been confined to Credit for lower-income territories or sovereigns where a climate event catalyzes a long-standing debt sustainability problem. Markets in G10 economies have rarely moved more than intra-week on environmental issues, since an event has yet to trigger a multi-sigma loss in output or a permanent shock to productive capacity. Japan came closest in 2011.**
- **But the absence of green swans outside of small countries isn't comforting when the trend appears to be towards highly-destructive events. When such a catastrophe hits a major economy is conjectural, which is why structural hedges should be focused on instruments with an asymmetric bias in coming years. Agricultural commodities are one possibility because of their cheapness, but this sector's long-term co-movement with Energy prices makes their profile less clear than for other hedges detailed below.**
- **For US exposure, the best long-term hedges for a growth shock from a climate catastrophe are the yen, Gold and Quality stocks, since the hedge value of Bonds has fallen as 10Y yields approach the zero bound and Equity/Bond correlations collapse. For European and Japanese exposure, Bonds hold even less value because rates are lower across the curve than in the US.**

- **Shorting the currency is the better option for a growth shock. The best disaster insurance for EM economies is also long USD exposure, particularly now that cash rate differentials to the USD (hedging costs) are record-low in all regions and sub-5% in all but three countries (Turkey, Mexico, Russia).**

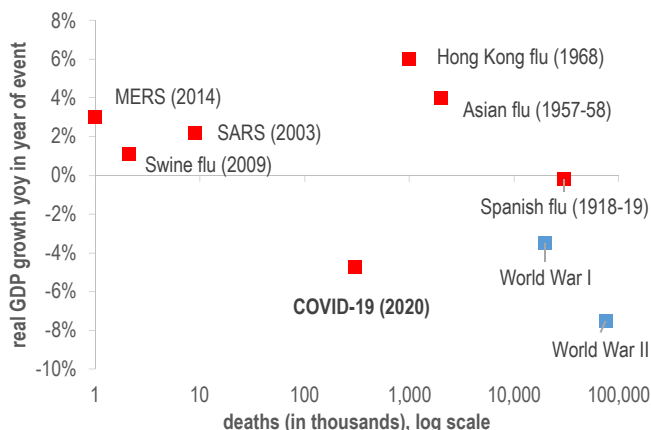
Parallels between pandemics and climate catastrophes

Preventing COVID-19 from becoming an even deadlier pandemic has instead made this outbreak one of the most economically-destructive events of the past 125 years, a period that includes two World Wars, the Great Depression and the Global Financial Crisis (Figure 1). And as occurs after wars, financial crises and humanitarian disasters, the current environment is breeding the usual spectrum of hindsighters (“this was always so obvious”), retributionists (“someone’s got to pay for this”) and leaders (“we should learn from this”).

A similar range of voices now links the current pandemic and a future climate-related catastrophe. The logic is that both public health and environmental crises present global and existential threats sometimes neglected by policymakers and ignored by investors because they seem intangible and remote, until they actually strike (Figure 2). Both types of events impact the same cohorts disproportionately within and across countries—lower-income groups and sovereigns—so also raise moral questions of fairness. To be sure, pandemics and climate catastrophes are not the 21st century’s only systemic threats. An economically-debilitating cyberattack or a nuclear strike belong on the board too given the number of rogue states with capabilities in these areas. But public health and the environment are the two that will occupy the most mindscape for the next few years given that a public health focus will run concurrent with an annual succession of visible climate events each year. The next several months provide a test case for the intersection of these two themes as the US attempts to manage the reinfection risks from a return to work alongside the possibility of another severe hurricane season due to record-warm oceans.

Figure 1: Preventing COVID-19 from becoming a more deadly pandemic made it instead one of the most destructive economic events in over a century

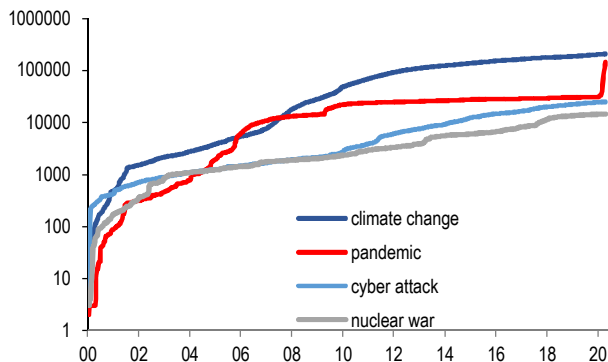
Total fatalities and peak-to-trough changes in global real GDP during five worst respiratory epidemics of past century plus two World Wars.



Source: J.P. Morgan

Figure 2: Of 21st century swans—climate catastrophe, a pandemic, global cyberattack and nuclear war—the pandemic has struck first

Cumulative number of news stories on climate change, pandemics, cyberattacks, and nuclear war since 2000. Log scale.



Source: J.P. Morgan, Bloomberg

The unfortunate fact of the policymaking process, which sometimes mirrors investor pricing of macroeconomic scenarios, is that countries almost never anticipate the timing and location of the next crisis even if they eventually implement measures to reduce the odds of recurrence. Thus, neither the oil supply nor undercapitalized banks nor unfunded European sovereigns are core to the current crisis as these issues were to recessions in the 1970s, the Global Financial Crisis, or the EMU Crisis, respectively. Individuals have already undertaken behavioral shifts to reduce the likelihood of COVID-19 infections (hygiene, masks, social distancing), and businesses will be required to do the same as pre-conditions for reopening (changes

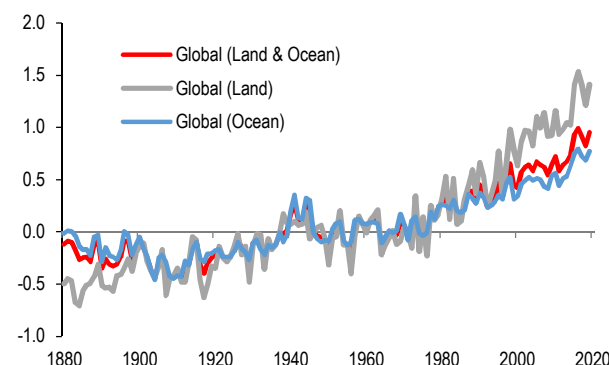
to location strategy and office density plus screening). Governments have the longer-term task of building a public health infrastructure capable of managing the COVID-19 infection cycle and preparing for the next Disease X via testing, contact tracing, treatment, surveillance and vaccination. This virus may exist for years—only a global mass vaccination program would eradicate it—but it's less likely to be the source of the next crisis.

Mistaking a baseline for a tail risk

The reluctance to build resilience until a catastrophe crystallizes a wildcard is understandable given scarce resources for most governments, corporates or households. But a focus on the near rather than the long term can also mistake a baseline for a tail risk. Extreme climate events are such an example in markets, though more for local rather than for global assets so far. Trends sometimes mislabeled as aberrations include: a steady rise in land and ocean temperatures over the past 40 years, notably in Europe, Asia and North America (Figures 3 and 4); the rising frequency and intensity of severe weather events such as Category 4 and 5 hurricanes in the Atlantic and Pacific; wildfires in the US, Australia and Brazil (Figures 5 and 6); flooding unrelated to hurricanes/typhoons/cyclones; and extreme heat not associated with wildfire-prone areas (urban areas).

Figure 3: Global land and ocean temperatures, which were stable from 1950s to 1980s, have been trending higher over past 40 years

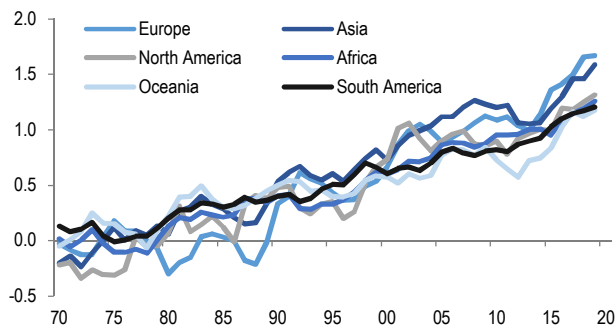
Global average temperature anomalies for land and oceans, expressed as deviation in degrees Celsius from 20th century mean.



Source: J.P. Morgan, US NOAA

Figure 4: Warming trends have accelerated over the past decade, most notably in Europe

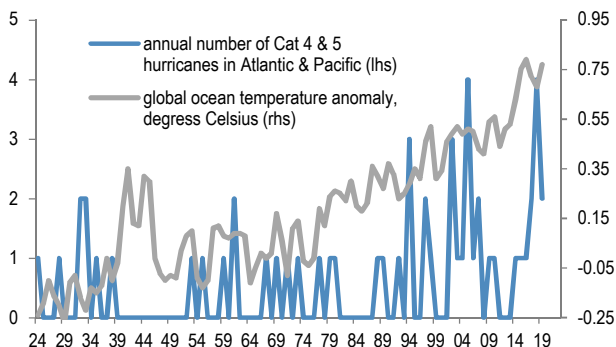
Regional average temperature anomalies for land, expressed as deviation in degrees Celsius from 1910-2000 mean. 5Y moving average plotted below.



Source: J.P. Morgan, US NOAA

Figure 5: Frequency and severity of Pacific and Atlantic hurricanes has increased over the past 20 years

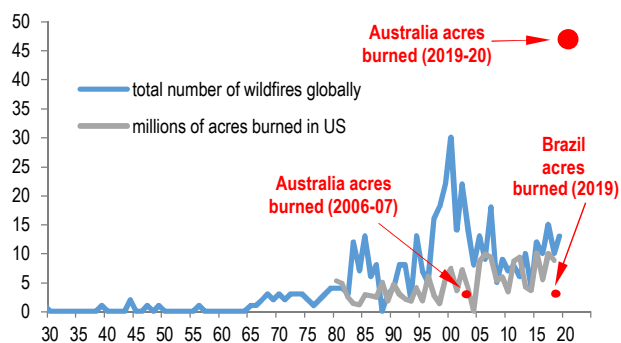
Total number of category 4 and 5 Atlantic and Pacific hurricanes annually vs global ocean temperature anomaly (deviation from long-term average).



Source: J.P. Morgan, US NOAA

Figure 6: Frequency and destructiveness of wildfires have been increasing over the past decade

Total number of wildfires globally and millions of US acres burned (due to data limitations). Red dots show total acres burned in recent Brazil and Australia fires.



Source: J.P. Morgan, US National Interagency Fire Center, Emergency Events Database

But in contrast to the sharp economic and market impacts from pandemics like SARS and COVID-19, climate catastrophes have rarely made an imprint on asset prices. The most severe hurricanes to hit the US generate more than \$100bn in damages, but these sums are small relative to GDP (less than 0.5%) and are recouped later through reconstruction. Hence why US equity, credit and bond markets rarely move beyond intra-week around these events, even if sectors, single stocks and some commodities do (or example, due to oil and gas production shut-ins or crop damage). Japanese Equities and the yen experienced huge swings in response to the 2011 Tohoku earthquake and nuclear scare (-20% move in stocks, +9 percentage point spike in FX volatility), though the cause of this event was more of the inevitably-geological rather than the man-made environmental type.

Non-USD currencies have weakened during environmental crises such as droughts/energy crises in Brazil (2014-15) and water shortages in South Africa (2017-18), but it is tough to disentangle the local influence when the trade-weighted dollar was also rising during those episodes. The Australian dollar barely moved in trade-weighted terms during the late 2019/early 2020 bushfires, nor did its bond market outperform the US materially.

The most notable market impacts have come in **municipal and sovereign credit markets** for lower-income and therefore exceedingly vulnerable borrowers, where the economic dislocation of a climate catastrophe can catalyze a long-standing debt sustainability problem. Examples include Hurricane Maria's (2017) role in Puerto Rico's debt crisis (2017); Cyclone Idai's (2019) for Mozambique, Malawi and Zimbabwe; and drought's impact (multi-year) on Zambia.

Hedging: the problem of when, where and how

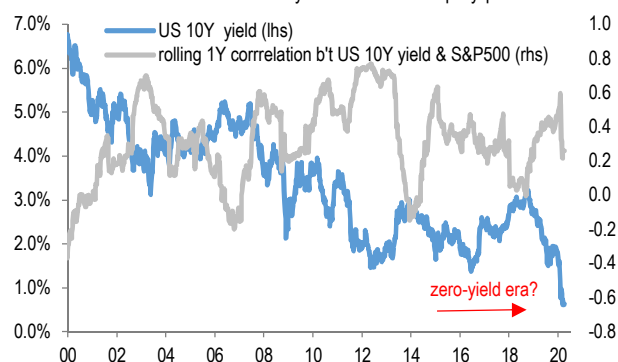
The fact that green swans have only become financial events for small islands and/or low-income sovereigns shouldn't comfort when the trend appears to be towards highly-destructive events. Perhaps the economic impact of a climate catastrophe must be multi-sigma in nature or entail a permanent loss of productive capacity to matter for a major market, as Japan foreshadowed in 2011. When such an event happens is conjectural, which is why structural hedges to manage climate catastrophes in liquid markets should be focused on those with an asymmetric bias in coming years.

Agricultural commodities are one possibility because of their cheapness, but this sector's long-term co-movement with Energy prices (through cost structure and biofuels substitutability) makes the price profile less clear than for other hedges detailed below. An Agricultural index should be part of a portfolio of hedges, but it would be insufficient as a sole source of insurance, particular for events outside of major crop-producing regions.

For the US, the list of markets that hedge against a growth shock from a climate catastrophe has narrowed now that US Treasury yields are approaching the zero lower bound, and thus have less scope to rally on an adverse event (see Figure 7 and [The limits to Japanization as a global investment theme](#) J. Normand, 30 July 2019). Aside from extending **duration**, the remaining options are those that show a consistent tendency to outperform when Equities decline, such as the **yen** and **Quality versus Value Equities** (Figure 8). Treasuries, the yen and Quality stocks have delivered in 80-90% of major equity drawdowns over the past decade and have relatively little downside over the next year or two given how loose US monetary policy will remain through both policy rates and Fed asset purchases. **Gold** has rallied less consistently during extreme Equity moves (64% success rate), but its role as a hedging instrument will likely grow in a low interest rate environment. **Cryptocurrencies** have yet to demonstrate hedge effectiveness (success rate of 30% during extreme market moves), despite the association some make between apocalyptic events and the unique use case for private money

Figure 7: Correlation between US 10Y yields and Equities could drop to near zero as rates approach the lower bound, thus reducing hedge effectiveness

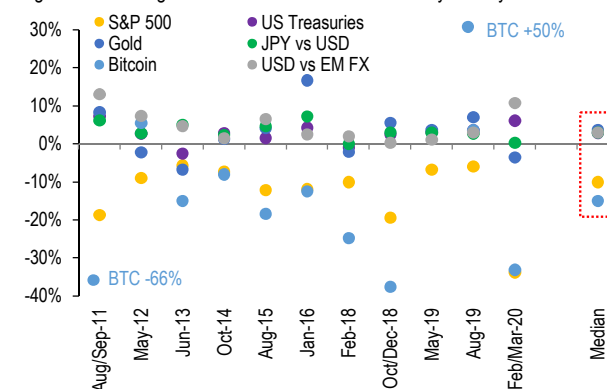
Rolling 1Y correlation of weekly changes in US 10Y yields and S&P500. Positive correlation indicates that yields fall when equity prices decline.



Source: J.P. Morgan

Figure 8: Assets that rise most consistently when Equities decline are USD vs EM FX, USTs and JPY; crypto FX has little hedge value

Returns on defensive assets during S&P500's largest drawdowns of past decade. X axis dates correspond to months of drawdown. Bitcoin returns in Aug 2011 and Aug 2019 are written in because they lie beyond the scale.

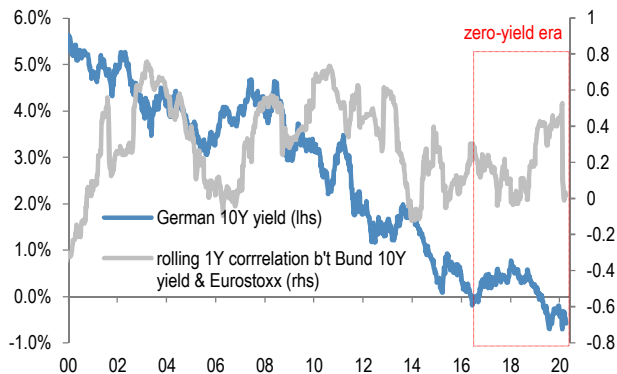


Source: J.P. Morgan

In some non-US economies, hedging options have shrunk more than for US exposure. In Europe, German 10Y yields are already negative across the curve and the Equity/Bond correlation has fallen to zero (Figure 9), which eliminates duration for hedging climate risk in Europe. **Japanese** investors face a similar constraint. The Gold price is unlikely to serve non-US investors concerned about a non-US catastrophe since bullion's price is more linked to US monetary policy than to any non-US factor. The European and Japanese options are mainly to own US dollars for a local shock, particularly given lower availability of Quality stocks. The best disaster insurance for **EM economies** is also long USD exposure, particularly now that cash rate differentials to the USD (hedging costs) are record-low in all regions and sub-5% in all but Turkey, Mexico and Russia (Figure 10). These are admittedly uncreative hedges, but simple and liquid are decent criteria when considering insurance that might need to be carried for years.

Figure 9: Correlation between German 10Y yields & Equities has already dropped to zero, implying no hedge protection

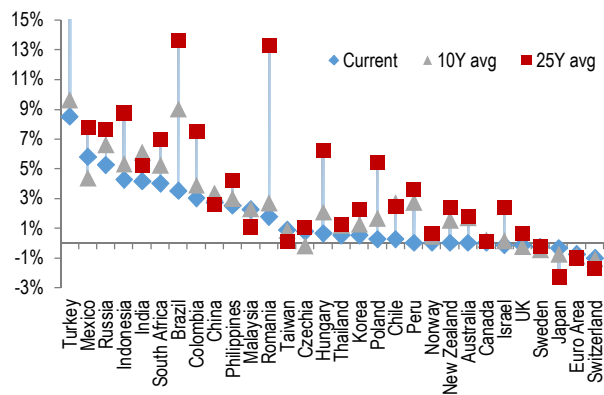
Rolling 1Y correlation of weekly changes in German 10Y yields and EuroStoxx 600. Positive correlation indicates that yields fall when equity prices decline.



Source: J.P. Morgan

Figure 10: FX hedging costs are below average in every country, and below 5% annually for every country but Turkey, Mexico and Russia

Non-US cash rate minus US cash rate currently versus average of past 10Y and 25Y



Source: J.P. Morgan

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Pace of ESG adoption among retail investors slows in 2020 following a strong 2019

- **The approaches by which investment managers take ESG issues into account vary widely from very soft and relatively unconstrained approaches to more active and systematic ones. Given the majority of ESG approaches fall into the former camp rather than the latter, there is little doubt that ESG surveys in general overstate the “true” ESG investment universe.**
- **We proxy the pace of ESG adoption by the difference between the AUM growth of ESG-focused funds and the AUM growth of the overall fund universe.**
- **The strong pace of ESG adoption during 2019 does not appear to have spilled over into 2020.**

Previously we had noted in [J.P. Morgan Perspectives: ESG Investing Goes Mainstream](#), “How big is the ESG universe?” May 25, 2018 that widely followed surveys such as the Global Sustainable Investment (GSI) Alliance survey likely overstate the “true” ESG investment universe; i.e., the universe of investments where ESG factors are systematically and actively incorporated into investment processes and decisions, by perhaps a factor of ten. While the release on April 1, 2019 of the 2018 GSI Alliance survey had shed some light on more recent ESG trends, we believe that this survey overstated the growth of ESG universe. In particular, a year ago we had argued in [ESG Investing 2019: Climate changes everything](#) that the reported 34% growth in ESG assets between the beginning of 2016 and the beginning of 2018, versus 25% between 2014 and 2016, should not be interpreted as an acceleration in the pace of ESG adoption. We had instead viewed this 34% growth as reflecting the strong equity market performance during the 2016/2017 period rather than faster ESG adoption pace relative to previous years.

What is more controversial in our opinion in the GSI Alliance survey and in ESG surveys more generally, is the reported amount of ESG assets. In the GSI Alliance 2018 survey, for example, that amount totaled \$31trn when the survey was conducted at the beginning of 2018, or a quarter of the global investment universe. In our opinion, this number hugely overstates the “true” ESG investment universe (i.e., the universe of investments

where ESG factors are systematically and actively incorporated into investment processes and decisions). This is because the GSI Alliance survey, and most other ESG surveys, use a wide range of ESG investment definitions ranging from shareholder engagement when it is in fact standard proxy voting, and negative screening for a handful of companies, or industries, to more systematic ESG integration and positive screening (i.e., investment in sectors, companies, or projects selected for positive ESG performance relative to industry peers).

In other words, the approaches by which investment managers take ESG issues into account vary widely from very soft and relatively unconstrained approaches to more active and systematic ones. Given the majority of ESG approaches fall into the former camp rather than the latter, there is little doubt that ESG surveys in general overstate the “true” ESG investment universe. For example, in the 2018 GSI Alliance survey, less than 6% of reported global sustainable investment assets incorporated positive/best-in-class screening, and this share has changed little from the 2016 survey.

While ESG surveys mostly incorporate institutional investor mandates such as pension funds, endowments, foundations, or insurance companies, our ESG fund universe (\$720bn as of Q1 2018) mostly consists of retail investor focused funds. For example, in the 2018 GSI Alliance survey, three quarters of global sustainable investment assets are institutional and only one quarter consists of retail assets. In other words, institutional ESG assets could be three times larger relative to retail ESG assets. Given our assessment above that retail ESG assets (proxied by the fund universe with ESG related attributes) could be on the order of \$720bn, then institutional ESG assets could be on the order of \$2.2trn. This implies close to \$3trn of total ESG assets, which represents a tenth of the \$31trn reported by the 2018 GSI Alliance survey.

In fact, we had found that in the more retail investor driven fund space, where we have better return and flow data, the pace of ESG adoption had slowed between 2016 and 2018 relative to the 2014-2016 GSI Alliance survey period. We proxy the pace of ESG adoption by the difference between the AUM growth of ESG-focused funds and the AUM growth of the overall fund universe. To gauge the ESG fund universe we look at various fund types, such as mutual funds, investment trusts, ETFs, and hedge funds, and filter out those with ESG-related attributes in their mandate (i.e., those with General Attribute “ESG,” “environmentally friendly,” “socially responsible,” “climate change,” and “clean energy” in a Bloomberg fund

search). In addition, we also added funds, which in their description contained words like “ethical,” “green,” “impact investing,” “social,” “environmental,” “governance,” “ESG,” and “SRI”. Out of 133,000 funds, our filtering process produced only 2,500 funds, or less than 2% of the Bloomberg fund universe.

Our ESG adoption proxy based on the difference between the AUM growth of the ESG fund universe compared to the overall fund universe, is shown in Table 1. 2018 saw a significant slowdown of inflows relative to the preceding which had spilled over into 1Q19, but the speed of ESG adoption picked up through 2019. However, this strong pace of ESG adoption during 2019 does not appear to have spilled over into 2020. In fact by looking at the relative change between the AUM growth of ESG-focused funds and the AUM growth of the overall fund universe, the relative growth has effectively been zero in 2020 YTD, even slower than the 5% seen during 2018. This result also holds if we only focus on equity funds in Table 2. In 2020 the AUM of the equity only ESG fund universe declined by -11% versus a decline of -13% for the overall equity fund universe, so the difference between the two was +2%. In 2019 the difference between the two was +13%, so 2020 so far saw a significant decline from 2019.

Table 1: ESG fund universe growth

A detailed description of the ESG fund universe can be found in the text.

Annual growth rate			
	ESG Universe Growth	All Fund AUM	Difference
2014	51%	7%	44%
2015	15%	3%	12%
2016	20%	6%	14%
2017	36%	22%	14%
2018	0%	-5%	5%
2019	30%	1%	28%
2020	-9%	-9%	0%

Source: Bloomberg, J.P. Morgan calculations

Table 2: ESG Equity fund universe growth

A detailed description of the ESG fund universe can be found in the text.

Annual growth rate			
	ESG Universe Growth	All Fund AUM	Difference
2014	47%	7%	40%
2015	19%	0%	18%
2016	22%	6%	16%
2017	37%	25%	12%
2018	6%	-9%	15%
2019	33%	20%	13%
2020	-11%	-13%	1%

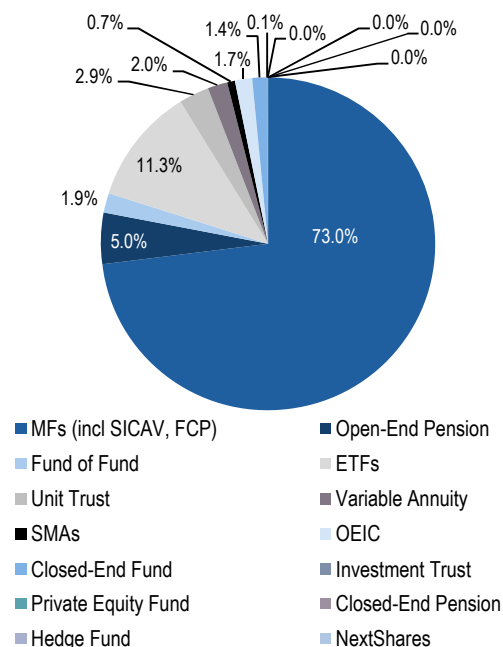
Source: Bloomberg, J.P. Morgan calculations

Therefore, with the caveat that it is too early to draw conclusions for 2020 and with the caveat that YTD market fluctuations might have distorted the picture in Table 1, it does not appear so far that the COVID-19 crisis benefited ESG adoption, at least in the retail space.

Our universe of 2500 ESG-related funds consists mostly of retail investor focused mutual funds as shown in Figure 1. However this Mutual Fund share has declined slightly over the past year from 74% in our previous publication a year ago to close to 73% currently. Figure 2 also shows the composition by asset class. It is not surprising that equities dominate the ESG fund universe given the lower traction of ESG factors into other asset classes, a message also conveyed by ESG surveys. But the share of equities has also declined to 63% from 65% since we last published a year ago. However, this decrease reflects mostly the correction in equity markets over the past year.

Figure 1: ESG fund universe by fund type

A detailed description of the ESG fund universe can be found in the text.



Source: Bloomberg, J.P. Morgan calculations

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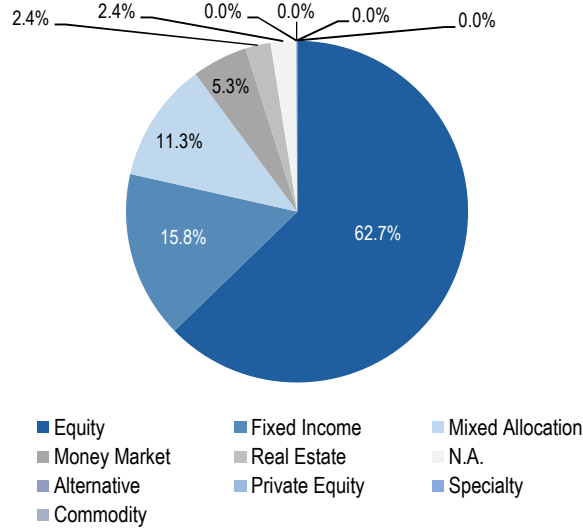
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J.P. Morgan Perspectives
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Figure 2: ESG fund universe by asset class

A detailed description of the ESG fund universe can be found in the text.



Source: Bloomberg, J.P. Morgan calculations

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ESG in Securitized Products lagging corporates and equities

- **ESG is set to gain further momentum and adoption across securitized product stakeholders through 2020.**
 - **Securitized products, thus far, are lagging corporates and equities, where there are various company/sovereign ESG ratings/scores provided by third-party providers.**
 - **Traditional credit rating agencies do not comment on ESG participation and/or effectiveness in securitized products, but are simply noting the relevance of ESG factor(s) in credit ratings.**
 - **Currently, with no standardization around ESG data/analysis and no third-party ESG scores, each investor has different areas of focus and approaches to vet investments against their own set of ESG criteria for securitized products.**
 - **We believe the securitized products community should develop a standard ESG dataset/framework, comprising of basic/common measurable ESG metrics that issuers can voluntarily report.**
-

We expect ESG securitization investing to gain more traction and adoption among the investor base in the year ahead. The topic saw increased discussion at industry conferences throughout 2019, with investors currently at different stages in their adoption of ESG (from already fully integrated in their structured finance investment strategies to only just starting to think of a framework). The Structured Finance Association (SFA) hosted the *ESG in Structured Finance Symposium* in December, which was well attended by rating agencies, bankers, issuers, investors, researchers and ESG index providers. Recognizing that securitized products is one of the last financial markets to adopt ESG scoring, and that significant strides in data availability, transparency, standardization and education is needed on the subject, industry participants urged SFA to take the lead and put out a basic primer on ESG.

ESG investing already here, worldwide

Though Environmental, Social and Governance (ESG) investing and Socially Responsible Investing (SRI) are not new concepts, these considerations have undoubtedly become an increasingly important focus for both issuers and investors across global financial markets through the post-crisis period. As ESG has become more integral to global investment mandates, conversations around the topic have emerged much more prominently since 2018 in particular—fueled in part by regulatory efforts and growing urgency around climate change—though the implementation of ESG investment strategies remains varied and continues to evolve.

As our colleagues in J.P. Morgan Research have pointed out in a series of flagship *J.P. Morgan Perspectives* publications on ESG Investing,¹ the market for ESG investment in Europe is more advanced than that in the US, with its development in the region aided by the European Commission's focused policy effort to combat climate change and encourage sustainable finance. Of note, the Commission published the details of its comprehensive "[European Green Deal](#)" plan in December 2019, which seeks "*to make Europe the first climate neutral continent by 2050*" via a binding Climate Law, in addition to many other proposed initiatives. Following this, in January 2020 the Commission subsequently released details on the European Green Deal Investment Plan, or the "Sustainable Europe Investment Plan", which would "*mobilise at least €1 trillion of sustainable investments over the next decade*" (for further details see [Financing the green transition: The European Green Deal Investment Plan and Just Transition Mechanism](#), European Commission, 14 January 2020).

Moreover, following the publication of the European Commission's [Action Plan](#) on Financing Sustainable Growth in March 2018, several measures outlined in the Plan have progressed toward or have been adopted into EU legislation; these include a standardized taxonomy for sustainable economic activities, the establishment of new "EU Climate Transition" and "EU Paris-aligned" (low carbon) benchmarks, and a new Disclosure Regulation for sustainable finance (set to apply from March 2021) that requires financial market participants and financial advisers to provide on their websites and in

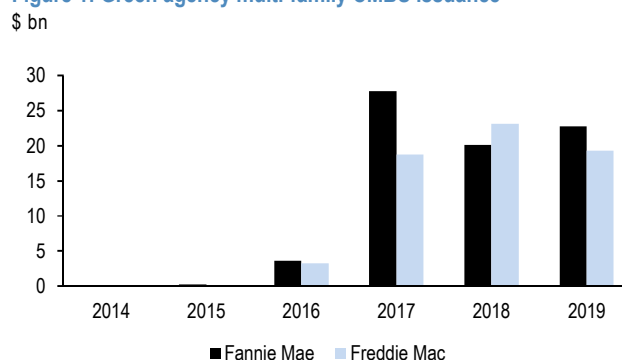
¹ See "[ESG Investing Goes Mainstream](#)", "[Climate Changes Everything](#)" and "[Climate Changes ESG Investing, Part II](#)", Chang et al.

pre-contractual disclosures how sustainability risks are integrated into their investment process/advice, and how these risks could likely impact returns. Finally, we note that in January 2019 the European Commission also published draft amendments to [MiFID II](#) and the [Insurance Distribution Directive](#) that would require investment firms and insurance intermediaries to incorporate ESG considerations and clients' ESG preferences into their investment advice and suitability determinations.

In Europe, secured funding markets (including ABS and covered bonds) have lagged both SSAs and corporates in terms of ESG issuance, though there has been a pickup in the supply of green, social, and sustainable covered bond issuance in 2018 and 2019, a trend which we expect will continue in 2020; following €6.5bn of such issuance in FY 2018 and €7.8bn in FY 2019, we estimate that the outstanding volume of publicly distributed, benchmark green, social, and sustainable covered bonds totals €17.3bn, led by Germany (33%), France (23%), Norway (20%), and Sweden (12%). By contrast, the European securitization market has seen relatively limited green bond issuance, with Dutch issuer Obvion placing four “green” prime RMBS transactions via its **Green Storm** platform since 2016.

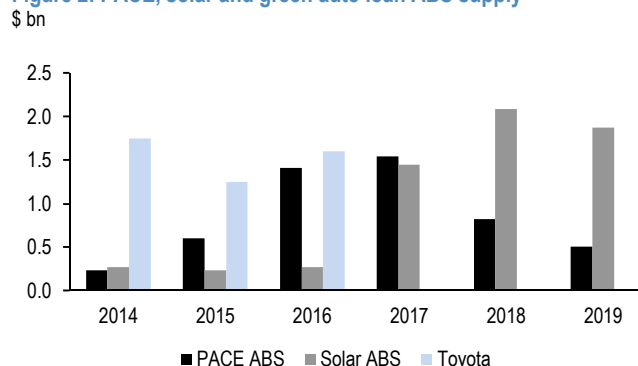
In the US, the size of these CMBS and ABS programs most directly associated with green is relatively small (Figure 1 and Figure 2). Agency multi-family CMBS has seen the most green bond issuance activity in recent years with \$42bn issued in 2019. On the ABS side, PACE and solar new issues totaled just \$2.4bn in 2019. PACE ABS are ultimately backed by municipal tax assessments levied on residential properties to finance renewable energy and energy efficiency projects. Solar ABS are collateralized by loans, leases, and/or power purchase agreements made to primarily residential borrowers. Toyota's green auto loan ABS programs issued \$4.6bn from 2014 to 2016. We note that PACE, solar, and Toyota auto green ABS bonds finance underlying assets that are green energy ('E' focused), but still none of those have published ESG scores available and investors would still need to apply their own ESG reviews.

Figure 1: Green agency multi-family CMBS issuance



Source: Freddie Mac, Fannie Mae

Figure 2: PACE, solar and green auto loan ABS supply



Source: J.P. Morgan, IFR, Bloomberg

Structured finance is lagging corporates in ESG scoring

The equity and corporate credit markets are far ahead of structured credit in terms of their focus on ESG. Several third-party ratings providers exist that evaluate and rate companies based on various ESG factors, including Sustainalytics, RepRisk, and MSCI. Typically, these ratings are derived using data collected from public reporting, the media, and direct discussions with the companies. Furthermore, indices have been created based on these third-party ESG ratings. The first such index was the Dow Jones Sustainability Index (DJSI), which was created back in 1999. The index represents the top 10% most sustainable market caps, based on their sustainability scores, as calculated by RobecoSAM. Other ESG indices constructed using alternative scoring systems also exist, and ETFs have been constructed to

track these indices. We note that J.P. Morgan Index Research has developed and maintains the J.P. Morgan Environmental, Social and Governance (JESG) index suite (see [JESG on Cloud Seven: Seven years of data busts the ESG underperformance myth](#), N. Bhat et al., 11 May 2020).

However, the existence of ESG ratings and ESG indices does not mean that all is well in corporate ESG investing. As our Credit Research analysts² have pointed out, more standardization around ratings methodologies and data reporting is needed. Regardless, a lot of this type of infrastructure that is available in corporate credit and equities for ESG investing is far beyond anything available for structured products. Naturally, rating agencies are attempting to fill in this void by crafting their own ESG guidelines and ratings, which we discuss in more detail below.

Rating agencies on ESG

Various rating agencies have expanded their ESG analysis to structured finance, having already covered sovereigns and corporates. Here, we summarize the approaches taken by the various rating agencies. Overall, **we note that the rating agencies are not checking for ESG compliance/participation, nor passing any judgement, but simply noting if ESG factors may possibly impact credit ratings.** This may evolve, however, with S&P noting that ESG evaluations could be revised based on revealed strengths or deficiencies in ESG factors (see [Chang, Harano, and Loeyes](#)).

Fitch, on October 15, 2019, published “Introducing ESG Relevance Scores for Structured Finance and Covered Bonds.” The approach adopted by Fitch merely determines the relevance of ESG to the bond/transactions’ credit rating, with the scale ranging from 1-5 (1 being the lowest relevance/irrelevant to the credit rating). It is important to note that the rating agency is *not* measuring ESG performance, evaluating merit or effectiveness of a transaction’s ESG or checking for companies’ ESG disclosure; it is simply providing an ESG relevance score to a given rating decision. Furthermore, Fitch does not use corporate ESG ratings/rank in order to determine securitized ESG relevance scores. Across securitized products, Fitch noted that ABS was least impacted by ESG factors, with only 2.5% of all transactions assigned an elevated score,

given the short tenure of transactions coupled with benign economic conditions. The bulk of the elevated scores were a result of Consumer Financial Protection Bureau (CFPB) litigation related to US student loans. See our original note [Evaluating ESG in Securitized Products](#) J. Sim et al., 24 January 2020 for two examples of Fitch ESG relevance for ABS and CRT.

In the CMBS space, elevated scores impacted 17% of all transactions, with 16% of transactions in North America assigned an elevated Social score, given the structural shift in consumer preference to online shopping. Moving to RMBS, 24% of all transactions globally have an elevated score assigned to at least one ESG factor. The key determinant of relevance in the RMBS space were social factors, which (negatively and positively) accounted for about 50% of elevated scores, followed by governance, which negatively accounted for 45% of the elevated Fitch ESG scores. Finally, looking across secured funding markets, we note that 19% of global covered bond programs were assigned an elevated score to at least one factor, with governance factors (Transaction and Collateral Structure) in peripheral Europe playing an outsized role in this market.

S&P released “ESG Credit Factors in Structured Finance” in September 2019. The rating agency clearly differentiates ESG from credit ratings, noting each of those are different types of opinions and utilize different analytical frameworks. ESG factors may or may not contribute or have a significant effect, positive or negative, on the transaction’s credit rating/analysis. S&P utilizes a five pillar approach when assessing credit on a structured finance transaction which includes 1) credit quality of securitized assets, 2) legal and regulatory risks, 3) payment structure and cash flow mechanics, 4) operational and administrative risks and 5) counterparty risk. If an ESG factor becomes material enough to influence the rating agency’s opinion of risk or benefit to any of the five pillars, that ESG factor may be relevant to the credit rating. However, S&P specified that in most cases ESG factors are not yet significant rating drivers. Moreover, even in scenarios where the ESG factors are directly relevant to credit quality, structural features such as increased support levels, deleveraging and amortization, concentration limits, shorter tenors, performance triggers etc., can offset the impact of ESG risks. Structured finance rating actions by S&P driven by ESG credit factors have so far been limited; however,

² [ESG Investing in Credit: Hangin' 'round the Hoop](#), S. Dulake, 6 December 2019

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the rating agency noted that its structured finance ratings are “susceptible to change due to major ESG event-driven risks.”

Moody’s in January 2019 had published “General Principles for Assessing Environmental, Social and Governance Risks,” detailing their approach to analyze ESG issues across all sectors. The general approach (which Moody’s uses in addition to any nuanced, sector-specific approach) to capture ESG considerations into corporate and sovereign ratings include assessing the potential and material impact of ESG across relevant metrics (such as profitability, cash flows, etc. for corporate issuers and economic strength, fiscal strength, etc. for sovereigns). Moody’s, as a part of its “Structured Finance – Global 2020 Outlook,” noted that ESG-conscious investors’ influence on structured finance markets will grow in 2020, but natural disasters’ impact on securitizations will remain minimal in the year ahead as a result of insurance coverage, representations and warranties, and servicer advances.

Kroll Bond Rating Agency (KBRA) published “Environmental, Social and Governance Risk by Sector” in August 2019, detailing its approach across corporates, structured finance, public finance, insurance and sovereigns. In general, the agency considers ESG factors into its credit analyses and consequently credit-relevant ESG factors are embedded in the rating methodologies. Specifically for structured finance, KBRA typically focuses on the impact of governance factors (e.g., the way assets are originated) and social factors (e.g., demographics and employment levels) on consumer behavior and asset performance, as well as environmental factors (e.g., climate change) on collateral value.

While credit rating analysis is the first and foremost function of a rating agency, we note that the parent companies do have significant other vested interests and separate business units in ESG. Morningstar, which acquired DBRS in May 2019, already owns a 40% stake in Sustainalytics, a leading provider of ESG research and rankings to investors, and it announced in April 2020 that it will acquire Sustainalytics and purchase the remaining shares. S&P Global announced in November 2019 that it will acquire the ESG ratings business from RobecoSAM, which includes the widely followed SAM Corporate Sustainability Assessment (CSA). Moody’s, in October 2019, had noted that it was set to acquire a minority stake in SynTao Green Finance, a China-based provider of ESG data and analytics.

Moody’s also acquired a majority stake in Four Twenty Seven, Inc., a leading provider of data, intelligence, and analysis related to physical climate risks, which was announced in July 2019. Rating agencies have also been leaders in indexing, with ESG indexing being the natural path of expansion. We note that all the ESG rating companies have established track records in scoring companies and sovereigns, but are not currently scoring securitized product transactions. For example, S&P launched the S&P 500 ESG Index in January 2019, which measures performance of equity securities meeting sustainability criteria and is based on industry weights of the S&P 500.

ESG applications in US securitized products

Naturally, with no standardization around ESG data/analysis and no third-party ESG scores, each investor has different areas of focus and approaches to vet investments against their own set of ESG criteria for securitized products. Just as investors do their own credit analysis and do not rely solely on rating agency credit ratings for investment decisions, we believe each investment shop would want to conduct its own ESG due diligence and assign its own ESG score. Resources (time and effort) could be a constraining factor here, though purchasing third-party ESG services would have its own cost as well. Additionally, we note that ESG scores/rankings, and scales, show wide divergence across third-party providers, even for the same company. Likewise, even on credit rating, where ‘AAA’ is relatively well defined and understood, rating methodologies differ across rating agencies. In the sections below, we provide examples of how different investors are currently using ESG criteria to analyze the main securitized product sectors.

In MBS, on the environment side, the impact of climate change is factored into CRT investing, as catastrophic risk is embedded in CRT deals. Natural disasters, such as hurricanes and earthquakes, increase the risk of defaults and/or loan modifications. This does not mean that CRT deals fail ESG criteria, but simply that it is an ESG risk factor that needs to be considered when rating CRT deals within an ESG framework. Certain investors are also looking at MBS through a more social lens. Securities that help finance first-time homebuyers and owner-occupied rather than investor or starter homes can score highly in ESG criteria. Responsibly sized loans for low credit score borrowers and lending to those in underserved communities also helps ESG scores. Lastly, avoiding predatory lending practices and excluding

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lenders who “churn” borrowers can also be part of investors’ ESG approaches.

Such a framework may be easily applied to other types of consumer lending beyond mortgages. For example, environmental impact and responsible/predatory lending are just as relevant to auto lending. For vehicle financing, green energy (electric/hybrid), fuel-efficiency, and environmental impact (e.g., US EPA’s smog rating noted in Toyota’s green auto ABS) are a few factors. Social could address the types of borrowers/communities served with affordability/access. On governance, OCC, FDIC, OTS, CFPB have extensive regulations on lending practices, compliance or non-compliance by lender provides at least a starting point. Providing plain English loan documents as well as budgeting planning, in consumer lending, for example, factor into ‘S’ and/or ‘G’ for some investors.

CMBS is one of the few securitized product sectors with a sector that is explicitly designed to score highly on investors’ ESG scorecards (at least the ‘E’).

Multifamily lending with an environmental focus (‘Green’ lending) has become a significant share of the Agency CMBS market, comprising about 28% of total new volumes or \$42bn across both Fannie and Freddie’s multifamily businesses in 2019. Fannie and Freddie achieve their green lending goals primarily by incentivizing borrowers to make improvements to their multifamily properties that increase water and energy usage efficiency. Borrowers can receive better pricing and higher loan proceeds based on water and energy usage efficiencies achieved. In addition, these improvements provide utility cost savings to borrowers and their tenants.

In addition to the environmental benefits, the green lending programs also have a social component. Incomes have been rising slower than home prices in many parts of the country. In recent years, this has made single family homes unaffordable for many, particularly for those living along the coasts. Green lending programs, such as these, help increase the supply of affordable multifamily housing that provides consumers with the option to rent in cases where buying a home is a stretch.

Standardized securitized products ESG framework needed

The absence of external vendors and rating agencies in providing ESG ratings for structured finance products has meant that investors have had to come up with their own ESG frameworks. Many of the more robust frameworks result in internal ESG ratings for different issuers and/or securities that can then be incorporated in investment decisions. In many cases, rating securities against these frameworks requires enhancements to due diligence and surveillance processes.

We believe the securitized products community in the US should develop a standard ESG dataset that issuers will voluntarily report.

This ESG data set would ask for specific and quantifiable metrics, broad and by asset class, on ‘E’, ‘S’ and ‘G’ factors from the ABS/MBS sponsor. An ESG framework for securitization is not an attempt to find conformity in ESG *opinions*, but to find a set of basic/common measurable ESG metrics. The parallel in equity investing is that companies report EPS, but the metric comes in many versions including adjusted or diluted, non-GAAP or unaudited. Furthermore, investors can still choose to use another alternative such as ROE and have completely different strategies, while public companies follow evolving financial accounting and reporting regulations. We note that for equity/corporates, ESG surveys conducted by ESG score providers are voluntary; even then, corporate participation has increased. Industry groups, such as the Structured Finance Association (SFA) and the Sustainability Accounting Standards Board (SASB)³, can help facilitate the dialogue between investors and sponsors.

The securitization sponsors and the investors would need to find the right balance of cost-effective and standard disclosures without compromising underlying borrower (e.g., consumer or corporate obligor) confidentiality. Of course, investors generally prefer as much raw data as they can get, but investors also need to consider the resources required to analyze all the data. Standardizing the raw data is key to ensure proper analysis and comparison, hence quantifiable ESG measures would be best. Investors working with issuers from the start to come up with a standard template, would ultimately save time and money for both sides. We

³ The Sustainability Accounting Standards Board (SASB) is a nonprofit founded in 2011 dedicated to developing reporting standards for sustainability, just as FASB (founded in 1973) has done for financial accounting. Current members of SASB’s Investor Advisory Group

include AXA, Bank of America, BlackRock, CalPERS, CalSTRS, Goldman Sachs Asset Management, Fidelity, PIMCO, State Street Global Advisors, TIAA, and Wells Fargo, UBS, among others.

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provide some example of quantitative ESG measures that could be included in a hypothetical form ABS-ESG (Table 1). Again, we note that there is no attempt to find common ground on how to judge positive/negative ESG impact, but simply to have a few standard metrics as a starting point for developing the framework for ESG analysis/comparison. We saw this in the development and implementation of form ABS-EE (auto loan tapes) with the industry (investors and issuers) working with the SEC for Reg ABS II. We think it would be in the interest of sponsors to voluntarily provide the ESG data as well, given that not only more and more investors around the globe, but also regulators (specifically, European regulators) are already asking for these metrics.

There is a nascent regulatory precedent for ESG reporting within the European securitization market following the implementation of the new Securitisation Regulation at the beginning of 2019. One of the many requirements for a transaction to be designated as ‘*Simple, Transparent, and Standardised*’ (STS)—effectively a “high quality” label for securitisations, and which receive preferential capital treatment within European bank and insurance company capital frameworks—is that, if the deal is backed by residential mortgages or auto loans or leases (i.e., RMBS or Auto ABS), then “*the originator and sponsor shall publish the available information related to the environmental performance of the assets financed by such residential loans or auto loans or leases.*” This reporting field will be a part of the enhanced data disclosure templates developed by ESMA and adopted by the European Commission in Q4 2019, which are set to apply later in 2020; however, we note that it remains unclear the extent to which such environmental performance data is available, and what form it will take. The Regulation also provides for a review of whether these environmental disclosure requirements “*need to be extended to securitisation where the underlying exposures are not residential loans or auto loans or leases, with the view to mainstreaming environmental, social and governance disclosure*” by 1 January 2022. That said, we recognize that this requirement captures only the ‘E’ aspect of ESG, and not ‘S’ or ‘G’ factors, and more progress is needed here.

Table 1: Hypothetical form ABS-ESG with a few examples of standard/quantitative ESG metrics

Environmental

- % of receivables that are green certified?
 - Certified by what organization?
 - Certified under what regulations?
- Distribution of assets in flood/fire/earthquake zones (zip code)?
 - % with insurance
- % paperless statement enrollment

Social

- % of receivables to low income borrowers or minority businesses?
- Distribution of assets in low income communities (zip code)
- Financial education/budget planning provided (Yes/No)?
- Plain English document provided (Yes/No)?
- Asset domiciled as related to sovereign ESG risk

Governance

- Number of legal settlement/lawsuits
 - \$ amount settlements/fines
 - \$ amount of legal reserves
 - Seller servicer corporate gender parity
 - SEC reporting - Data reporting and transparency (Yes/No)?
-

Source: J.P. Morgan

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Alternative Energy: Unanticipated ESG Safe Haven

- **COVID-19 mainly impacts supply, not demand.**
- **Solar glut possible, but it's investable.**
- **Best near-term ideas: FSLR and TPIC.**
- **Best ideas for the COVID-19 recovery: ENPH, SEDG, RUN and NOVA.**
- **Lean against fossils for the next 25 years.**

Demand seems resilient to COVID-19 for now

Manufacturing and supply-chain disruption, which started in February, continues to impact upstream production of solar panels, wind turbines and blades, but the COVID-19 pandemic is now impacting near-term sales, particularly in the small-scale solar rooftop end-market where social distancing impedes door-to-door marketing, system installations, and new home construction. Utility-scale deployments are less impacted, but some projects are slipping. Near-term demand, however, seems resilient owing to favorable unit economics, PTC and ITC tailwinds, and the inertia of in-process utility-scale projects started and funded in advance of COVID-19.

Renewables could be impacted, medium term

We see three issues over the medium term. 1) COVID-19 triggers sub-trend global GDP growth and weak demand for electricity, weighing on solar and wind new-build activity. 2) Capital or budget constraints, risk aversion, and the elimination of incentives and subsidies, could slow the transition to renewables. 3) Post COVID-19 priorities could shift away from decarbonization.

Solar glut possible, which is good and bad

LONGi and GCL have recently announced plans to expand solar PV capacity dramatically over the next 2-3 years, despite weakening 2020 demand. This threatens another solar glut, akin to 2009, 2013, and 2016-2017, which could weigh on panel OEM ASPs and margins for a few quarters, potentially shaking out some of the tier 2 panel suppliers. The impact on market caps of these gluts is attenuating over the course of time, because tier 1 OEMs are acting rationally to protect their balance sheets, and investors are looking through the glut to the onset of another quantum of price-elastic demand. Long-

cycle utility-scale projects, for which funds and OEM panel supplies are already locked in, are also unaffected.

Longer-term, renewables still win

Long-term global prospects for wind and solar deployment activity remains encouraging (see [Alternative Energy: Takeaways from EIA Annual Energy Outlook Report](#); P. Coster, 4 Feb. 2020) as over 80% of the \$13 trillion expected to be invested in generating capacity through 2050 will be allocated to zero-carbon resources, and 50% of the world's electricity will be clean and renewable by 2050; and CO₂ emissions should fall about one-third from 2020s peak levels.

Investment Idea: Utility-scale for now

Given our assumption that long lead-time utility-scale projects have momentum through into 2021, and are therefore somewhat resilient to COVID-19 disruptions, we favor those companies that are focused on these end-markets. **Our Top Long Ideas for 1H2020 are First Solar (FSLR) and TPI Composites (TPIC)**; see below.

Investment Idea: DG for COVID recovery

Rooftop solar sales activity is impacted in 1H20 as installers transition away from door-to-door sales towards digital strategies owing to COVID-19, but we believe underlying demand will be unaffected owing to the cost savings that accrue to middle-income homeowners, and growing interest in solar-plus-storage as an energy-resilient solution in regions where T&D infrastructure is unreliable (e.g., PG&E territory). We believe distributed generation (DG) will be quick to rebound with an end to social distancing, so **for the COVID-19 recovery phase our Top Long Ideas are Enphase (ENPH), SolarEdge (SEDG), Sunrun (RUN) and Sunnova (NOVA)**.

Investment Idea: Avoid Fossils!

We believe long-term investors should lean against fossil-based stocks, with a long-term perspective, seen through the lens of Alt Energy trends. Wind and solar now have the lowest cost of energy in the power sector in nearly two-thirds of the world (source: BNEF), and the falling cost of storage (particularly li-ion) should make renewables-plus-storage competitive with gas generation at utility-scale as a source of capacity within a decade. Electrification of home and C&I heating and electrification of transportation fleets expands the reach of the decarbonizing power sector. At the aggregate level, over the next 25 years, we believe fossil reserves, related infrastructure, and generators will be stranded

assets, and many equipment suppliers into the gas industry will see falling revenues.

First Solar (FSLR)

First Solar (FSLR) is a leading global supplier of solar panels and systems, differentiated from the broader commodity industry by its exclusive use of proprietary thin-film technology. The firm's massive investment in highly-automated manufacturing facilities positions the ramping Series 6 product to intersect with silicon-based panels (95% of the market) in terms of both cost/watt and energy-density, creating a sustainable competitive advantage in a large and growing market. First Solar's Series 6 product, destined for utility-scale deployments, is sold out through most of 2021 already, and the ongoing transition to next-generation production is driving up margins as capacity utilization increases. Near-term prospects were strengthened by the US decision to impose Section 201 tariffs on imported bi-facial solar modules, so we expect visibility to extend through 2021 soon. The firm is under-earning during the ramp phase, but earnings power should be fully expressed by the second half of 2020.

TPI Composites (TPIC)

TPI Composites (TPIC) is the only independent wind blade manufacturer with a global footprint. The company's advanced composite technology and production expertise provide a barrier to entry. TPIC has long-term contracts to supply blades to five of the top ten wind OEMs, and the top five excluding China-based OEMs. Long-term contracts include minimum volume obligations of \$2.8bn through 2023, or up to \$5.2bn if fully committed. The company has diverse manufacturing in North America, Europe, and Asia.

Wind projects have long lead-times and deployment cycles, so we believe TPIC is relatively better positioned than others under coverage near term, though some slippage seems inevitable given likely disruptions to supply. We believe TPIC's trough-level multiple seems to have priced in these risks.

Enphase Energy (ENPH/Strouse) and SolarEdge (SEDG/Strouse)

Enphase and SolarEdge are pure-play inverter companies, leveraged to unit-growth in solar panel shipments into the residential (ENPH and SEDG) and C&I market (SEDG). Every solar system needs an inverter, and rooftop solar is a sweet-spot of solar growth

(10X growth through 2040). The companies' technology is a unit-driven expression of the secular theme of decarbonization, but also of decentralization and digitization (synching solar and batteries with the grid).

Enphase and SolarEdge are solidly profitable companies, with industry-leading gross margins, positive cash-flow, and with net cash positions on the balance sheet. They are growth companies, but not capital-intensive, and although near-term revenue may be impacted by the aforementioned near-term sales approach transition for installers (away from door-to-door), we believe both companies are well positioned to ride out the downturn and should be quick to rebound owing to short sales-cycles for rooftop solar.

Sunnova (NOVA) and Sunrun (RUN/Strouse)

Sunnova, a 2019 IPO, has quickly emerged as a leading residential solar service company in North America with ~75,000 customers. Sunrun is the largest in the industry with ~285,000 customers. There are a total of 2.2 million solar rooftop owners and customers in North America, representing about 3% penetration of the addressable market; we look for penetration to double by 2024, and we expect Sunnova and Sunrun to participate in the implied 16% growth opportunity.

We believe near-term *installation* activity should be rather immune to impacts from COVID-19, though *sales* activity will likely be impacted, particularly door-to-door sales, causing a transition toward digital sales approaches. We believe both NOVA and RUN have financing in place to satisfy installations through FY20. Finally, we note that each company is trading at or below the total net value of assets previously deployed, which should provide support for the stocks, in our view.

We look for NOVA and RUN to continue to expand their service offerings beyond solar to include storage, and whole-home energy management solutions that include the EV.

We believe both companies are well positioned to ride out the downturn and should be quick to rebound owing to short sales-cycles for rooftop solar.

European Industrials: A smart and efficient building opportunity

- **Economics, regulation and corporate ESG to drive carbon reduction in buildings.**
- **Incremental opportunity for electrification, HVAC upgrades, intelligent building controls and smart grid.**

Drivers - still mostly about the money but that is changing

- A very large majority of the market-for-efficiency investments is still driven by **financial incentives** of the associated energy savings, particularly for owner/operators, with a focus on payback periods of the initially higher capex.
- The pressure from social media is growing for large firms, particularly consumer-facing ones. A growing number of **corporates have made carbon commitments** and now have to figure out a roadmap to deliver on the top-down plans. Corporates emit carbon in their production, supply chain, logistics and buildings. Buildings are often the easiest way to achieve a reduction in emissions with more control for the corporate while technologies are mostly already available.
- **Regulation:** Europe and a number of emerging markets including China are at the forefront here. Rules on minimum efficiencies phased in over time can result in stranded assets for real estate firms and provide pressure to upgrade old buildings. Long-term owners of buildings may look for “Paris Proof” buildings that are compliant with the path to 1.5c global warming versus pre-industrial times. The next few years are critical as countries need to implement the bottom-up regulation and initiatives to back up their overall climate commitments.
- **Capital:** The backdrop of very low interest rates and relatively visible savings from investment make efficiency-driven capex today attractive. Capital Markets recognizing the importance of ESG should also direct capital to firms and projects striving for lower carbon footprints. Future fiscal stimulus will likely have a strong climate change focus to justify already-high debt burdens for future generations.

How to improve a building's carbon footprint

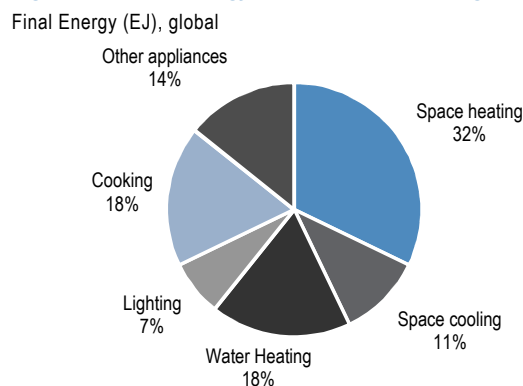
Principally, there are two ways to reduce a building's emissions. First, investments into the building to make it more energy efficient and smarter, thereby reducing energy needs. Second, fossil fuels can be replaced by other forms of energy, chiefly through electrification of processes historically powered by oil and gas. This only works if we assume that a growing share of electricity will be contributed by renewables.

We see the following as the main products and services that support a building's decarbonization:

- Replacement of traditional heating systems by heat pumps.
- Improvement in building construction and insulation materials used.
- Intelligent building controls to optimize energy use, sensing and data analysis of occupancy and use of building.
- High-efficiency HVAC systems and associated controls.
- Local energy generation, storage and demand management solutions.
- LED lighting and associated smart controls.
- Implementation of district heating systems.

Electricity today accounts for close to 40% of the energy used and this is forecast to rise to 60% by 2050, while the demand for fossil energy used directly in buildings falls. This requires an increasing share of electricity to be generated from renewables in the future, otherwise the electrification of buildings will have a more limited impact on global emissions. Overall, in terms of energy sourced, the share of oil and gas will decline.

Figure 1: Share of energy consumption in buildings



Source: IEA

Who will win?

Our conclusions are that:

- A large majority of buildings will likely continue to employ traditional methods where the various disciplines will remain separate and vendor choice happens late in the process in a relatively uncoordinated way. However, the changes discussed in terms of regulation and carbon initiatives will shift the market towards integrated solutions, particularly for larger buildings and where the owner is also the occupier. The market for building automation systems will likely become more fragmented, with new entrants offering systems that collect and analyze data and sit on top of the installed base of various systems. The entry barriers here are relatively low; however, the profit pool will also be limited. The profit pool will likely be more attractive for systems that can provide a closed loop with operations.
- **Global presence and local capabilities:** many of the customers embarking on initiatives to improve their building efficiency and carbon footprint are large global companies. These companies may want to choose vendors that can implement chosen solutions in multiple regions and countries. This is different from the traditional buildings market, which is regional.
- **Integration and solution capabilities:** Companies with a strong focus on product sales may benefit from the higher share of electrical content in buildings and potential mix uplift from connected products but miss out on the value created from system integration, which can then be followed by attractive service and maintenance contracts and build out of an actively managed installed base.
- **Full offering of the electrical and control core:** We believe that customers look at a building performance in an integrated way when it comes to the electrical core, and hence the benefit of a “one stop shop” approach is more relevant.
- **Capillar distribution and partner network:** While a direct sale is relevant to the large company opportunity discussed above, the nature of the building market means that the size of the average customer is small and serving them in a profitable way is impossible.

Table 1: Overview of relevant markets

Market	Core Low Voltage	Medium Voltage & Smart Grid	EV-chargers	Electricity Smart Meters	Lighting Control	Lighting Fixtures & Systems	BMS / BAS	BIM Software	HVAC Control	Building Solutions	Installation Products	Critical Power
Description	Breakers, other products with electrify flow	Switchgear, distribution grid control	Fast and regular	Automated Meters	For some this is part of LV	Luminaires & Systems	Building Management System (software and controllers)	Building Information Modeling	For some this is part of LV	Systems, installation, service	Cabinets, cable ties, wiring accs.	UPS, Cooling, DCIM
Size (\$bn)	40	40	7	3 *	Part of LV or LF	50	6	9	3	45	60	12**
Medium term growth	3-4%	2-3%	20-30%	5%	Low teens	0%	HSD	Low teens	MSD	MSD	LSD	5-6%
Leaders (alphabetical)	ABB Chint Eaton Legrand Schneider	ABB Eaton Schneider Siemens	ABB Siemens Market is very fragmented	Landis+Gyr Itron Hubbell	Acuity Legrand Schneider Signify	Acuity Hubbell Legrand Signify Zumtobel	Honeywell JCI Schneider Siemens	Autodesk Bentley Dassault Hexagon Nemetschek	Honeywell JCI Siemens Trane	Honeywell JCI Schneider Siemens	ABB Eaton Hubbell Lagrand nVent Schneider	ABB Eaton Schneider Vertiv

Source: Company data, JPMorgan estimates. Also see rest of report for analysis and sources. *ex China as not accessible to foreigners. **Market includes some LV and MV products. LSD = low single digits, MSD = mid-single digits, HSD = high single digits.

What is the upside to growth?

Overall, the upfront capex of an energy efficient building based on standard technology available today when compared to a traditional approach is around 10-20% higher. This relates to the equipment side of things and excludes measures on the building envelope like insulation.

Electrification of buildings

The broader trend to electrification in buildings is a positive backdrop for low voltage and medium voltage electrical companies given that more electrical appliances need to be connected to the system. The electrical content (breakers, wiring devices, etc.) can increase by around 10%, as per our estimates. If this

happens over a 10-20 year timeframe, it can add 0.5-1 points to growth.

Building Automation: scope and market expansion

Today, typically only large buildings have a Building Management System (BMS) installed. We see a \$6bn market with high single-digit growth in the traditional BMS market, but we could see additional growth from penetration in the lower end.

Integration of EV charging

We estimate an opportunity of around €250bn over the next decade for fast charging infrastructure. This includes charging points, associated installation and material costs and upgrades to the distribution grid infrastructure. We see a more limited opportunity for our companies from the home charging market.

HVAC opportunity

It is difficult to assess whether traditional HVAC companies focused on selling chillers will lose more (market share loss to new technologies, smaller systems) or win more (accelerated refurbishment cycle, opportunities to sell advanced control systems, benefit from adoption of new technologies) in the future.

Digital Twin and Building Information Modeling

We see this as a \$9bn market growing in the low teens. The market is very fragmented. So far BIM is, if at all, used in the design stage while the benefits of BIM in operations management are still largely untapped.

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European Utilities: Implications of ESG investing on valuation create a clear buying opportunity

- **Our proprietary model shows that the European Utilities should have seen a 26-33% P/E re-rating since end-2016, with 11% contributed by the lower cost of capital linked to lower bond yields and 15%-22% due to the positive impact of environmental investments on cost of capital, growth potential and margins.**
- **Electricity networks should contribute the lion's share of such re-rating, as our model justifies a 31-43% re-rating of this business due to ESG.**
- **Finally, we see a near-term buying opportunity of the entire sector, as we believe the average share price correction since the start of the COVID-19 crisis is overdone, when taking into account both ESG and cost of capital considerations.**

In the last three years, we have seen a significant multiple expansion in European Utilities before the meaningful de-rating associated with the COVID-19 outbreak. The P/E of the European utilities re-rated by 19% on an absolute basis, while the market de-rated by 10%, between the end of 2016 and 6 March 2020. Since then, we have seen a material de-rating in both utilities and the broader European market, due to the COVID-19 outbreak.

Our proprietary model shows that the European Utilities should have seen a 26-33% P/E re-rating since end-2016, with 11% contributed by the lower cost of capital linked to lower bond yields and 15%-22% due to the positive impact of environmental investments on cost of capital, growth potential and margins. Electricity networks should contribute the lion's share of such re-rating, as our model justifies a 31-43% re-rating of this business due to ESG. The recent correction has brought the sector's 12-month forward P/E in line with its end-16 level: we believe this is a clear buying opportunity.

Renewables: 20-25% P/E rerating due to the "E"

We believe that the incremental growth opportunity provided by renewable investments and the growing willingness of investors driven by ESG investment criteria to price in such incremental growth has resulted in a willingness to factor in longer-term growth

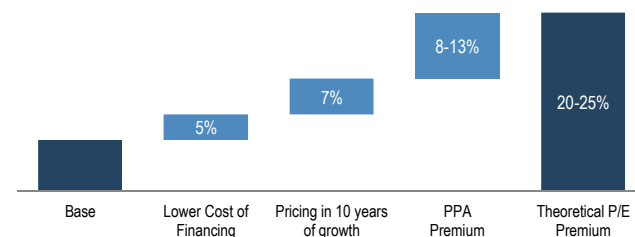
supported by the pipelines of renewable development activities. Our theoretical model shows that on average a shift from pricing in three years of growth to pricing in 10 years of growth would justify a 7% rerating in the P/E of the renewables businesses of European Utilities.

Not only is this growth stronger, but it is safer in our view. Renewables cash flows benefit now from being generated from operations that do not rely on subsidies and are competitive under market conditions. Besides, they increasingly benefit (particularly when we look beyond Europe and judge global portfolios) from the growing availability of stable revenue streams via PPAs and CFDs. PPA revenues according to our model should benefit from a c.11% premium P/E due to what we see as a 50bp lower WACC versus merchant businesses.

Ironically according to our model in addition they should also benefit from an additional 12% premium P/E given that they usually start from a lower earnings base. However, such earnings are stable through the life of the PPA. Meanwhile, renewable merchant earnings are usually higher in the early years, to decline in the out years. This means that altogether on our estimates a renewable PPA could trade at a 23% premium multiple versus a merchant renewable plant. We acknowledge that not all the new renewable capacity added by European Utilities enjoys the benefit from being PPA-protected, but we believe that even if we just assume such a benefit for 30-60% of the new capacity added, it would justify a 8-13% expansion in the renewables P/E multiple.

Finally, we estimate that the impact of green bonds and loans on the cost of debt as well as the assumption of a lower cost of equity linked to the incremental relative attraction of green investments has resulted in a 26bp reduction in the WACC for these businesses (20bp lower CoD pre-tax, 40bp lower CoE), which should be reflected in a 5% re-rating in their P/E ratio.

Figure 1: Justification of P/E Rerating of Renewables because of "E" Investments



Source: J.P. Morgan estimates.

Electricity Networks: The biggest beneficiaries

Networks are the enablers of the energy transition, and they have a growing exposure to green bonds.

Investments needed in electricity networks are likely to be very substantial (e.g., the Spanish Climate and Energy Plan estimates c. €60bn of network investments in 10 years, versus €92bn in renewables; and we would add that a portion of the €8bn of capex earmarked for the improvement in energy efficiency in the industrial sector will require the investment in substations and other network assets). Additionally, the need for investment has two indirect, but very relevant, positive implications:

- It results in an increase in the outlook for growth for these businesses without increasing their risk profile, as, contrary to renewables, there is no competitive risk in a natural monopoly business; and
- The need for delivery of incremental investments has a meaningful impact on the approach of the regulator when reviewing the allowed returns. Recent decisions, like the ruling on the 2020-25 allowed revenues for Spanish electricity distributors, illustrate how the regulator is under pressure to be more generous (even without changing the benchmark allowed return). In the end, this means the sustaining of flat or even bigger spreads over cost of capital versus a declining WACC.

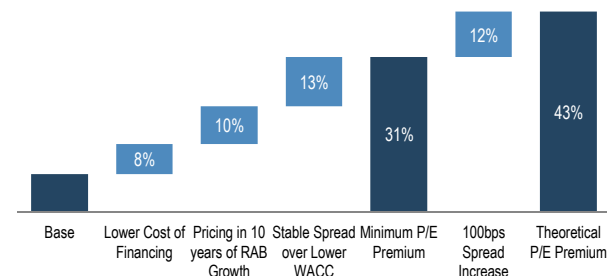
We believe that the capex to be deployed into electricity networks in the next 10 years should be 75-100% larger than the capex needed in a context of renewable capacity additions similar to the average of the last 10 years. We estimate that such a capex boost should result in a minimum 300bp increase on average in the growth rates of electricity network RABs in the next 10 years compared to what used to be seen as a steady state in the business. We estimate that a 300bp increase in the RAB growth rate in the current interest rate environment means a c. 10% increase in the P/E of the network businesses, compared to a business with a stable RAB.

The reduction in cost of capital in networks as their debt and equity is increasingly attractive to ESG investors is now very similar to that of renewables, and we quantify it at 26bp. We estimate that this lower cost of capital justifies an 8% re-rating in the P/E of network businesses.

Besides, the combination of a need for significant incremental investments in networks to enable the energy transition and a low interest rate environment creates a very favorable backdrop for the regulator to be generous. As a minimum, we struggle to see regulators cutting the allowed returns to utilities to an extent that it results in a reduction in the spread they make over their cost of capital. The keeping of a stable spread over cost of capital in a context of declining interest rates has justified in our view a 13% re-rating of the network businesses of the European utilities.

Moreover, what we are seeing across several geographies (e.g., Italy or Spain) is that selected regulators are opening up to the idea of providing incremental incentives to the network companies, including output-based incentives, to promote the digitizing of the networks and the minimizing of system costs (which are starting to feel significant upside pressure due to the challenges brought by a growing reliance on renewable energy sources). If we assume that the more generous approach to incentives and to other areas of the regulation yields a 50bp increase in the spread over cost of capital for the next 10 years (which we see as a minimum, as the focus on network investments should expand well beyond the delivery of the 2030 targets), then this would have an impact of 12% on the P/E multiple of an average European electricity network.

Figure 2: Justification of P/E Rerating of Networks because of "E" Investments



Source: J.P. Morgan estimates.

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European Insurance: Introducing an ‘ESG-Score’ and integrated valuation approach

- Insurance has an important social purpose to facilitate the atomization of risk.
- Insurance-specific ESG considerations are captured by the two sides of the balance sheet.
- Granular analysis of insurers’ ESG disclosure allows us to evaluate relative performance and derive an “ESG-Score” out of 20 by company.
- We introduced an integrated valuation approach, “ESG10/20,” which combines our fundamental analysis and ESG-Score to arrive at an adjusted valuation.

Sustainability in Insurance: Introducing ESG-Score and an integrated approach to valuation

ESG and sustainability are increasingly central strategic focuses for both investors and corporates. We consider the topic from the perspective of the insurance sector, which we note has a strong social purpose (derived from its role in spreading the cost of risk), but also with additional responsibilities that we consider to be more sector-specific. We see these as falling into two categories: 1) assets—investing in a sustainable manner; and 2) liabilities—underwriting responsibly.

Figure 1: ESG in the insurance sector

Considerations on both sides of the balance sheet



Source: J.P. Morgan estimates.

Our granular analysis of ESG disclosures

We outline a framework that allows us to assess relative strength from an ESG perspective in insurance, and through a granular analysis of company disclosures we have ranked the insurers that we cover in each of the E, S, and G categories.

We note that quality and depth of disclosure vary significantly, and so in some cases **lower scores may reflect lack of disclosure** rather than poor underlying ESG performance. From this analysis we have given our insurers an ESG Score out of 20.

Figure 2: How we have evaluated our companies’ ESG profiles
 Quality of disclosure varies significantly



Source: J.P. Morgan estimates.

Key observations from our analysis

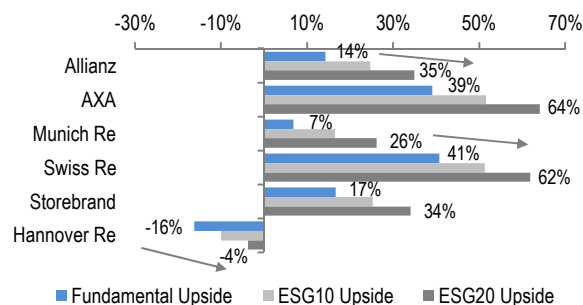
In general we find that there is a strong correlation between our ESG-Scores and company market cap, suggesting larger companies may have greater resources to dedicate to ESG and also have more accessible and complete disclosures. We also find that companies with higher ESG-Scores have produced higher 5-year total return, although interestingly we find no correlation between ESG-Scores and current P/E valuations.

An ESG-integrated approach to valuation

There is no widely accepted method of incorporating ESG factors into valuation, and we propose a method where our *ESG-Score* is used to adjust our fundamentally derived valuations. For a balanced view between ESG and fundamental analysis we propose an *ESG10* method, which assigns $\pm 10\%$ to our target price to reflect our *ESG-Score*. For a fully ESG-led approach, we show *ESG20*, where the adjustment is $\pm 20\%$.

The companies that screen best under our balanced ESG10 approach are: **AXA (OW)**, **Swiss Re (OW)**, **Aviva (N)**, **Allianz (OW)** and **NN (OW)**.

Figure 3: ESG 10/20 valuation



Source: J.P. Morgan estimates. Priced at COB 30 April 2020.

ESG in the insurance industry

Insurance is a sector that does serve an important social purpose. At its core, the insurance sector exists to atomize or mutualize risk.

In a P&C context, a simple example of the social benefit can be illustrated by the period following a major natural catastrophe, where the insurance industry collectively provides significant funds to an affected area such that rebuilding can happen quickly.

In a Life context, we also see insurance as a product with an important social purpose. Individuals can eliminate the risk that they outlive their retirement savings by benefiting from the law of large numbers (buying an annuity) or provide financial security to families with Life insurance products.

Responsibilities on both sides of the balance sheet

Investing assets sustainably: The insurance sector is one of the largest asset owners globally, we estimated that the European Insurance sector alone has investable assets of ~EUR4.6 trillion. Like any other asset owner, insurers are increasingly becoming aware of their responsibility to incorporate ESG factors into their investment methodology.

Underwriting risks responsibly: For P&C companies, insurers are increasingly aware that providing insurance to clients where sustainability may be in question may have implications for their own business, while in Life we believe there is a responsibility around the type of products created, and what information is used when pricing biometric risks.

Climate change and catastrophe risk: There is growing evidence that climate change may be causing both the frequency and severity of natural catastrophes to increase.

Measuring ESG profiles

Environmental factors

For environmental performance we assessed insurers against their investment and underwriting policies, such as screening/terminating investment in and terminating/limiting underwriting for controversial industries. Examples of best practice we observed are: Swiss Re's commitment to have 100% of its AUM ESG criteria benchmarked and Allianz to stop offering P&C insurance for single-site coal fired power plants and coal mines.

Social factors

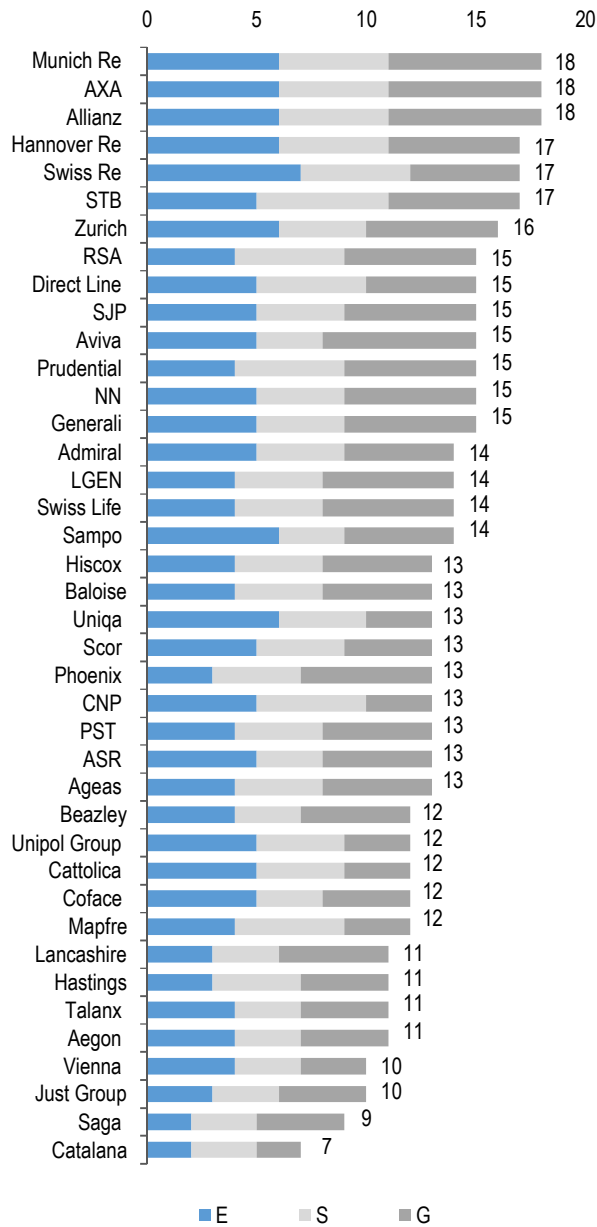
We consider insurers' role as employers, focusing on the inclusiveness, diversity and gender equality of the work force. We explored insurers' progress in technology and innovation by looking at what kind of innovative efforts they are putting in to improve customer experience as well as operation efficiency and whether there is any organizational structure support behind the progress. We also look at insurers' data privacy and cyber security framework and customer satisfaction and loyalty programs.

Governance factors

Considerations on governance include board structure and management remuneration. On remuneration, factors that we have considered include the size and structure of the remuneration package, including whether factors are included that align the interest of management with shareholders. We also looked at insurers' ownership structure, including free float and insider holdings.

Based on companies' disclosure on the abovementioned metrics and our understanding of their operations, we subjectively assign scores to each of the three pillars—Environmental (7), Social (6) and Governmental (7)—and add them up to obtain a final score for each insurer within our coverage universe.

Figure 4: European insurance ESG Score



Source: J.P. Morgan estimates.

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China autos, China coal-fired and wind power, and Asia oils: Introducing an ESG scoring evaluation system

- **Our China autos team developed an evaluation system to assess all OEMs' ESG scores using 11 criteria. Geely leads the pack, followed by BYD and Great Wall.**
- **The Chinese government will likely introduce tougher policies to curb CO2 emissions of coal-fired power plants, leading to higher operating costs and capex in the future.**
- **Our deep-dive into the China wind operators indicates that renewables have higher dispatch priority and thus are relatively defensive against COVID-19 headwinds.**
- **For our Asia energy coverage, selected companies (with OW/N ratings) which show an improvement in ESG focus are LG Chem, Woodside, TOP, GAIL, SPC and COSL.**

China Autos: 11 criteria assessing OEMs' ESG scores

In the March [China Auto Industry report](#), the Asia Auto team led by Nick Lai developed an evaluation system to assess all OEMs' (Original Equipment Manufacturers) ESG scores using the following 11 criteria. Chinese OEMs, led by Geely, followed by BYD and Great Wall, ranked in the top three and scored higher than foreign JVs.

Environmental

Electrification is clearly transforming the auto industry through reduction of greenhouse gases and vehicle-related CO2/NOx emissions as well as less dependence on fossil fuels. We apply three screening criteria in our Environmental analysis:

1. **Ability to meet China's emission targets—namely, CAFC:** We base our analysis on the latest announced 2018 CAFC (Corporate Average Fuel Consumption) credit status by the government and compare CAFC credits generated by each OEM against total vehicle production in 2018. In other words, we can differentiate between OEMs that exceed credit targets and those that simply tick the box. OEMs that fail to

meet the 2018 CAFC credit target are assigned zero points (i.e., Dongfeng Motor and Guangzhou Auto) while OEMs meaningfully exceeding the target receive 5 points (BYD and NIO).

2. **Ability to manufacture eco-friendly vehicles:** We examine OEMs' NEV (New Energy Vehicle) credit status by comparing NEV credits generated with NEV credits required. We assign 5 points to those meaningfully exceeding required NEV credits (BYD and NIO) but zero to those who fail (Dongfeng Motor and Guangzhou Auto). OEMs meeting the target are assigned 1 to 4 points depending on the magnitude of their credit surplus.
3. **Investment/innovation in green initiatives:** We evaluate the company's efforts on green initiatives by looking at its R&D and investment plans in NEV, as well as green factory and production process. A score is assigned based on our judgment and interviews with respective managements.

Social

We define a company's social responsibility and obligation in this analysis as its relations with key stakeholders including (but not limited to) customers, shareholders, and employees. To this aim, we screen and examine the following five criteria and find Geely and Great Wall scoring the highest, with NIO and BYD at the bottom.

1. **Customer satisfaction:** Simply put, we try to assess whether the buyer is happy with the product. We evaluate this by comparing the total number of complaints received by the CCA (China Customer Association) for each OEM with the number of vehicles sold by the same carmaker in 2018. The higher the ratio, the lower the customer satisfaction. We find that Great Wall ranks at the top but NIO and BYD at the bottom.
2. **Product risk and control:** We examine the level of production recall or so-called yield rate by comparing the total number of recalls for each OEMs with the total number of cars sold in the same period. In China, OEMs are required to file the recall data, which is publicly available information at the State Administration for Market Regulation (SAMR). Great Wall and Geely again rank at the top while NIO, BYD, and to some extent Brilliance China (due to Brilliance's own-brand business) score poorly.
3. **Return to shareholders:** We believe this criteria is straightforward—we look at each company's

dividend payout and ROE in the past three years. Geely and SAIC fare better than peers.

4. Capital management: Evaluation of capital management can come in various forms. We focus on the company's consideration for minority shareholders and the level of equity dilution (if any, through equity raising) in the past 10 years (excluding stock splits). We find that most OEMs deliver fair performance except for NIO and BAIC due to their equity-raising in recent years.

5. Employee satisfaction: We assess this by looking at top employers voted by their employees—an annual survey by top headhunting firm Zhaoping.com in China. The latest (2018) result of the top 100 employers was available. Among listed OEMs, Brilliance and BAIC were voted among the top 30 employers in China (we assign them 5 points in this analysis) and several are among the top 100 (we assign them 3 points—Geely, Guangzhou Auto, SAIC, and Chongqing Changan Auto).

Governance

Governance measures a company's internal and external controls as well as alignment with public or stakeholder interest. Corporate governance is becoming an integral part of the investment process.

1. Internal control and ESG transparency: We base this assessment on the ESG disclosure score assigned by Bloomberg. Of note, the ranking here is based on the amount of ESG information reported and disclosed by the company rather than the company's actual ESG performance. Among listed OEMs, Dongfeng Motor and Geely deliver higher scores while NIO has few disclosures, likely due to its limited listing history.

2. Internal interest alignment: We aim to assess whether the company can bring its employee and management interests in line with its long-term (financial) performance through incentive schemes such as stock option programs. We find that most listed companies, except for Brilliance and BAIC, offer equity incentive plans for the management team as well as employees.

3. Corporate image management: We evaluate a company's public reputation or image by the number of major lawsuits in which the company is a defendant. We find most companies have had few legal disputes, except for NIO.

Table 1: Ranking of all OEMs by E, S, and G scores

Rank	Environment (E)	Social (S)	Governance (G)
1	Byd Co Ltd-H	Great Wall Mot-H	Geely Automobile
2	Nio Inc - Adr	Geely Automobile	Byd Co Ltd-H
3	Geely Automobile	Guangzhou Auto-H	Great Wall Mot-H
4	Baic Motor-H	Saic Motor-A	Guangzhou Auto-H
5	Brilliance China	Chongqing Chan-B	Dongfeng Motor-H
6	Great Wall Mot-H	Brilliance China	Saic Motor-A
7	Chongqing Chan-B	Dongfeng Motor-H	Chongqing Chan-B
8	Saic Motor-A	Baic Motor-H	Baic Motor-H
9	Guangzhou Auto-H	Byd Co Ltd-H	Brilliance China
10	Dongfeng Motor-H	Nio Inc - Adr	Nio Inc - Adr

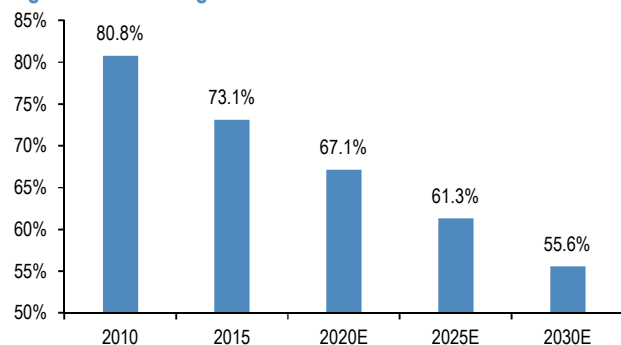
Source: J.P. Morgan

China Power Utilities: Five key trends into 2025

In March, the Asia Utilities, Environmental and Renewables team published [China Power Utilities: Challenges abound. Turning point not here yet](#), a deep-dive report where we highlighted five key themes for the China power market over the next five years. We also identified key beneficiaries and losers from these trends.

From now till 2025, the five key trends are: 1) The Chinese government will likely introduce tougher policies to curb CO2 emissions of coal-fired power plants; 2) There will likely be further fund outflows from the coal industry amid the proliferation of ESG investing mandates; 3) Capacity of coal-fired power plants is likely to grow at low-single-digits, while power generation in 2021-2025 should moderate to 3% from 6% in 2016-2020; 4) Efforts on power market reform will deepen in China, leading to increasing differentiation among generation units, while inefficient plants will suffer; and 5) Supply-side reform will accelerate in China for coal-fired power plants, whereby the government will force the shutdown of old and inefficient coal-fired power plants that do not meet emission standards.

Figure 1: Coal-fired generation as % of total in China



Source: China Electricity Council, J.P. Morgan estimates

Key beneficiaries from these trends are: Renewable companies. Note that the government continues to promote renewable power and aims to increase its share in the total power mix with ambitious targets in the government's work plan. We expect the capacity and power generation growth of renewables to continue to outpace that of coal-fired power, which bodes well for the former's earnings growth. Within renewable power operators, our top pick is Longyuan on the back of its attractive valuation (0.5x P/B), improving project mix, and a possibility of being privatized.

Apart from renewable companies, coal-fired power companies with clean and efficient generating units also stand out. This comes as the government is undertaking systematic sector reforms to introduce competition to lower power prices and optimize system costs, with an aim to liberalize the wholesale and retail electricity market. These measures will lead to differentiation in performance between power generators, as efficient and large coal generators will find it easier to gain their market share and result in higher utilization hours. Hence, companies with larger power generating units are likely to benefit the most. Within our covered coal-fired companies, China Resources Power (836.HK) has the highest ROE of 10% and average capacity of coal-fired power generating units of 1,100MW, which is likely to stand out amid ongoing power market reforms.

Conversely, traditionally coal-fired power companies, like Datang Power (991.HK), are likely to continue to lose market share and face the risk of de-rating. Also, it is worth highlighting that they are vulnerable to the Chinese government's continued efforts to de-carbonize as part of its commitments to the Paris Agreement. Note that the government is likely to roll out a nationwide carbon trading market to limit emissions from polluting industries, including coal-fired IPPs and other sectors.

Hence, coal-fired power plants with inferior emission standards will likely be required to purchase emission quotas, which could increase their ongoing operating expenses, which is negative for their valuations in the long term.

Lastly, we believe ESG investing will play a predominant role in impacting sector dynamics. Note that ESG investing is gathering pace in Asia, and numerous investors are adopting exclusion and negative screening, leading to the risk of fund outflows for controversial sectors including coal-fired companies. Hence, we believe more asset managers may consider exiting their investments in those companies unless they show efforts to transition themselves towards green energy. This could dent valuation multiples of coal-fired IPPs and benefit renewables, in our view.

China wind farm operators

On April 3rd, the Asia Utilities, Environmental and Renewables team published a deep-dive report on [China wind/solar farm operators](#). We think wind farm operators have higher dispatch priority and thus are relatively defensive against COVID-19 headwinds. In addition, new projects in 2021 will rank more highly for subsidy collections, and 2022 projects will be at parity (earning a reasonable return with no subsidy delay issues)—a re-rating driver. We think it is time to re-visit. Longyuan is our top pick.

Central Government has mandated that renewables (i.e., wind and solar) power should have higher dispatch priority than other fuel types. However, investors remain concerned whether weak power demand will weigh on renewable power dispatch. We think the situation for 2M20 has shown that dispatch priority is being followed. During 2M20, power demand declined by 7.8% yoy. However, generation by wind and solar grew by 1%/12%. It is possible that curtailments may have worsened slightly in February as local grids may have had physical challenges dispatching renewable power in low demand situations. The key message is that where physically possible, the local grid is trying to give renewables priority. Assuming power demand normalizes to positive growth territory for the rest of the year, we think that renewable power will continue to enjoy such dispatch priority, countering any cyclical headwinds from the virus.

With the Renewable Subsidy Fund running on deficit in the near term, we think that all legacy projects (projects

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which commence operation until 2020) will continue experiencing delays in subsidy collection. However, the situation will be different for projects commencing operation in 2021 and beyond.

2021 project: In order to promote wind/solar development with the least amount of subsidy burden, the government introduced an auction system for 2019 and 2020 new approvals. Both wind and solar farm builders need to submit a bid to the Central Government. The Central Government will rank all bids and approve the lowest bid until the allocated budget is used up. In order to incentivize project bidders to submit the lowest possible bid, these auction projects are promised as having priority for subsidy allocation. For wind power, the auction projects will commence operation in 2021. For solar power, some auction projects already commenced operation in 2019.

2022 and beyond: We expect the majority of wind farms built in 2022 to reach grid-parity status, meaning projects can achieve reasonable returns without relying on subsidies.

In addition, even without new policies to increase revenue sources (bearish scenario), we expect the annual deficit of the Renewable Fund to narrow by 22/23, following grid-parity development.

Asia Oil: Relationship between ESG and shareholder returns still intact

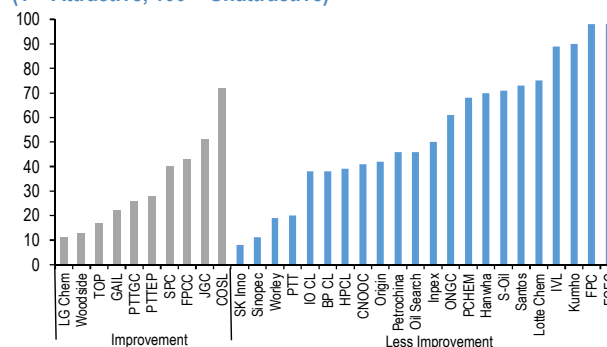
In the May [Asia Energizer report](#) by Scott Darling et al. from the Asia Oils team, our 2020 outlook suggested an accelerated shift in ESG focus for the Asian energy sector. We expected a shift change in the sector where performance will gradually start to reflect a focus on companies that are able to maintain returns and robust free cash flow (FCF) and dividend yield outlook while delivering low carbon intensity growth and more social/governance initiatives. While some may think ESG would take a back seat for Asian energy companies coping with the collapse of energy prices and demand due to COVID-19, our updated ESG analysis shows for some companies there has been a significant improvement in ESG ratings. While some of the ESG changes may partly relate to better year-end disclosure/reporting, there is also evidence of better ESG initiatives. For our Asia energy coverage, selected companies (with OW/N ratings) that show an improvement are LG Chem, Woodside, TOP, GAIL,

SPC and COSL while companies (where we have UW ratings) that have lower ESG scores relative to our last analysis in January this year are FCFC, S-Oil and Lotte Chem.

Names that have improved ESG rating: Within our coverage, companies that have seen an improving ESG score through reporting and various initiatives are LG Chem, Woodside, JGC, GAIL, FPCC, COSL, Thai Oil, PTTGC and PTTEP.

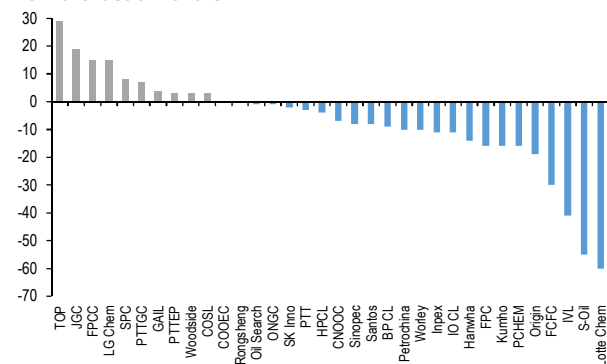
Correlation between better ESG and good shareholder returns: Our analysis still shows there is a broad relationship between Asia energy companies that offer above sector average FCF and dividend yield and an attractive ESG score (based on J.P. Morgan's methodology). Our OW/Ns that fall into this category are LG Chem, SPC, GAIL, COSL, Thai Oil and Woodside.

Figure 2: ESGQ ranking for most of Asia energy coverage (1 = Attractive, 100 = Unattractive)



Source: J.P. Morgan estimates. Chart shows ESG score as at 20 April 2020

Figure 3: ESGQ changes for most of our Asia energy coverage from the last 3 months



Source: J.P. Morgan. Chart shows ESG score change from our Asia Energizer report dated 14 January 2020 relative to 20 April 2020, for example, Sinopec's ESG score has changed from 4 to 11

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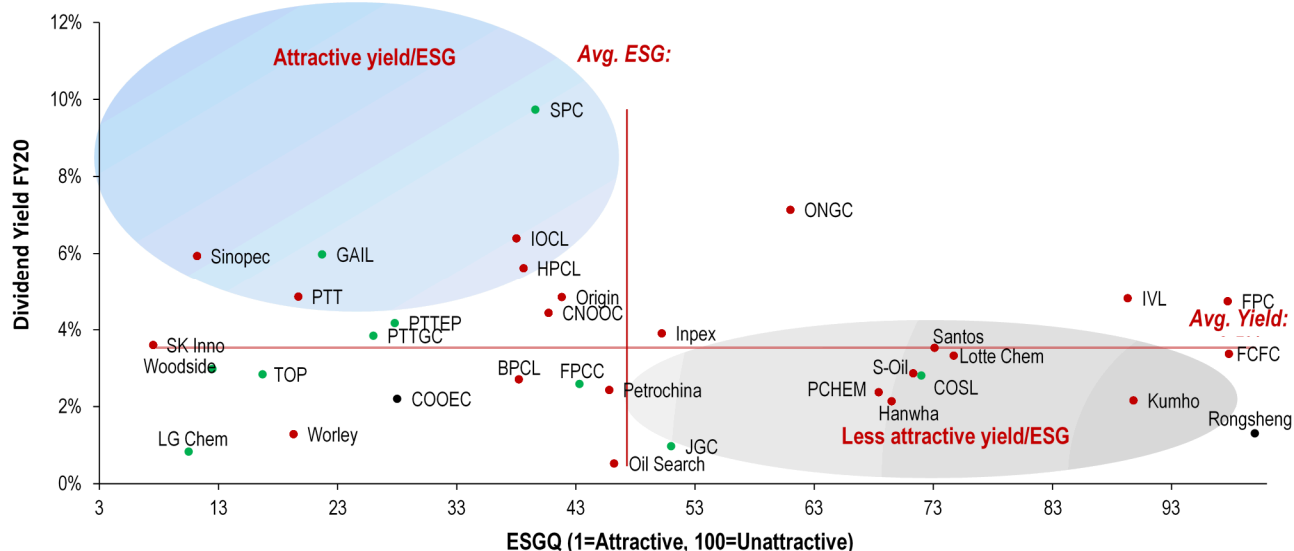
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Figure 4: Dividend yields have a relationship with stocks' ESGQ scores



Source: J.P. Morgan estimates. *In terms of ESG, green dotted stocks are improving and red dotted stocks have less improvement since Jan 2020.

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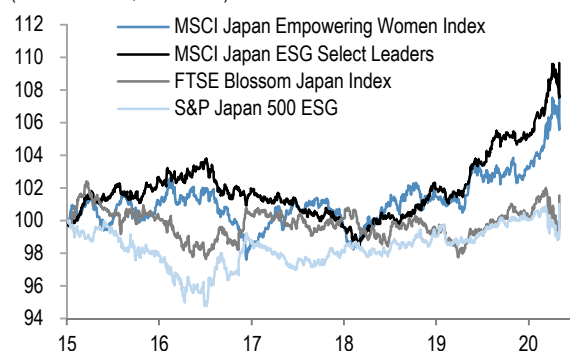
Japanese equity market set to enter a period of full-scale ESG investment

- **ESG investment poised to go full scale in the Japanese equity market.**
- **Japan has considerable scope for growth in sustainable investment.**
- **Japan's ESG scores have a major size bias.**
- **ROE+ESG looks like an effective investment strategy.**

ESG investment poised to go full scale in the Japanese equity market

We expect 2020 to be the year when the Japanese equity market enters a period of full-scale proliferation of investment driven by the ESG theme. In Japan, investment management companies began setting up ESG-focused divisions from around the time the Government Pension Investment Fund (GPIF) began investing in environmental, social, and government-related indices in 2017, and the number of ESG-related investment funds started to grow. In 2019 major ESG-related indices encompassing Japanese equities notably outperformed the broader market, bringing the ESG theme into sharper focus. As for the stewardship code revisions scheduled for 2020, ESG-focused items are expected to be included, which is likely to further accelerate ESG investment.

Figure 1: Performance of ESG-related ETFs in Japan
 (2015/1/1=100, vs TOPIX)



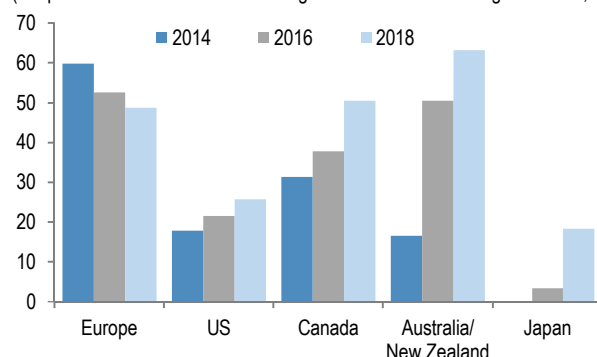
Source: Bloomberg, J.P. Morgan

Japan has considerable scope for growth in sustainable investment

According to a survey by The Investment Trusts Association, Japan, as of end-November 2018 the country had 2,034 funds with ESG requirements holding net assets of more than ¥38 trillion. Moreover, according to a survey by the Japan Sustainable Investment Forum, sustainable investment that considers factors such as ESG totaled ¥336 trillion in 2019, with Japanese equities accounting for ¥128 trillion. The balance of sustainable investment in Japan has risen sharply in recent years, but the scope for further growth looks substantial as the level remains low compared with other countries.

Figure 2: Global comparison of sustainable investing as % of total AUM

(Proportion of sustainable investing relative to total managed assets, %)



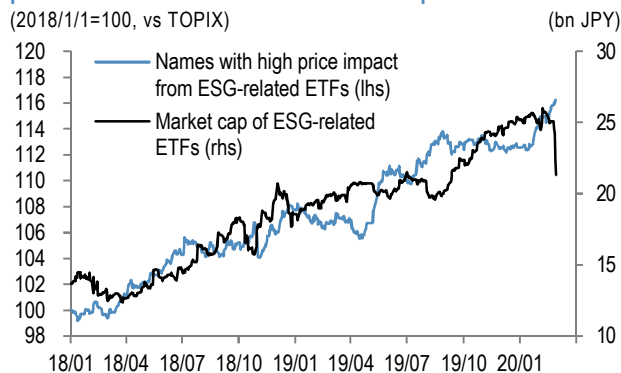
Source: GSIA J.P. Morgan

Japanese equity market poised for a period when ESG scores will tend to be effective from a supply-demand perspective

If upcoming revisions to the stewardship code trigger a proliferation of ESG-centric investing in the Japanese equity market, we think ESG scores will likely show a stronger direct impact (supply-demand impact from ESG scores). The Japanese stock market still has major scope for growth in sustainable investment. Likewise, we see major scope for capital inflows into ESG-related ETFs.

When ESG scores display a supply-demand impact, we think the likelihood of a share price impact will increase for stocks that are included in leading ESG funds and account for a high weight of trading value within those funds. Indeed, if we create a basket of such stocks and look at TOPIX-relative performance, we can confirm that they outperform in step with the growth in market cap of ESG-related ETFs.

Figure 3: Performance of stocks with high passive impact from purchase of ESG-related ETFs and market cap of ESG-related ETFs
 (2018/1/1=100, vs TOPIX)



Note: ESG-related ETFs are MSCI Japan Empowering Women Index, MSCI Japan ESG Select Leaders, and FTSE Blossom Japan Index. The basket was constructed by including stocks whose weighting is high when compared to trading volume. Source: Bloomberg, DataStream, J.P. Morgan

Japan's ESG scores have a major size bias

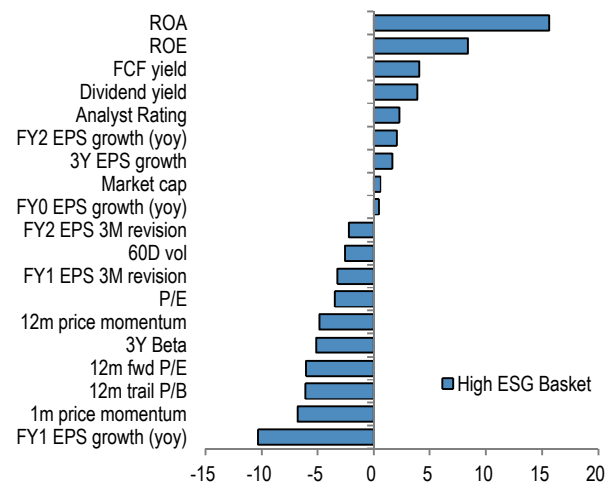
Subsequent review of Japan's ESG scores shows that ESG investment in Japan is not yet mature, which suggests that the ESG efforts by each company are not adequately reflected in their share price. In Japan there is a notable bias in terms of size, with high-ESG stocks dominated by large caps and low-ESG stocks consisting mainly of small/mid-caps. If ESG scores correctly reflect corporate value based on non-financial information, we think it would be natural for high-ESG companies to be high-quality companies. In our view, conditions like those in Japan—no clear relationship between ESG scores and quality combined with the apparent size bias—suggest that corporate ESG-related disclosures are generally not thorough enough, inevitably resulting in high ESG scores for large companies that are robust on information disclosure.

ROE+ESG looks like an effective investment strategy

Assuming that Japan's current ESG scores do not adequately reflect actual ESG efforts, we think there is a potential for higher returns by combining ESG scores with other factors. When we looked for effective factors within this high-ESG basket, we found the quality factors of ROE and ROA and the growth factor of EPS growth rate to be effective. A review of the performance of stocks selected based on a combination of ESG score and ROE showed that performance greatly exceeded those based on ESG score or ROE alone. Even the ESG score does not appear to be enough to lift performance, if confidence is not also reflected in corporate earnings and quality. Conversely, even if current ROE and earnings

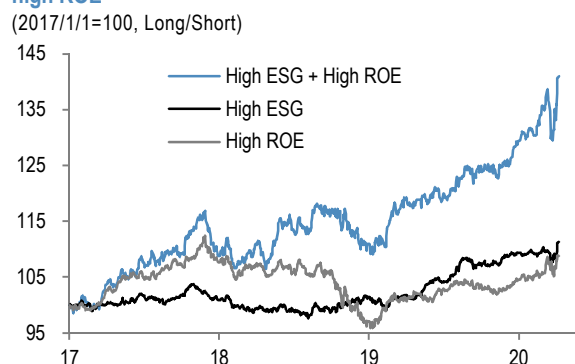
growth are high, it seems reasonable for a low ESG stock to reflect doubt about stability and sustainability. From this perspective we screened for stocks with both high ROE and high ESG scores.

Figure 4: Average factor returns within MSCI Japan top ESG quintile
 (annualized returns, %)



Note: Created a quintile profile using ESGQ scores for MSCI Japan universe. Calculated the factors effective in the first quintile (High ESG) universe. Data since 2017. Source: Bloomberg, J.P. Morgan

Figure 5: Performance of stocks based on high ESG score and high ROE
 (2017/1/1=100, Long/Short)



Note: Universe is MSCI Japan. Created a quartile portfolio based on ESGQ score and ROE. Calculated the return spread between the first and the fourth quintile. For High ESG + High ROE basket, we have chosen stocks that are in the first (High ESG and high ROE) and fourth (Low ESG and low ROE) quartiles in both portfolios and calculated the return spread. Source: DataStream, FactSet, J.P. Morgan

Please see [Japan Equity Strategy: Japanese Equity Market Set to Enter a Period of Full-Scale ESG Investment](#), R. Sakagami and K. Ueda, 4 March 2020 for further details.

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Japan Machinery: A smart and efficient building opportunity

- **Buildings account for 39% of global CO₂ emissions, and air conditioners (AC) are the largest and most wasteful consumer of energy in a building in countries with hot climates.**
- **Electrification is a path to reduce emissions as are upgraded HVAC systems, intelligent controls, LED/connected lighting, and replacement of gas heating. Integration of EV-charging and demand management systems also drive demand.**
- **We recommend Daikin Industries (6367, OW) as our Top Idea.**

Global Machinery sector focuses on smart and efficient building opportunity

Buildings account for 39% of global CO₂ emissions. Technologies to reduce this are available today and regulation is increasingly supportive. For companies pledging to become carbon-neutral, buildings are a more straightforward way to make progress than other parts of their value chain. Carbon-neutral buildings require higher upfront capex in return for lower operating costs. Electrification is a path to reduce emissions as are upgraded HVAC systems, intelligent controls, LED/connected lighting, and replacement of gas heating. Integration of EV-charging and demand management systems also drive demand. We recommend Daikin Industries (6367, OW) as our Top Idea.

We see the following as the main products and services that support a building's de-carbonization:

- Replacement of traditional heating systems with heat pumps.
- Improvement in building construction and insulation materials used.
- Intelligent building controls to optimize energy use, sensing and data analysis of occupancy and use of building.
- High efficiency HVAC systems and associated controls.
- Local energy generation, storage and demand management solutions.

- LED lighting and associated smart controls.
- Implementation of district heating systems.

Daikin (6367): Buying “added value of air”

Air conditioners (AC) are the largest and most wasteful consumer of energy in a building in countries with hot climates. There are around 1.6bn ACs installed, and the IEA expects a further 1bn to be installed over the coming 10 years.¹ About 2/3 of them are in residential buildings. This results in a significant challenge given the global ambition to reduce emissions. Air conditioning is also contributing to an increase in ozone and micro particles. The IEA estimates that 12% of global CO₂ relates to air conditioning. AC also uses F gases like hydrofluorocarbons (HFCs) as refrigerants. If this leaks, as it often does, they result in an impact on global warming of 1,000 and 9,000 times the impact of CO₂ per gram. In this context, we believe Daikin is well positioned as a global leading HVAC maker. What is clear to us is that companies focused on control and BMS and companies focusing on highly efficient HVAC technologies like Daikin will be the winners.

The world's No. 1 AC manufacturer, Daikin acquired major US air-conditioner company Goodman in 2012 and has pursued a strategy of capturing demand growth in the US, mainly for ductless AC. The rollout of highly energy-efficient models has been a success in Japan and overseas, especially in Asia. In China, Daikin has achieved major growth in highly profitable residential multi-split VRV systems by targeting the affluent. In terms of profit, the company is quite thorough on cost management versus increases in raw material costs. Despite lower expectations for short-term earnings due to the impact of COVID-19, we expect earnings to accelerate again from FY2021, as the added value of environmental and space considerations is increasing dramatically due to the UN's SDGs.

¹ International Energy Agency (2018): The Future of Cooling
<https://www.iea.org/futureofcooling/>.

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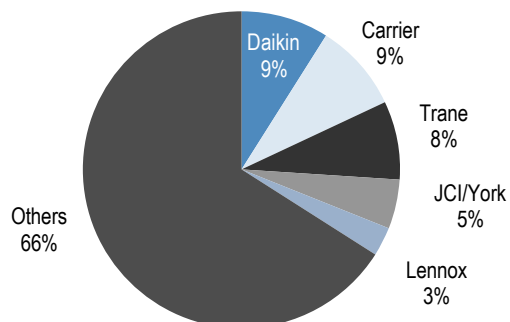
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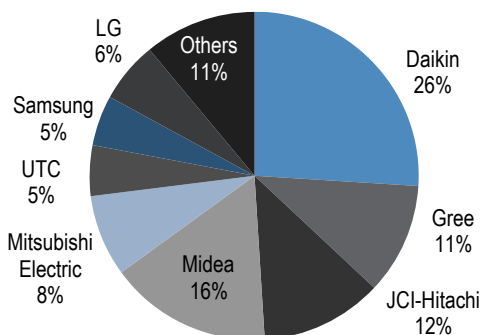
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Figure 1: Global HVAC Market Share (2018)



Source: J.P. Morgan estimates

Figure 2: Global HVAC Market Share for Ductless type (2018)



Source: J.P. Morgan estimates

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Appendix

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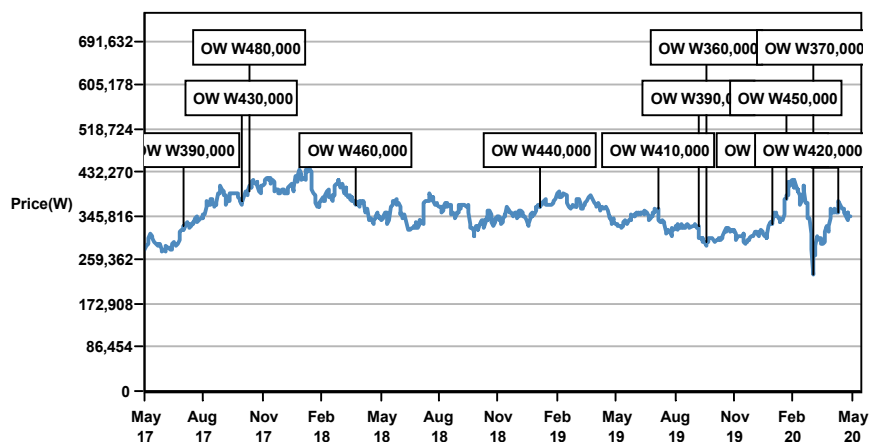
Daikin Industries (6367) (6367.T, 6367 JT) Price Chart



Source: Bloomberg and J.P. Morgan; price data adjusted for stock splits and dividends.
 Initiated coverage Aug 10, 2005. All share prices are as of market close on the previous business day.

Date	Rating	Price (Y)	Price Target (Y)
23-May-17	N	10835	11,000
10-Jan-18	N	14075	13,000
12-Nov-18	N	12730	12,000
29-Aug-19	N	13365	13,000
21-Feb-20	OW	15445	20,000

LG Chem Ltd (051910.KS, 051910 KS) Price Chart



Source: Bloomberg and J.P. Morgan; price data adjusted for stock splits and dividends.
 Initiated coverage Oct 08, 2002. All share prices are as of market close on the previous business day.

Date	Rating	Price (W)	Price Target (W)
19-Jul-17	OW	326500	390,000
16-Oct-17	OW	375000	430,000
27-Oct-17	OW	394500	480,000
11-Apr-18	OW	368000	460,000
23-Jan-19	OW	366000	440,000
24-Jul-19	OW	359000	410,000
25-Sep-19	OW	327000	390,000
06-Oct-19	OW	296000	360,000
17-Jan-20	OW	329000	380,000
06-Feb-20	OW	382000	450,000
20-Mar-20	OW	230000	370,000
28-Apr-20	OW	353500	420,000

The chart(s) show J.P. Morgan's continuing coverage of the stocks; the current analysts may or may not have covered it over the entire period.

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Global Research
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