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ISSUE BRIEF

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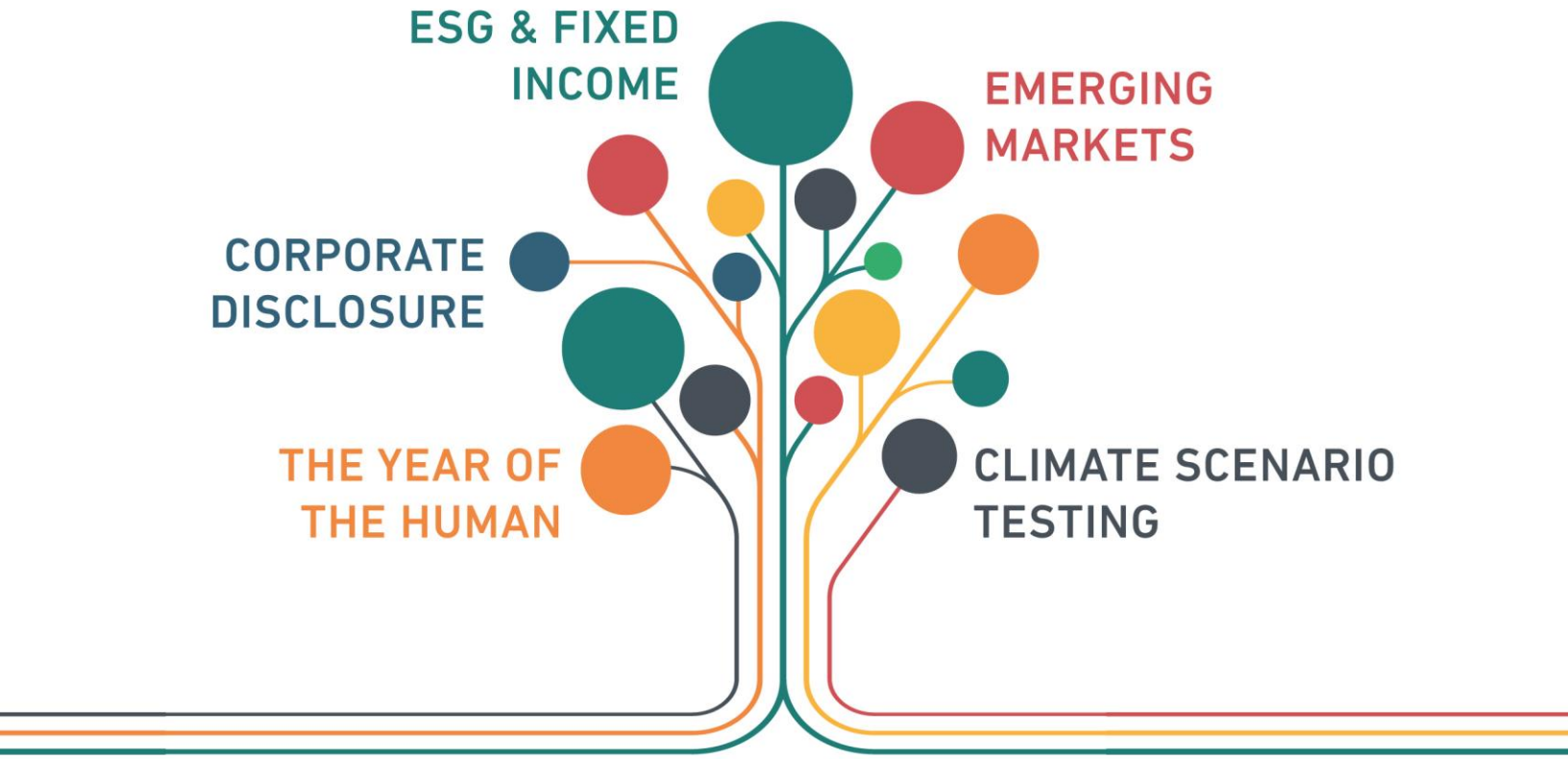

2018 ESG TRENDS TO WATCH

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January 2018

EXECUTIVE SUMMARY

Bigger, faster, more. Whether due to policy, technological or climatic changes, companies face an onslaught of challenges that are happening sooner and more dramatically than many could have anticipated. Investors in turn are looking for ways to position their portfolios to best navigate the uncertainty. In 2018, these are the major trends that we think will shape how investors approach the risks and opportunities on the horizon. In 2018, investors will…

1

SIFTING FOR MANAGEMENT QUALITY IN EMERGING MARKETS

…use ESG signals to help navigate the evolving size and shape of the Emerging Markets investment universe. More than 15% of Emerging Markets domiciled constituents of the MSCI ACWI Index have ESG Ratings that eclipse their country's ESG Sovereign Ratings, making them country outperformers worth watching.

2

FIRST STEPS IN SCENARIO TESTING CLIMATE CHANGE

…expand their view of portfolio climate risk from company carbon footprint to macro exposures across asset classes. We found that at least 40% of each major asset class is exposed to countries at high risk to irreparable physical damage under a high warming scenario.

3

ACCELERATION OF ESG INTO FIXED INCOME INVESTING

…be catalyzed to adopt ESG factors in fixed income investments, as demand from leading asset owners to align their ESG frameworks across asset classes coincides with interest in how ESG factors can add value to credit analysis. Recent research on ESG and equity performance suggests that a company's ESG Rating could signal a form of "unmatured" event risk.

4

LOOKING BEYOND SUSTAINABILITY DISCLOSURE

…look to alternative data sources to balance the growing volume of corporate sustainability disclosure. In our own ESG Ratings, 65% of a company's rating on average is driven by data sources beyond voluntary disclosure.

5

THE YEAR OF THE HUMAN

…increasingly seek opportunities to invest in talent quality, as Artificial Intelligence (AI) redefines work tasks to require higher skilled human input. While good workforce data is hard to come by, we find evidence that companies with stronger human capital practices had better productivity growth than industry peers.

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1 SIFTING FOR MANAGEMENT QUALITY IN EMERGING MARKETS

Picking good companies is challenging, and doubly so when they are based in markets that can be complex and opaque to global investors. Twenty-four countries are covered in the MSCI Emerging Markets Index today, up from just 10 when the index launched 30 years ago. To help navigate the evolving Emerging Markets investment universe in 2018, investors will rely on ESG signals to sift for quality in management – to help identify those companies that rise above their country's challenging environment.

How do you scale the ability to identify strongly managed companies in constantly changing, more opaque, higher risk markets?

When MSCI launched its Emerging Markets (EM) index thirty years ago, it covered 10 markets[1] and made up just 1% of the MSCI ACWI.[2] Today,[3] approximately 11% of the MSCI ACWI Index by market cap consists of Emerging Markets-domiciled constituents.[4] Over these years, exposures to country-level risks, such as regime shifts and social stability, continue to weigh heavily in the investing calculus. With the planned addition of 222 China-A large cap shares in 2018[5], the evolving size and shape of the Emerging Markets investment universe presents investors with a new challenge: how do you scale the ability to identify strongly managed companies in constantly changing, more opaque, higher risk markets?

Relative to their Developed Market peers, companies domiciled in Emerging and Frontier Markets often start with one arm tied behind their backs in terms of their home country's governance of institutions, human capital productivity and natural resources. This context is highlighted by our ESG sovereign ratings, which assess 198 countries and regions against 27 ESG factors, including management of natural resources and human capital.[6] Of the 24 markets that MSCI classifies as Emerging Markets[7], only 16% have

[1] EM countries at launch in 1988 include: Argentina, Brazil, Chile, Greece, Jordan, Malaysia, Mexico, Philippines, Portugal, and Thailand

[2] The MSCI Emerging Markets Index was launched on Jun 30, 1988 (https://www.msci.com/documents/10199/1493b63f-1ce8-418e-a82d-4aae72951f27)

[3] MSCI ACWI data as of November 30, 2017

[4] Source: MSCI BarraOne; EM countries include: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Russia, Qatar, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates.

[5] MSCI ACWI Emerging Market domiciled-company number as of November 30, 2017. The addition represents on a pro forma basis approximately 0.73% of the weight to MSCI Emerging Market Index and nearly approximately 27% by company count. Please see results of MSCI 2017 Market Classification Review. https://www.msci.com/eqb/pressreleases/archive/2017_Market_Classification_Announcement_Press_Release_FINAL.pdf

[6] https://www.msci.com/documents/10199/e092c439-34e1-4055-8491-86fb0799c38f

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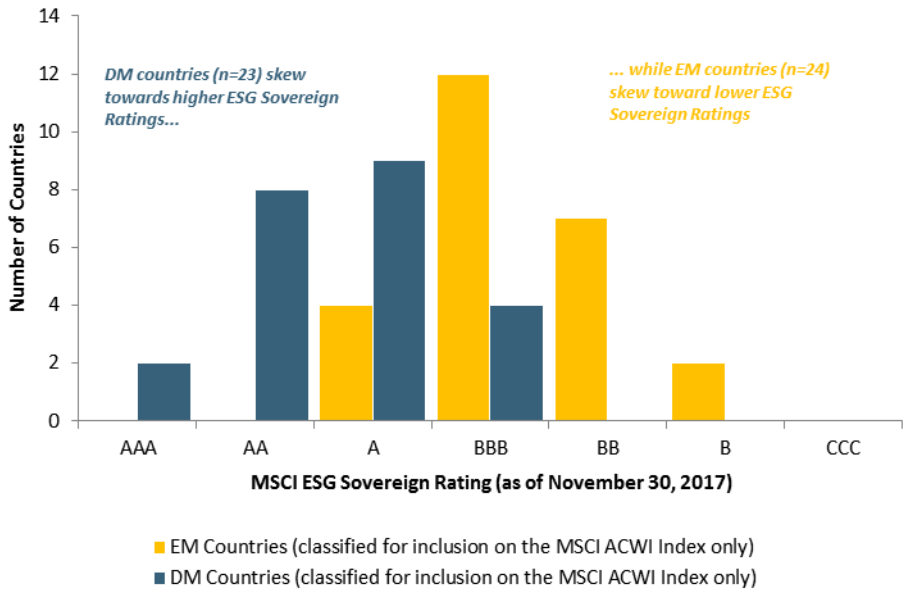
ESG sovereign ratings above BBB[8], compared to 83% for Developed Market countries (see Exhibit 1) as of November 30, 2017.

EXHIBIT 1: EMERGING MARKETS LAG ON ESG SOVEREIGN RATINGS…



Source: MSCI ESG Research, data as of November 30, 2017

Countries with strong ESG Sovereign Ratings have companies that, on average, are better positioned to manage ESG material risks and vice versa.

From a corporate perspective, there is a "lottery of birth" at play where companies may have impediments to performance and investors may face a lack of transparency. In fact, investors appear to anticipate a premium precisely because they expect that country factors manifest as risks for companies.[9] The same is true for ESG Ratings, where we assess the key ESG risks facing individual companies, such as labor or governance risks, relative to their global industry peers. Aggregated at the country level (on a capitalization weighted basis), the gap is stark – companies domiciled in countries with strong ESG sovereign ratings, on average, were less exposed and better positioned to manage significant ESG risks than global peers; and vice versa – as the sovereign ESG Ratings declined, ESG Ratings of companies domiciled in these countries tended to fall below global industry peers, primarily due to their elevated risk profiles (Exhibit 2). This "market drag" implies two things: the expectations for companies can partially be set by their domicile country barriers, and companies that transcend those barriers could actually have ESG performance that rivals the most advanced DM peers.

[7] As of November 30, 2017.

[8] MSCI ESG Sovereign Ratings range from AAA (best), AA, A, BBB, BB, B, to CCC (worst).

[9] Aswath Damodaran, New York University, http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

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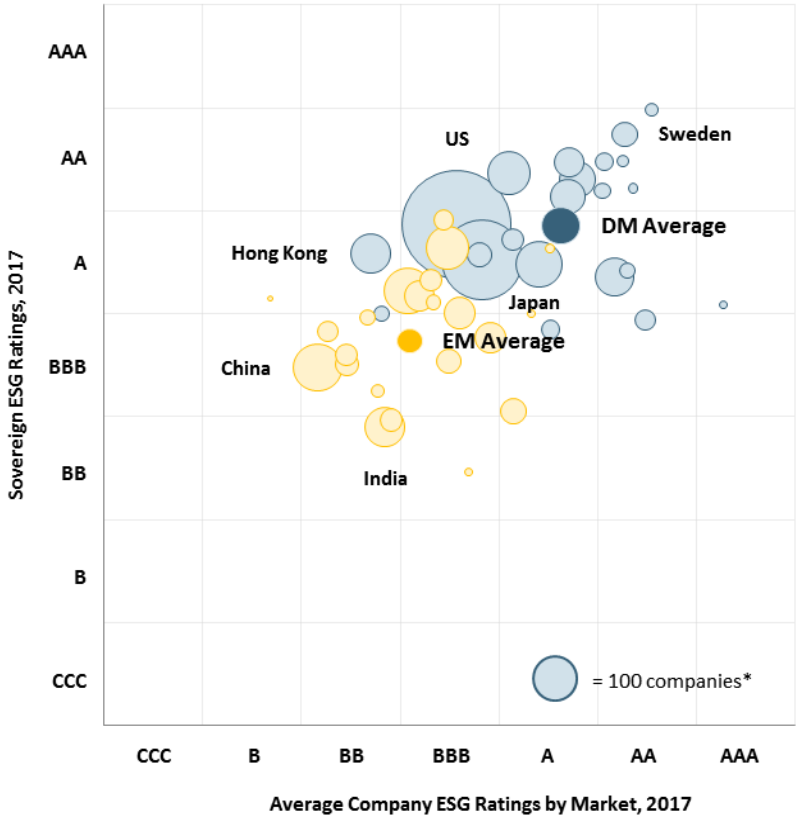
EXHIBIT 2: …AND THE "MARKET DRAG" IS REFLECTED IN COMPANY ESG RATINGS…

MSCI ESG Sovereign ratings versus average ESG ratings of companies domiciled in each market, MSCI ACWI index constituents as of November 30, 2017



**MSCI ACWI Index constituent companies as of November 30, 2017*
Source: MSCI ESG Research, data as of November 30, 2017

One approach: first narrow the universe to the top half of companies meeting global governance standards, than identify companies with ESG Ratings better than their domicile.

Historically, on-the-ground knowledge has been necessary to ferret out which companies are better positioned to transcend their country expectations. In fact, active managers of Emerging Markets funds appear to have been more successful than Developed Markets fund counterparts in recent years,[10] potentially because the scarcity of company information in these markets allows greater payoff to applying local expertise and knowledge. Advances in ESG data and analysis present an additional tool to filter companies at scale.

One approach to identifying Emerging Market companies that transcend their markets – or "country outperformers" – is to use assessments of companies' ESG performance. From a governance perspective, there can be vast differences in norms and practices, including the nuanced ownership and control characteristics that can be unique to each market. For instance, half of the India-domiciled constituent companies in the MSCI Emerging Markets Index are family firms,[11] with a prevalence of family conglomerate

[10] https://www.bloomberg.com/news/articles/2017-07-12/to-win-in-emerging-markets-avoid-the-passive-investing-rush

[11] MSCI ESG Research's India Country Report, 2017

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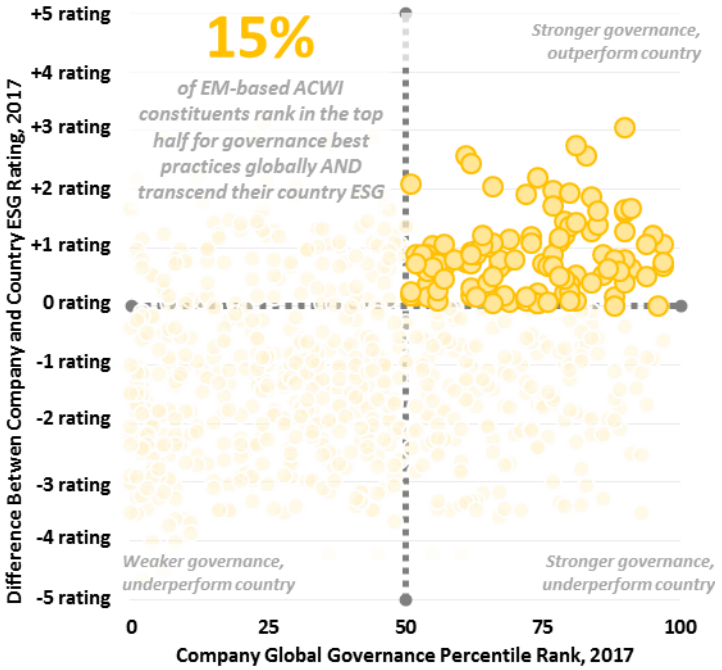
structures that are complex and may disadvantage minority shareholders. Comparatively, more than half of the Chinese firms are state-owned[12] where the possibility of misalignment between the strategic interests of the state and those of minority shareholders remains a key governance risk.[13] While understanding these market characteristics can help investors contextualize each company's governance practice, some global institutional investors chose to apply a minimum, global governance standard.[14] The approach to identifying "country outperformers" could first narrow the universe to the top half of companies in meeting global governance standards and then identify companies with ESG Ratings that are above their domicile country's ESG sovereign rating.

Exhibit 3 illustrates the results of taking such an approach: 15% of Emerging Market company constituents of the MSCI ACWI Index in MSCI ESG Research coverage passed these thresholds.[15] This quadrant of Emerging Market "country outperformers" highlights how painting a market with too broad a brush may miss the quality differentiation that lies underneath.

15% of Emerging Market company constituents of the MSCI ACWI Index in MSCI ESG Research coverage rank in the top half for governance practices globally and transcend their domicile ESG Sovereign Ratings.

EXHIBIT 3: …BUT SOME COMPANIES TRANSCEND THEIR MARKET IMPEDIMENTS.



Based on company constituents of the MSCI ACWI Index in MSCI ESG Research coverage as of November 30, 2017 (n=2,462). *Source: MSCI ESG Research, data as of November 30, 2017*

[12] State directly or indirectly controls 10% of the voting rights

[13] See MSCI ESG Research's India Country Report, 2017 and MSCI ESG Research's China Country Report, 2017 for an analysis of governance practices in more detail.

[14] http://www.ecgi.global/sites/default/files/codes/documents/Global%20Governance%20Principles%202014.pdf

[15] Based on company constituents of the MSCI ACWI IMI Index in MSCI ESG Research coverage as of November 30, 2017 (n=5,968).

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A growing body of research suggests a strong positive contribution of ESG characteristics to financial performance.[16] In this context, a company outperforming the expectations set by its home country's ESG standing may show superior returns relative to domestic peers. We compared the risk and return characteristics of the MSCI Emerging Markets ESG Leaders Index, which targets companies with the highest ESG Ratings representing 50% of the market capitalization by sector and region, to the MSCI Emerging Markets Index.[17] The MSCI EM ESG Leaders Index outperformed its benchmark by an annualized 3.79% between 2011 and 2016.[18] What has accounted for that outperformance? An attribution analysis of performance indicated that picking the right stocks, rather than systematic factors, contributed most to the outperformance.[19] The largest contributor to the index's active returns was due to stock-specific contribution, accounting for 2.42% of annualized return out of the 3.79% of total active returns.[20]

Emerging Markets economies are projected to continue fueling global growth and demand over the next two decades.[21] To capture some of that growth while controlling downside risks, especially given limited shareholder rights in many cases, we anticipate that institutional investors will increasingly turn to ESG analysis as a tool to help sort the wheat from the chaff in these complex and opaque markets.

[16] https://www.db.com/newsroom_news/ESG_study_Jan16.pdf

[17] The ESG Leaders Indexes target sector and region weights consistent with those of the underlying indexes to limit the systematic risk introduced by the ESG selection process. The methodology aims to include securities of companies with the highest ESG ratings representing 50% of the market capitalization in each sector and region of the parent index. https://www.msci.com/documents/10199/c341baf6-e515-4015-af5e-c1d864cae53e

[18] Period: 30-Dec-2011 to 30-Dec-2016.

[19] The attribution analysis of performance is based on a mix of back-test and actual data between December 30, 2011 and December 30, 2016. The MSCI Emerging Markets ESG Leaders Index was launched on June 6, 2013. Data prior to the launch date is back-tested data (i.e. calculations of how the index might have performed over that time period had the index existed). There are frequently material differences between back-tested performance and actual results. Past performance -- whether actual or back-tested -- is no indication or guarantee of future performance.
20 The ESG Leaders Indexes target sector and region weights consistent with those of the underlying indexes. Hence industry and country contributions to returns are expected to be low relative to benchmark.

[21] E.g. https://www.mckinsey.com/business-functions/operations/our-insights/global-growth-local-roots-the-shift-toward-emerging-markets; https://blogs.imf.org/2017/04/12/emerging-markets-and-developing-economies-sustaining-growth-in-a-less-supportive-external-environment/

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2 FIRST STEPS TO CLIMATE SCENARIO TESTING

Recommendations from the Financial Stability Board's Taskforce for Climate-Related Financial Disclosure (TCFD) have raised a good question for investors: how resilient is your portfolio to different climate scenarios? In 2018, we expect investors will expand their view of portfolio climate risk from measuring the carbon contribution of their equities portfolio to testing top-down views of macro climate risks that can better inform long-term asset allocation.

"Is our portfolio aligned with a two degree scenario?" Since Paris, this is perhaps one of the most frequently asked questions we get.

"Is our portfolio aligned with a two-degree scenario?" Since the Paris agreement (COP21) was approved in November 2016, this is perhaps one of the most frequently asked questions we get. Up to now, investors have focused on security selection issues by measuring the extent to which their portfolios' embedded carbon footprint might exceed a level of emissions required to keep the rise in global temperatures to below 2 degrees Celsius this century. That leaves out potentially half of the equation to building a climate-resilient portfolio. In 2018, as scenario testing against climate change takes center stage, investors will also be asking how their asset allocations could be exposed to climate shock at a macro level.

A catalyst for broadening this conversation has been the release of guidelines from the Financial Stability Board's Task Force on Climate-Related Financial Disclosure (TCFD).[22] The guidelines include a recommendation that companies, asset owners and investment managers, banks and insurance companies incorporate climate scenarios into their risk assessment. There are very few projections of macroeconomic implications by country or sector available, leaving a hole investors have to fill in taking a top-down macro view of climate scenarios.[23] The projections that do exist vary quite widely, focusing on different parameters and timeframes. For example, Nordhaus and Boyer[24] projected cumulative economic losses for different geographic regions due to climate change of between 3% and 18.1% under a scenario of a 6 degree warming, or between -0.65% and 4.9% for a 2.5 degree warming scenario by 2100. Hope,[25] on the other hand, projected

[22] https://www.fsb-tcfd.org/publications/

[23] While the Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA) and others have projected the level of physical parameters (e.g., temperature, precipitation etc.) and carbon intensities for carbon intensive sectors in different carbon emissions scenarios, potential macroeconomic impacts by regions and sectors are not clearly understood yet. Similarly 2nd degree and 3rd degree impacts (e.g., impact on industries dependent on carbon intensive industries) are not yet quantified.

[24] Nordhaus and Boyer 2000, *Warming the World: Economic Models of Global Warming*. This paper provides projections of catastrophic and non-catastrophic losses for a 2.5 degree scenario. For 6 degree scenario, it provides estimates for catastrophic losses only. In order to estimate total losses due to climate change in 6 degree, we have assumed non-catastrophic losses at 6 degree to be equal to the non-catastrophic losses at 2.5 degree.

[25] Hope 2006, as reported in *Climate Change and the Global Economy report, IMF* (www.imf.org/external/pubs/ft/weo/2008/01/pdf/c4.pdf)

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cumulative economic losses of between 0.2% to 2.55% for a 2.5 degree warming scenario.

In low warming scenarios, the cost of shifting the energy mix to combat climate change could put additional drag on economic growth. As per the European Bank of Reconstruction and Redevelopment (EBRD), this cost could be between less than 1% to more than 11% by 2050.[26]

If we limit scenarios along just one dimension – country exposure to climate risk – different asset classes have very different exposures to countries projected to be severely impacted under different warming scenarios.

There are some commonalities, despite the variance in timeframes, scope, and projected growth impacts. For instance, if we limit scenarios along just one dimension – country exposure to climate risk – different asset classes have very different exposures to countries that are projected to be severely impacted under different warming scenarios. For each country, climate risks can be separated into two distinct categories: transition risk (which includes the potential drag on economic growth from the cost of shifting the energy mix and infrastructure to combat climate change) and physical risk (which includes damage or destruction of physical assets in a country due to weather and oceanic conditions). These risks are not evenly distributed – some countries may be more vulnerable to transition risks in a low warming scenario than physical risks in a high warming scenario. How quickly climate-change restrictions are implemented is also a factor, as a more abrupt transition in the near term to keep the warming in a 2-3 degree range can decrease physical risk over the long term. Conversely, a business-as-usual scenario that dampens transition risks in the near term could lead to a high 6-8 degree warming that can exponentially increase physical risks further out.[27] These base scenarios are laid out in Exhibit 4.

There is a high degree of uncertainty as to how and when these tradeoffs eventually pan out, given the many policy and technological variables in play. There are additional second and third order effects such as migration, diseases and social conflict that are not necessarily accounted for in considering country transition risk and physical risk. Yet, we can make some preliminary estimates about how different scenarios might affect asset allocation. We placed countries/regions along the two trajectories of a low warming scenario versus a high warming scenario and mapped different asset classes' exposure to countries most exposed to either in a hypothetical portfolio with a typical asset allocation.

[26] European Bank for Reconstruction and Development, *The Economic Impacts of Climate Change Mitigation Policy, (www.ebrd.com/downloads/research/transition/trsp6.pdf)*. Costs are estimated for a 500 ppm GHG concentration stabilization target. As per IPCC's 5th Assessment Report, Working Group 1, RCP2.6 and RCP4.5 scenarios translate into a GHG concentration of 421 ppm and 538 ppm respectively. These two scenarios are also likely to result in global warming of around 1.8 degree and 2.6 degree respectively.

[27] See Figure A1 (page 13) of TCFD document: "Technical Supplement: The Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities," June 2017 for a conceptual illustration of the trade-off between transition risk and physical risk.

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EXHIBIT 4: OUTLINING EXAMPLE CLIMATE SCENARIOS

Scenario	Scenario Description
Low Warming	Low warming scenario requires countries undergo economic transition to limit temperature increases. This scenario suggests high near-term transition risk and lower longer-term physical risk. While the economic losses due to low carbon transition are estimated for a 500 ppm GHG concentration stabilization target,[28] the estimates due to physical damages correspond to a 2.5 degree warming by 2100 (Nordhaus and Boyer).
High Warming	In a high warming scenario, no substantial actions will be taken by the countries to limit the temperature increase. This scenario suggests low near-term transition risk but high longer-term physical risk. The economic losses due to physical damages are estimated for a 6.0 degree warming by 2100 (Nordhaus and Boyer).

	Estimated GDP Risk			
	Low Warming (Transition Risk)	Low Warming (Physical Risk)	High Warming	2016 GDP (USD billion)
North America	2.10	0.69	3.56	21,145
Eastern Asia	3.72	0.51	3.72	21,029
Western Europe	1.10	2.83	13.84	16,433
Latin America	1.86	2.30	5.41	3,985
Middle East & North Africa	11.11	2.53	5.54	3,961
Southern Asia	4.38	4.05	14.37	2,896
East Europe & Central Asia	6.55	0.78	7.53	2,859
Sub-Saharan Africa	1.40	3.91	6.20	1,496
Oceania	6.50	1.51	7.42	1,415

Source: Nordhaus and Boyer, EBRD, MSCI ESG Research

Exhibit 5 shows the divergence in the trajectories of different regions when faced with tradeoffs between low warming transition and high warming business as usual scenarios. Western Europe and the Middle East stand out as outliers. In Western Europe, the cost of transition is relatively low compared to other regions – the economies are diversified, policy mechanisms and the energy infrastructure are already initiated to reduce carbon output and brace for climate change. However, the Middle East would require a retooling of its oil-income dependent constituent economies to make an abrupt transition possible – so much so that the cost of transition could actually outweigh the physical damage the region could suffer from a changing climate. While the economies of East Asia and North America would suffer relatively equally under either scenario, the Middle East would be a clear net loser in the low warming scenario, while Western Europe and South Asia are the clear net losers in a high warming scenario.

[28] European Bank for Reconstruction and Development, *The Economic Impacts of Climate Change Mitigation Policy,* (www.ebrd.com/downloads/research/transition/trsp6.pdf).

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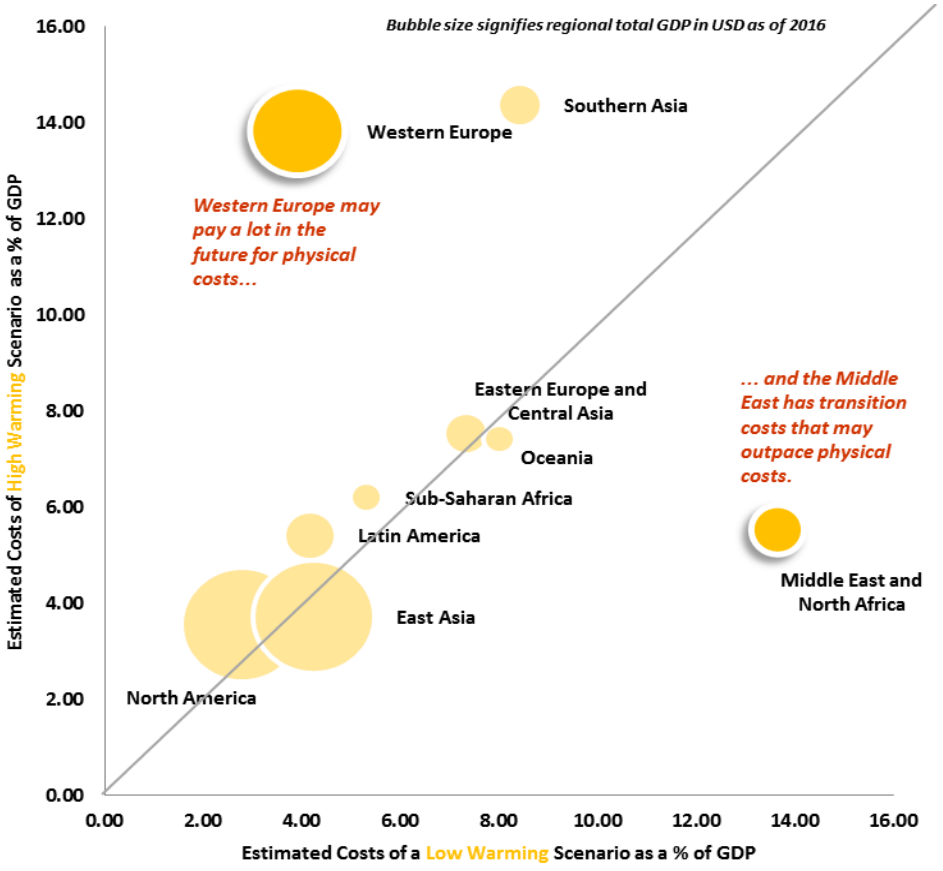
EXHIBIT 5: DIFFERENT SCENARIOS YIELD DRASTICALLY DIFFERENT OUTCOMES BY REGION...

Estimated cost as a percent of GDP in "High Warming" and "Low Warming" scenarios, as of 2016.



Source: Nordhaus and Boyer, EBRD, MSCI ESG Research

We then mapped the country and regional categorization along these two trajectories to securities across asset classes – constituents of the MSCI World and MSCI Emerging Markets Index (more than 2,400 constituents as of December 5, 2017) covering global equities, constituents of two funds benchmarked to Emerging Market and global fixed income indexes using Lipper data (as of December 31, 2017), and the IPD Global Annual Property Index by market size (as of December 31, 2016).

We illustrate the analysis by applying the mapping to a hypothetical portfolio that mirrors the asset allocation of typical public defined benefit plans in the U.S.[29] – 36% U.S. equities, 20% global and EM equities, 26% U.S. fixed income, 1% global and EM

[29] https://www.callan.com/wp-content/uploads/2017/08/Callan-2nd-Quarter-2017-CMR.pdf

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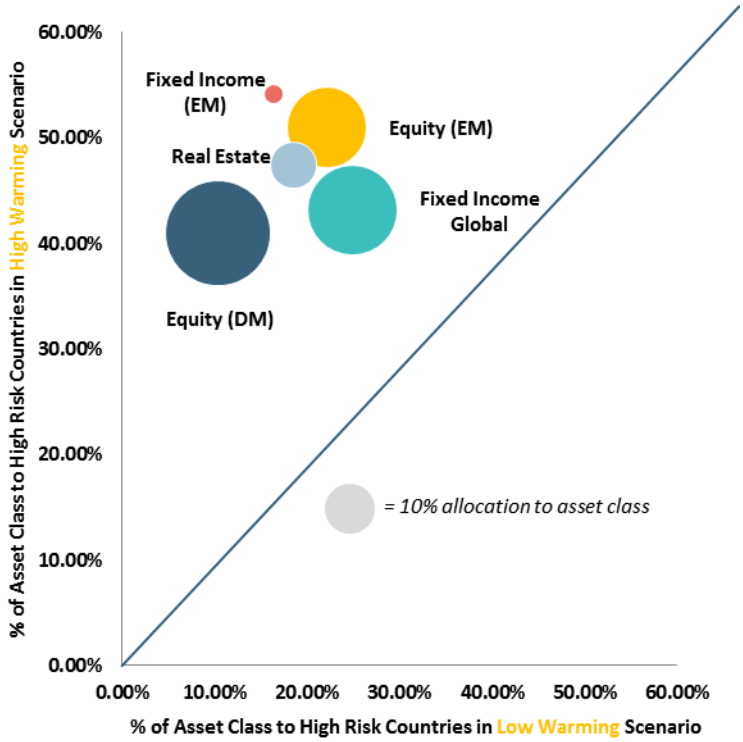
Using a hypothetical institutional portfolio, all the asset classes today are more exposed to negative growth from business as usual.

fixed income, and 7% real estate (excluding asset classes that MSCI ESG Research cannot currently model). If we consider an asset to be "high risk" when exposed to a country in the worst third of expected scenario outcomes globally, all of the asset classes today are more exposed to negative growth impacts from a business-as-usual high warming trajectory than a low warming trajectory with higher transition risks in the near term.

While institutional investors have so far focused largely on scrutinizing the carbon risks of large-cap developed market holdings in their public equity portfolios, Exhibit 6 makes clear that the majority of risk may come from more poorly positioned asset classes, at least given their country exposures today. Furthermore, to the extent that momentum from policy and technology shifts manages to put the world on a 2.5 degree path, the current weight of the typical investment grade bond portfolios to regions such Middle East & North Africa and Eastern Europe & Central Asia potentially makes allocations to the global fixed income portfolio one that increases total portfolio exposure to transition risks.

EXHIBIT 6: … WHICH COULD HAVE IMPLICATIONS FOR ASSET ALLOCATION DECISIONS.

Estimated exposure to "high risk" countries in "High Warming" and "Low Warming" scenarios by asset class.



"High Risk" assets were assets in the worst third of expected country outcomes as per MSCI ESG Research's analysis based on Nordhaus and Boyer and EBRD projections. Source: Nordhaus and Boyer, EBRD, MSCI ESG Research, MSCI BarraOne

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The high degrees of uncertainty along multiple parameters will make it very challenging for companies and investors to develop detailed climate scenarios with speed or confidence. But it is important to make a start. Many investors found that portfolio carbon footprinting turned out to be a necessary though insufficient first step toward identifying their carbon exposure. In 2018, they will similarly find that having a snapshot of today's regional and sector exposures to different paths of evolving climate risks is a first step toward a more complete view of their portfolio's long term resilience.

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3 ACCELERATION OF ESG INTO FIXED INCOME

Fixed income has historically lagged equities in the adoption of ESG analysis, but we think that is about to change. In 2018, we anticipate that "push" from leading asset owners eager to align their ESG frameworks across asset classes will coincide with the "pull" factor that ESG could add value to credit analysis. Recent research on ESG and equity performance suggests a possible historical link between a company's ESG rating and a form of "unmatured" event risk – something that fixed income investors may also want to monitor in the event of deteriorating credit conditions.

While historically the uptake for ESG integration by fixed income investors has lagged equities, there is reason to think that is about to change. According to a report by Eurosif from 2016, a higher volume of fixed income assets were already managed against ESG principles than equities in Europe.[30] Two major drivers are likely to increase the velocity of further adoption of ESG into fixed income in 2018.

Leading asset owners have now honed their approach to integrating ESG factors into equities and are ready to push for ESG frameworks across asset classes.

First, the same factor – client demand – that has driven widening adoption for European assets is beginning to be felt more globally. Leading asset owners have now honed their approach to integrating ESG factors into equities investments, and many are ready to make the push for a consistent policy and ESG frameworks across portfolios, with fixed income the next big area of adoption.[31]

This "push" factor already has some trailblazers to emulate in 2018. Swiss Re, the second largest reinsurer in the world, has set a model for implementing a consistent framework across asset classes for universe definition, performance measurement and portfolio monitoring.[32] Roughly three-quarters of its approximately USD 133 billion in assets are allocated to corporate and government bonds,[33] prompting fixed income managers globally to engage seriously with how to incorporate ESG factors into their investment process.

[30] http://www.eurosif.org/wp-content/uploads/2016/11/SRI-study-2016-HR.pdf

[31] http://securities.bnpparibas.com/files/live/sites/web/files/private/surv_esg_en_2017-07-07.pdf; BNP report indicates that nearly half of respondents already integrate ESG analysis into their DM public equities allocation; top four areas for planned increased exposure are ESG in EM public equities, EM Fixed Income, private equity and domestic Fixed Income.

[32] http://www.swissre.com/media/news_releases/nr20170706_MSCI_ESG_investing.html ; Driven by its belief and internal analysis that integrating ESG factors will improve long term risk-adjusted returns for the world's second largest insurer,[1] it decided in 2017 to switch to ESG indexes[2] as its equity and fixed income policy benchmarks.

[33] http://reports.swissre.com/2016/financial-report/financial-year/group-results/group-investments.html

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Others are also forming tools that could help pave the way for wider adoption of ESG frameworks among bond investors. The World Bank Group and Japan's Government Pension Investment Fund (GPIF) are developing a joint research program to explore practical solutions for integrating sustainability considerations into fixed income portfolios.[34]

At the start of 2017, investors could choose from only two "self-labeled" ESG Fixed Income ETFs, and the year ended with at least a dozen ETFs identifiable as fixed income with explicit ESG reference.

As client demand accelerates, competition between asset managers and wealth managers is likely to follow in the race to lead in filling out their line-up of ESG offerings. A case in point is in the ETF space. At the start of 2017, investors could choose from only two "self-labeled" ESG Fixed Income ETFs, but the year ended with at least a dozen ETFs that are identifiable as fixed income vehicles with an explicit ESG reference.[35] Our analysis of over 89,000 funds indicates that opportunities remain for early movers – ESG equity funds outnumber ESG bond funds by three-to-one globally, a disparity that rises to over four-to-one in the United States.[36]

This push for ESG adoption is likely to overlap in 2018 with a market and signal "pull." What makes integrating ESG in fixed income doubly appealing now is that it coincides with increased exposure to emerging market debt, alternative fixed income, and high yield and investment grade credit, as long-term institutional investors have become more adventurous in their search for yield.[37] Recent research suggesting that ESG factors may inform the overall risk profile[38] offers these investors the possibility of an additional tool for downside risk protection, as they prepare for the possibility of more volatile global bond markets in the years to come.

Can ESG add value to credit analysis? So far, the impetus to adopt ESG has been much stronger for equity managers than fixed income, in part because of a growing body of research[39] suggesting that a financially-focused ESG signal can help improve long term risk-adjusted returns for equity portfolios. Equity investors have experienced an onslaught of major negative events in recent years, including VW in 2015, Wells Fargo in 2016 and Equifax in 2017, which demonstrated the value of ESG signals in assessing portfolio risk.

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[34] http://www.worldbank.org/en/news/press-release/2017/10/11/world-bank-group-and-gpif-join-forces-to-mobilize-capital-markets-for-sustainable-investments

[35] Based on Lipper fund data and ETF.com; includes ETFs with ESG factors included in fund descriptions.

[36] Based on MSCI analysis of Lipper fund data, including analysis of over 89,000 fund families.

[37] Since the start of 2016 the share of emerging markets in global bond allocations has increased by around 1.5 percentage points, with Euro-area listed funds accounting for the lion's share of total inflows. http://www.businessinsider.com/r-record-year-for-emerging-market-bond-sales-as-frontiers-step-up-2017-12

[38] AQR 2017 *'Assessing Risk Through Environmental Social and Governance Exposures'*

[39] JP Morgan 2016, 'A Quantitative Perspective of how ESG can Enhance your Portfolio'; UBS 2016, "*Sustainable Value Creation in Emerging Markets";* Credit Suisse 2015, '*Finding Alpha in ESG*'; Deutsche Bank 2013, '*The Socially Responsible Quant*'

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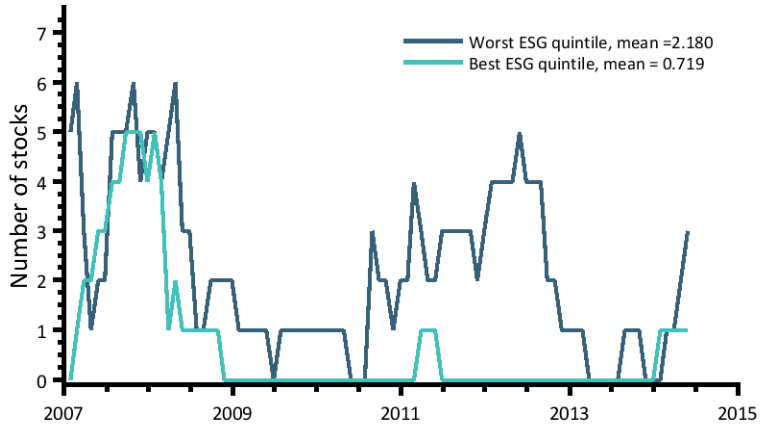
We found that companies in the bottom 20% of ESG Ratings experienced three times as many 95% drawdowns as companies in the top 20%.

These cases are not simply anecdotes. In a recent paper, "Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk and Performance,"[40] we analyzed all constituents of the MSCI ACWI Index since 2007, although the triggers for the observed extreme declines in value are unknown a priori (they could have been triggered by a variety of market and business-related incidents, not necessarily so-called "ESG events"), identifying tail events whereby companies had experienced a 95% or greater decline in share price over a three year period. We found that companies in the bottom 20% of MSCI's ESG Ratings experienced three times as many incidents of these extreme drawdowns as companies rated in the top 20% (Exhibit 7). It is possible that, over the past 10 years, a company's ESG Rating at a given point in time could have signaled event risk that might not have unfolded for some years – a form of "unmatured" event risk.

EXHIBIT 7: IDIOSYNCRATIC INCIDENT FREQUENCY OF TOP AND BOTTOM ESG QUINTILE



Source: Foundations of ESG Investing: How ESG Affects Equity Valuation, Risk and Performance. MSCI, 2017

A prolonged period of low interest rates and ample access to funding has resulted in a benign credit environment,[41] encouraging bond investors to place more emphasis on yield than downside risk. Hence some signals of downside event risk contained in ESG ratings for corporate issuers may remain "unmatured" until credit conditions deteriorate.

In fact, bond investors have indicated more interest in the added value of ESG signals for sovereign credit precisely because of the continued deterioration in the credit

[40] https://www.msci.com/www/research-paper/foundations-of-esg-investing/0795306949

[41] https://www.moodys.com/research/Moodys-Higher-leverage-due-to-low-interest-rate-environment-raises--PR_373488

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worthiness of sovereigns over the past few years.[42] In a recent paper, Allianz Global Investors found that while country credit ratings appear not to fully incorporate sovereign ESG risks factors, ESG risks are nonetheless at least partially priced into sovereign credit risk as evidenced by the correlation between sovereign ESG scores and credit default swaps, a proxy to gauge the market assessment of credit risk for a particular sovereign.

Our follow up analysis examined the ESG ratings of 60 countries at the start of the each year between 2011 and 2014, to see how the spreads changed in subsequent periods.[43] We found that higher ESG-rated sovereigns typically had spreads that narrowed by more, or widened by less, than their lower-rated counterparts over the following three years. Spreads also on average narrowed more between 2011 and 2017 for countries that started with a wider discrepancy between market spreads and those implied by ESG scores, an indication that unpriced ESG factors may have been a source of information for investors.

If 2018 is the year that ESG takes off in fixed income, it may not be because fixed income investors are finally ready to adopt ESG principles, but rather because ESG is finally ready for fixed income investors. As long as ESG investments were limited to the principles of values alignment, of ethical investing and active ownership, it made sense that responsible investing would remain primarily equity-focused. But as ESG tools have been sharpened and as extra-financial criteria have emerged as powerful indicators for managing downside risk, fixed income investors have begun to take notice.

[42] Cite http://www.spcapitaliq-credit.com/cms/wp-content/uploads/MI-Research-SP-Global-Ratings-GlobalSovereignRatingTrends2017-170127.pdf?t=1485522332

[43] MSCI ESG Research, 2017, "Did ESG Ratings Help to Explain Changes in Sovereign CDS Spreads?"

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4 LOOKING BEYOND SUSTAINABILITY DISCLOSURE

For years, a growing number of institutional investors have pressured companies to disclose more of their ESG practices. Companies are responding, but voluntary disclosure has its limits in providing a full picture of companies' ESG risks. In 2018, we anticipate that the disclosure movement reaches a tipping point, as investors seek broader data sources that can balance the corporate narrative and yield better signals for understanding the ESG risk landscape actually faced by portfolio companies.

Companies historically have been caught between investor demands for transparency and a desire to control their corporate narrative.

Companies historically have been caught between investor demands for transparency and a desire to control their corporate narrative. On one side, investors have supported numerous efforts to encourage company disclosure.[44] They have enlisted regulators to compel disclosure on select topics or metrics and influenced exchanges to require more disclosure on sustainability as part of their listing requirements.[45] On the other side, some companies may carefully manage disclosures through a painstaking editing and brand-polishing process[46] while protecting proprietary information.

As one of the world's largest consumers of voluntary sustainability disclosures,[47] MSCI ESG Research observes this pressure firsthand. What we see suggests corporate resistance is increasingly futile as investors globally are pressing hard for greater transparency around ESG and sustainability issues.[48] In response, companies are boosting the volume of voluntary disclosures and sustainability reports.

These public voluntary disclosures are a part of our ESG ratings research process. MSCI ESG Research shares with each company the data that we have collected from publicly disclosed documents.[49] Companies are invited to provide comments and feedback on

[44] https://www.blackrock.com/corporate/en-us/literature/whitepaper/viewpoint-exploring-esg-a-practitioners-perspective-june-2016.pdf shortlists the major disclosure frameworks on pages 4-5, including CDP, GRI, SASB, IIRC, and the FSB.

[45] See for example: http://www.sseinitiative.org/; https://www.world-exchanges.org/home/docs/studies-reports/SE&SD-Report17.pdf; http://iri.hks.harvard.edu/files/iri/files/corporate_social_responsibility_disclosure_3-27-15.pdf

[46] https://www.theguardian.com/sustainable-business/2016/aug/20/greenwashing-environmentalism-lies-companies

[47] https://www.msci.com/documents/1296102/1636401/MSCI_ESG_Research_Factsheet.pdf/411954d3-68af-44d6-b222-d89708c5120d

[48] https://corpgov.law.harvard.edu/2017/04/25/the-importance-of-nonfinancial-performance-to-investors/

[49] MSCI ESG Research does not conduct surveys of companies, nor will it use or accept non-public information from companies or other sources. Any company disclosed information that is used in MSCI ESG Research's ratings research

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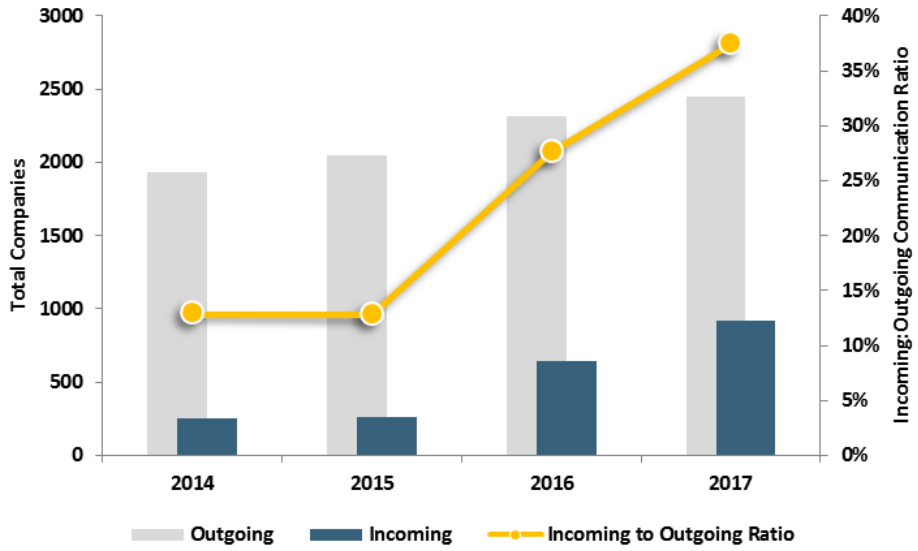
Between 2014 and 2017, the ratio of incoming company queries to outgoing company communications nearly tripled.

the data in the reports. We have observed a dramatic increase in the volume of "inbound" communications from issuers asking about their ESG assessments, while the volume of our "outbound" communications (invitations to review their data) has stayed relatively level. Between January 1, 2014 and November 30, 2017, the ratio of incoming company queries to outgoing company communications nearly tripled for MSCI ACWI Index constituents (Exhibit 7), a statistic we take as a sign that companies are paying increased attention to how they are assessed.

EXHIBIT 8: VOLUME OF COMMUNICATIONS WITH ISSUERS BY YEAR, OUTGOING VS. INCOMING



Source: MSCI ACWI Index constituents as of November 30, 2017. MSCI ESG Research, 2017

Investors should be encouraged by companies' increased willingness to invest in providing more transparency around ESG issues. At the same time, it is important to note that company disclosure provides only a partial understanding of a company's underlying risks. Take the Wells Fargo customer account scandal as an example. At the beginning of 2016, Wells Fargo's cross-selling prowess, for which the company has reported metrics such as percentage of customers with multiple Wells Fargo accounts,[50] was the envy of other banks.[51] By the end of the year, other members of the banking

process must be publicly disclosed. See https://www.msci.com/for-corporate-issuers. MSCI ESG Research invites all corporate issuers at least once per year to engage in a standardized data review process through which issuers may review the ESG data that we have collected on their company to produce various MSCI ESG Research reports, including the MSCI ESG Ratings report.

[50] https://www08.wellsfargomedia.com/assets/pdf/about/investor-relations/presentations/2014/consumer-lending-presentation.pdf

[51] https://www.forbes.com/sites/halahtouryalai/2012/01/25/the-art-of-the-cross-sell/#72023b1a55a3

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industry were questioning the practice and scrutinizing their own cross-selling policies.[52] In fact, even relying on audited, regulator-mandated financial data can provide an imperfect picture. In 2016 alone, 22% of all U.S.-listed companies issued "non-material" restatements on their regulatory filings and 7%, or 669 companies, issued a material restatement; both statistics were actually six-year *lows*.[53] Whether disclosure is voluntary or mandatory, it may not provide a full picture of a company's practices or reveal obvious lapses in internal controls.

An objective signal of a company's material ESG risks cannot primarily be driven by an issuer's own corporate narrative, particularly when much of that narrative is purely voluntary.

The fact that companies tend to put their best foot forward may not be lost on investors. A 2017 PwC survey of U.S. investors found that 62% felt they don't "have enough trust in the information companies report" to be confident in investment analysis and decisions.[54]

What this suggests is that an objective signal of a company's ESG risks cannot primarily be driven by an issuer's own corporate narrative, particularly when much of that narrative is purely voluntary and not subject to regulatory (or even auditor) oversight. We find that additional information sources are crucial to balance self-disclosed information. In the era of big data, the opportunity exists to extract more data from a wider variety of publicly available sources that can provide a more accurate and complete picture of companies' ESG risks and performance.

To illustrate how important these additional data sources are to ESG assessments, relative to the contribution of voluntary company ESG disclosure, we decompose the contribution to our ESG ratings by sources of information. We separated sources of information into:

- **Voluntary company ESG disclosure**, which includes data from sustainability reports and corporate websites covering all MSCI ACWI Index constituents where available
- **Mandatory company disclosure**, such as financial filings and proxy statements, covering over 28,000 companies globally
- **Enforcements and media sources**, such as databases on government fines, violations and investigations, as well as 1,600+ local and global media outlets
- **Datasets on specialized topics from government, academic, NGO and commercial sources** such as those provided by the World Bank; Eurostat; International Labor Organization; Water Resources Institute; the Lamont-Doherty Earth Observatory; UK Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR); International Chemical Secretariat (ChemSec); US Bureau of Labor Statistics; and others, covering more than 100 specialized datasets.

[52] https://www.apnews.com/7007a4cd928240679a0c7cd359d1607b

[53] https://blogs.wsj.com/cfo/2017/06/07/financial-restatements-hit-six-year-low/;

http://www.auditanalytics.com/blog/2016-financial-restatements-review/

[54] https://www.pwc.com/gx/en/corporate-reporting/assets/cr-survey-us-final.pdf

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Different sources of information contribute to different scoring components of the ESG Rating. For example, mandatory disclosure is the predominant information source underlying the sub-model for assessing corporate governance practices.[55] We examined a sample of our coverage universe, the 2,434 constituents of the MSCI ACWI Index, as of November 30, 2017.

The implication here is pretty simple: more voluntary disclosure may contribute more to the ESG rating, but may only result in improved ratings up to a point.

What we found helps illustrate both the value and potential limits of voluntary disclosure in our ESG signal. Fully 35% of any given company ESG rating, on average, is composed of scores that rely on what a company has disclosed through voluntary sources, while the other 65% is composed of scores using data from specialized data sources, enforcement and media sources, and mandatory disclosure.[56] For companies that are "strong disclosers,"[57] 39.5% of their ESG Ratings came from scores that rely on voluntary ESG disclosure. This compares to 27.4% for the "weak disclosers." Because voluntary ESG disclosure does not drive the majority of the ESG Rating, "strong disclosers" are not automatically highly rated, and "weak disclosers" are not automatically lowly rated. In fact, 5% of "strong disclosers" got a rating of B or lower (considered "ESG Laggards," as ratings range from AAA to CCC), and conversely, almost 60% of "weak disclosers" got a rating of average or above. The implication here is pretty simple: more voluntary disclosure may contribute more to the ESG rating, but may only result in improved ratings up to a point.

[55] Other important sub-models that drive the overall ESG Rating include the risk exposure model which relies predominantly on specialized data sources, and the risk management model which relies predominantly on voluntary corporate ESG disclosure.

[56] A company's ESG Rating is driven by major its management practices and performance vis-à-vis the level of industry-specific ESG risks the company faces (risk exposure) and, its corporate governance practices. To assess the first input to the signal i.e. whether the company has requisite management, the model relies heavily on voluntary ESG disclosures. Higher level of relevant company's voluntary disclosures on its practices and performance informs the model better, relying less on other three sources. The second input to the model i.e. risk exposure is informed by our modeled non-company datasets while the last input to the model, corporate governance practices is researched based on the mandatory company disclosures. To understand the how much our model signals are driven by availability of these sources.

[57] The MSCI ESG Rating model does not "score" companies on the volume of disclosure they make, nor do we make this data public as it is used for largely internal purposes. Solely for this analysis, we have categorized companies based on a qualitative assessment of companies' disclosure practices, as follows: Strong disclosers: Company reports on extensive list of KPIs found in CSR report and/or integrated with other disclosures and/or on its website; Industry standard disclosers: Company provides general statements, few datapoints/KPIs covered in CSR report, integrated with other disclosures, and/or on its website; **Weak disclosers:** Company provides only non-ESG specific information on career websites, investors relations page, financial or regulatory disclosure

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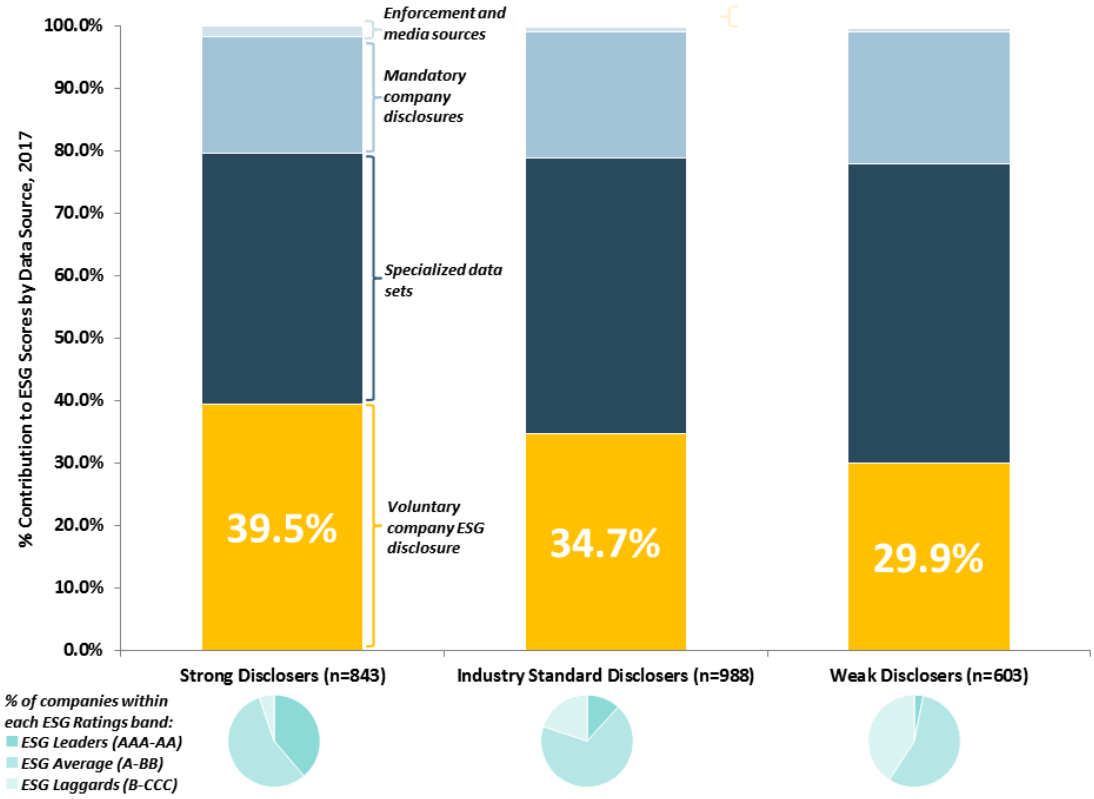
EXHIBIT 9: VOLUNTARY COMPANY DISCLOSURE IS A SIGNIFICANT, BUT NOT PREDOMINANT, CONTRIBUTOR TO ESG RATINGS



2,434 constituents of the MSCI ACWI Index as of November 30, 2017
Source: MSCI ESG Research;

While investors will, and should, continue to demand greater corporate transparency, they also need objective signals that don't overly rely on what companies say they do. As campaigns for improvements in disclosure ramp up this year, we may find that we hit a turning point in how investors view such disclosures. The availability of big data will likely increase and play a crucial role in balancing the corporate narrative to produce a more powerful ESG signal.

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5 THE YEAR OF THE HUMAN

As artificial intelligence (AI) assumes more and more tasks traditionally performed by humans, many jobs for people may require higher levels of skills and cognitive abilities. In 2018, investors will increasingly seek opportunities to invest in talent quality. While good data is hard to come by, some available metrics help differentiate companies' talent enhancement practices.

McKinsey has projected that by 2030, 75 million to 375 million workers globally will need to switch occupational categories, as a significant percentage of work tasks become automated.[58] For many roles, automation of routinized tasks will actually require an individual to use higher level cognitive, creative and social skills in their evolving role. According to the World Economic Forum's survey of top executives at 371 individual companies, respondents expected that more than half of all jobs which will require higher level cognitive abilities in 2020 do not require them today.[59]

Even as companies keep parroting that "our people are our most valuable assets," they are highly secretive when it comes to divulging even the most basic workforce information.

Finding good quality data on talent quality is difficult. Even as companies keep parroting that "our people are our most valuable assets," they are highly secretive when it comes to divulging even the most basic workforce information, making it difficult for investors to differentiate and value the human capital of companies. But even some simple comparisons using basic indicators can provide intriguing insights, at least into the level of managerial attention to talent quality.

To get a sense of which companies truly value human capital, we use MSCI's ESG Metrics dataset, which includes Human Capital metrics, to analyze around 1,600 companies that are constituents of the MSCI World Index.[60] We focus on five metrics in particular that can serve as proxies for the extent of managerial attention to talent enhancement practices: workforce engagement surveys, leadership training programs, workforce diversity, training hours and support for degree programs. Companies fall into three distinct categories based on their current talent enhancement practices:

- **Leaders** are companies that evidence some "best practices" such as conducting annual engagement surveys, have comprehensive succession planning and development programs at multiple levels, set quantitative diversity targets in

[58] "Jobs lost, jobs gained: Workforce transitions in a time of automation." (2017). McKinsey Global Institute (December).

[59] "The Future of Jobs, Employment, Skills and Workforce Strategy for the Fourth industrial revolution." (2016.) World Economic Forum (January).

[60] MSCI World Index constituents as of December 5, 2017 (n=1654 companies)

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recruitment process, reports annual training hours per employee, offer support for degree programs and certifications to employees;

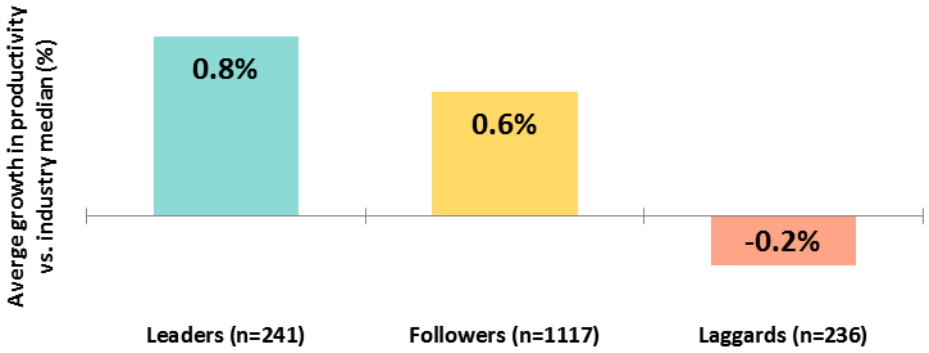
- **Followers** are companies that have put in place some "standard practices" such as conducting engagement surveys sporadically, provide initiatives to facilitate diversity and inclusion, have programs focusing on internal upward mobility through training and development, etc.
- **Laggards** are companies that have not provided any publicly disclosed evidence of employee engagement initiatives, plans to improve diversity in workforce, or training and development activities.[61]

We found that talent enhancement Leaders tended to enjoy higher growth in revenue per employee than their industry peers.

We found that Leaders tended to enjoy higher growth in revenue per employee than their industry peers. In contrast, companies with no evidence of talent enhancement practices underperformed compared to their industry peers. The "premium" that is correlated to best talent enhancement practices stood at 1.0% in the 2012-2016 year period (difference between average growth in revenue per employee for Leaders vs. Laggards).

EXHIBIT 10: COMPANIES WITH STRONGER HUMAN CAPITAL PRACTICES HAD BETTER PRODUCTIVITY GAINS

Average growth in employee productivity (revenues in USD mn / employee) in 5-year period (2012-2016) as compared to industry peers, measured by company skill enhancement practices. Companies are classified based on five metrics: workforce engagement surveys, leadership training programs, workforce diversity, training hours and support for degree programs. MSCI World constituents as of Dec. 5, 2017.



Source: MSCI ESG Research; calculations based on financial data from Thomson Reuters

The simple correlation of course does not tell investors whether companies with improving financial performance invest more in talent enhancement, or the other way around. While data availability prevents more definitive analysis, data from a reduced analytical sample provides a hint of whether talent enhancement practices could

[61] Companies are classified as "Leaders" if they have at least two best practices and at least two standard practices; "Followers" if they have at least one best practice or standard practice; or "Laggards" if they have no best practice or standard practice in place. Individual practices are determined as best, standard or weak practice based on their potential impact to attract, retain and develop skilled workforce. For more information on the indicators and methodology, please see ESG Metrics

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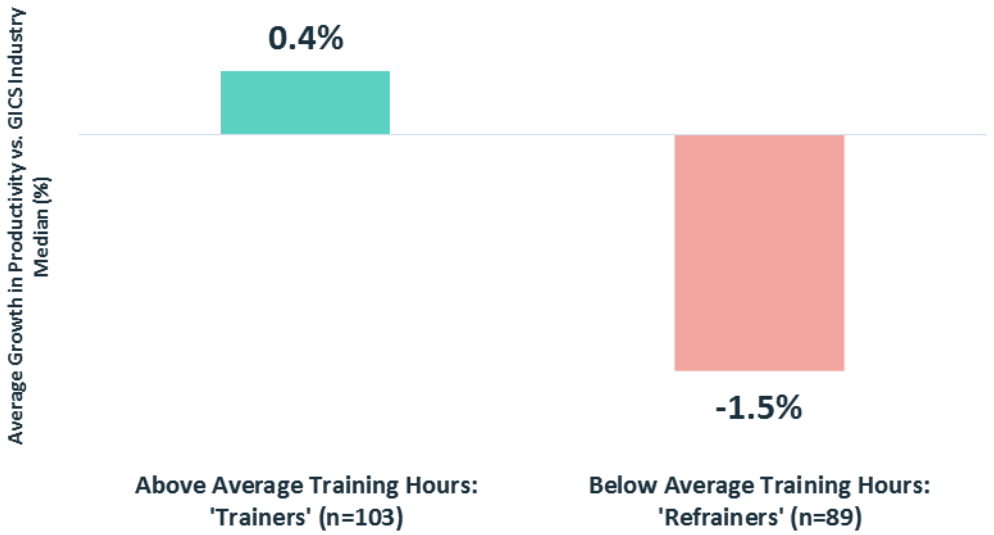
provide some indication of improving financial performance, at least for some companies.

Comparing "trainers" to "refrainers" in terms of training hours relative to industry mean, "trainers" saw revenues per employee increase faster than "refrainers."

We focus on the constituent companies of MSCI World Index[62] that made disclosure of their training hours in 2014. Comparing the "trainers" – those with training hours per employee that exceeded their industry median – versus the "refrainers" – those that lagged the industry median – we found that in the subsequent three years employee productivity (revenues in USD mn/ employee) of the "trainers" increased by 0.4% compared to their industry mean, while productivity fell by -1.5% for the "refrainers" compared to their industry mean.

EXHIBIT 11: "TRAINERS" EXPERIENCED HIGHER AVERAGE PRODUCTIVITY GROWTH THAN "REFRAINERS"

Average growth in Employee productivity (revenue in USD mn / employee) in 3-year period (2014-16) as compared to industry peers, measured by annual training hours in 2014.



Source: MSCI ESG Research, Calculations based on financial data from Thomson Reuters

While the rise of the machines will impact nearly all industries and geographies, some industries will be more affected by what the World Economic Forum calls "skills instability."[63] In Financial Services, for example, 43% of the top skills needed across the industry are expected to change by 2020. The next most affected industries are Basics and Infrastructure (42%), and Mobility (39%). The least affected industry between now and 2020 is Media, Entertainment and Information (27%), already in the midst of a major skills displacement.

[62] As of December 5, 2017.

[63] http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf

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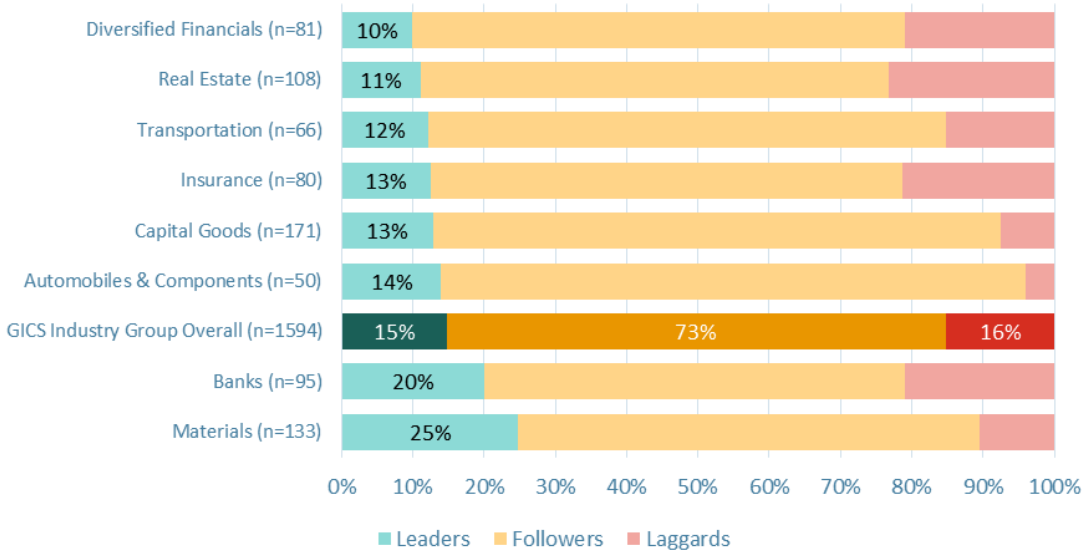
How do these industries stack up when it comes to investments in skills enhancement? We map the 24 GICS® Industry Groups[64] to those projected by the World Economic Forum study to experience the greatest skills instability. Surprisingly, we find that companies in Diversified Financials — despite facing a massive change in skill sets needed – and the Real Estate industry exhibited fewer "best practices" when it came to addressing skills enhancement.

EXHIBIT 11: INDUSTRIES FACING HIGHER SKILL INSTABILITY VS. SKILL ENHANCEMENT PRACTICES



Source: MSCI ESG Research, Calculations based on financial data from Thomson Reuters

Institutional investors are getting serious about prying open the black box of talent management.

As the ability to manage "skill instability" becomes more critical to future competitiveness, institutional investors are getting serious about prying open the black box of talent management. Some have already been using websites such as Glassdoor or LinkedIn to gauge employee engagement and turnover,[65] despite problems with information reliability.[66] Others are enlisting policymakers to catalyze improved disclosure in this area. The Human Capital Management Coalition, for example, was founded by institutions overseeing USD2.8 trillion in assets and recently petitioned the US Securities and Exchange Commission to mandate disclosure on topics such as the demographics, stability, composition, skills and capabilities, productivity and compensation of the workforce.[67]

[64] GICS is the global industry classification standard jointly developed by MSCI and Standard & Poor's.

[65] https://hbr.org/2017/03/why-the-millions-we-spend-on-employee-engagement-buy-us-so-little

[66] http://hrmagazine.co.uk/article-details/glassdoor-honest-reviews-or-trolls-paradise

[67] https://www.sec.gov/rules/petitions/2017/petn4-711.pdf

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Investor appetite for investing in human capital is also growing, despite challenges in data availability. Some of the world's leading institutional investors are coalescing around workforce diversity, particularly in places where companies have yet to maximize their talent pools. Take Japan, where our 2017 Women on Boards report found the country to have the highest proportion of all-male boards globally.[68] Here, the country's largest pension fund, the Government Pension Investment Fund (GPIF), has allocated USD 1.8 billion[69] to investments that track an index composed of sector leading companies which promote women in the workforce (WIN). The WIN index leverages the treasure trove of gender diversity data that has only recently become available in Japan, driven by the Ministry of Labor requirements. Engaging companies to increase the diversity of their boards has also been a key theme for some U.S. investors such as CalPERS, CalSTRS and NYCERS; BlackRock recently announced that it too would make diversity a key engagement topic for 2018.[70]

Given the demand for mandated disclosure, appetite for investment solutions and targeted engagement on human capital issues, 2018 is already shaping up to be the year of the human, even as automation eats into employment. As investors gain access to greater transparency, artificial intelligence may be the spur to test the corporate mantra of "our people are our greatest asset," with investors sifting out winners and losers in the race for human capital.

[68] 30.4% of companies with all male boards as of October 16, 2017; Women on Boards: Progress Report, December 2017

[69] Calculated based on the 20% allocation to this index on an initial 3% of its domestic equity allocations — or roughly ¥1 trillion ($9 billion) http://www.pionline.com/article/20170706/ONLINE/170709963/gpif-selects-3-esg-indexes-for-yen1-trillion-allocation

[70] https://www.blackrock.com/corporate/en-us/about-us/investment-stewardship/engagement-priorities

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