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2015 ESG Trends to Watch

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If 2014 was any guide, there is a shortening lag between when ESG issues emerge and when markets and regulators react. Whether it is shifting regulations targeting the 'tax gap', a new market benchmark to define green bonds, or the adoption of low carbon investment solutions, our ***2014 ESG Trends to Watch*** report highlighted areas where institutional investors showed growing appetite to address longer term risks and opportunities.

We head into the new year with the backdrop of swooning oil prices and (re)newed geopolitical fault-lines, juxtaposed against a return to growth in the US and emergence of the next generation of tech darlings. Investors, companies, policymakers, and NGOs anticipate the upcoming climate talks in Paris with an equal measure of hope and fear. In this cacophony, which ESG trends will be most top-of-mind among investors in 2015?

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1. Aligning to Fuels of the Future

Are institutional investors positioned for the transition to renewable energy?

With media and political attention already focused on the 2015 UN climate conference in Paris, the rush among institutional investors to reduce their carbon exposure is gaining momentum. In 2015, we foresee that widespread adoption of de-carbonization tools will be followed by interest in aligning portfolio exposure to our future energy technology.

Institutional investors worldwide have come up a tremendous learning curve in the past year on understanding their exposure to carbon stranded assets. Whether catalyzed by a concern over mis-priced fossil fuel assets or pressure from a persistent call for divestment, investors have begun to scrutinize the carbon-related risks embedded in their portfolios. The options for investors have multiplied. From a simple snapshot measurement of companies' current carbon emissions, investors can now adopt a total portfolio accounting of current and future emissions, measured against clear market benchmarks.[i] From exclusions based on blunt measures such as industry classification, investors can now choose from a menu of portfolio construction techniques that range from selective exclusions to tilts of portfolio weights based on current and future carbon characteristics of individual securities.[ii]

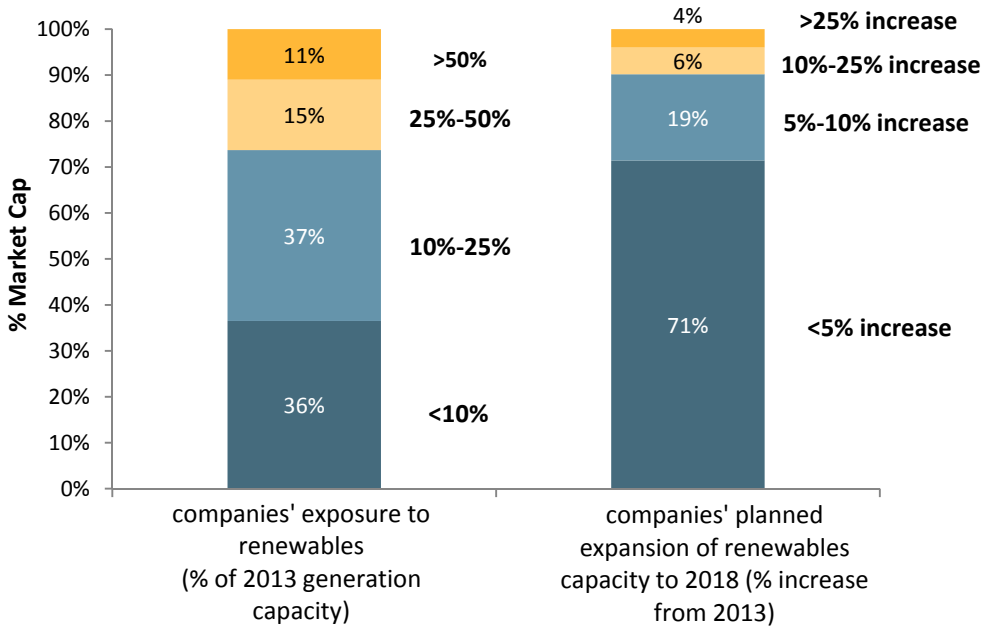
As institutional investors shift their portfolios away from carbon-intensive assets, the natural follow up question will be: **to what extent can we shift investments to align with the energy technologies of the future?**

According to the International Energy Agency, the share of global energy consumption from renewable fuels – including wind, solar, and hydro – will increase from 21% in 2010 to 25% in 2020.[iii] Already, in markets ranging from Germany and the US to India and Brazil, wind or solar power have reportedly reached cost parity with new fossil fuel-powered generation.[iv] While uncertainty around future policy support for renewable energy development clouds the forecast in specific markets, few question that the long term, global energy picture – and our fundamental energy infrastructure – will shift from its current energy mix.

Institutional investors have tended to confine the bets they make on future energy sources and green technology more broadly into their 'thematics' allocation. **Yet investors can be highly exposed – both positively and negatively – to fundamental shifts in energy technology in the broad, diversified equity and fixed income holdings that can make up the vast majority of a portfolio.**

In the MSCI ACWI Index as of November 2014, the aggregate power generation capacity of the utilities sector breaks down to 29% coal, 7% liquids, 26% gas, 14% nuclear, 14% hydro and 7% non-hydro renewables.[v] The diversity among these companies is instructive: while **over one-third of the companies (by market cap) currently has less than 10% generation capacity from renewable sources, 11% of companies derive more than 50% generation capacity from renewable sources**. Using MSCI ESG Research's data on the planned future capacity of all MSCI ACWI Index companies, we find that nearly 10% of power generation companies will increase renewables capacity by at least 10% in the next five years (see Figure 1).

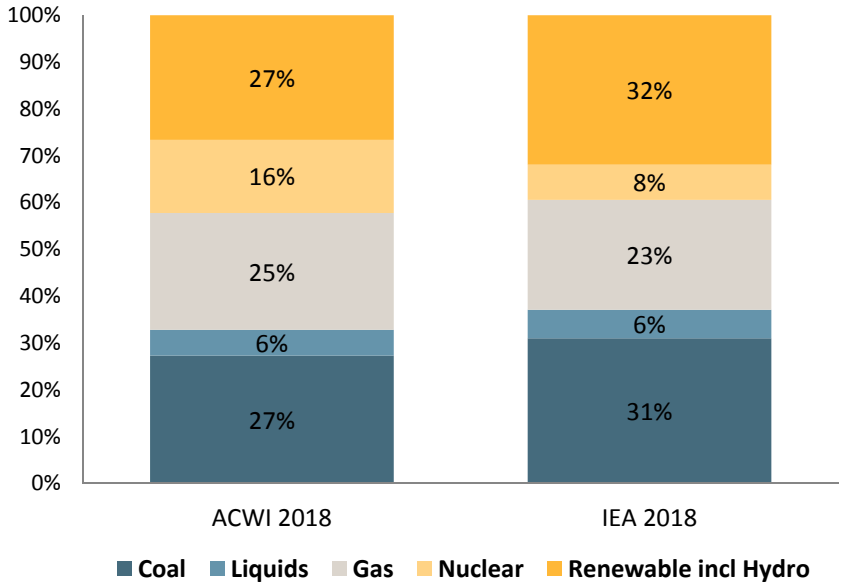
Figure 1: Differences in renewables capacity, power generation companies in MSCI ACWI (n=89)



Source: MSCI ESG Research

On the positive side, if all the additional renewable capacity that is currently planned by these companies is realized, an institutional investor replicating the MSCI ACWI Index would have increased its exposure to renewable generation capacity by 22% between 2013 and 2018, more than quadruple the rate of growth in coal and gas capacity. On the other hand, **this 22% growth rate pales in comparison to the 39% growth projected by IEA for renewable power generation between 2013 and 2018**[vi].

Figure 2: Projected Share of Installed Generation Capacity, by Fuel Type



Source: MSCI ESG Research, IEA; ACWI 2018 figures assume that all company-disclosed planned capacity for renewables will be realized. Numbers for all other fuel sources are based on growth rates projected by IEA for each fuel type globally in aggregate.

Further, despite this significant growth in planned renewables capacity, the share of renewable fuel (including hydroelectric) in the aggregate generation capacity of MSCI ACWI Index companies would roughly equal that of coal and gas.[vii] In comparison, IEA's projected growth rates would have the global installed capacity of hydro and other renewables overtake both coal and gas by 2018 (see Figure 2).[viii] While the publicly listed equities universe will undergo a shift in the underlying energy mix, it may not capture all of the growth in renewables generation capacity that is happening in the real economy. In other words, **without deliberately tilting more aggressively toward the companies with large and growing renewable capacity, investors potentially risk being under-exposed to significant growth in future fuel technology.**

Measuring the exposure to these underlying, fundamental shifts in our energy future is the sort of exercise that institutional investors may increasingly undertake. Beyond electricity generation and taking account of clean technology more broadly across all sectors, investors will be armed with improved data and analytics that can inform more deliberate alignment of their overall portfolio with our energy future.

2. Scrutinizing Director Characteristics

When do director characteristics matter for company performance?

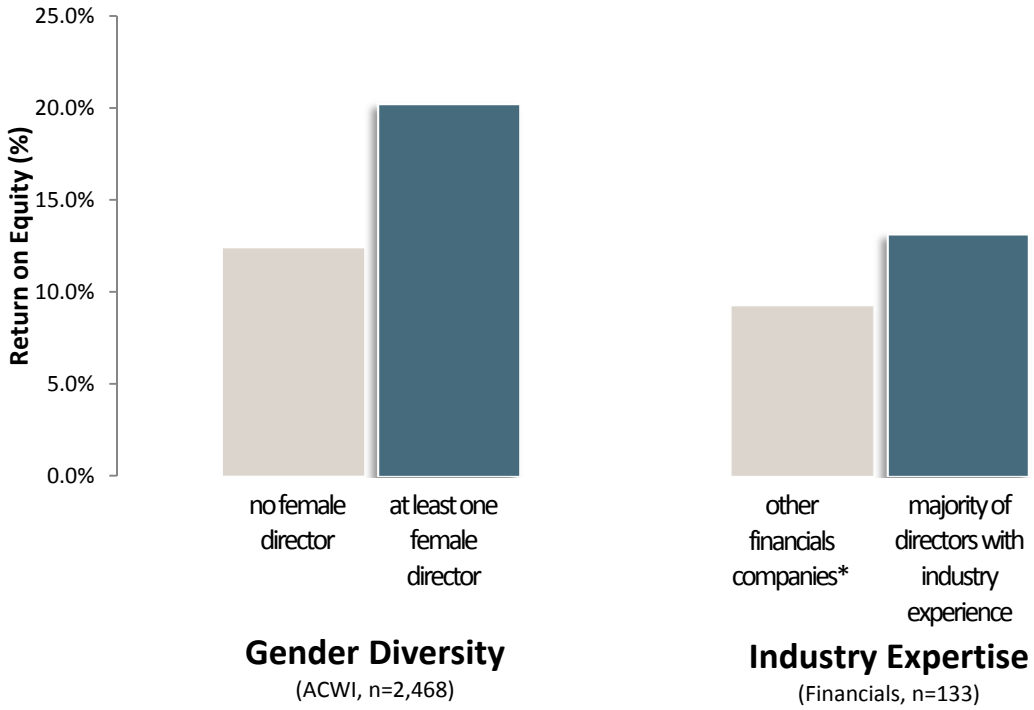
Every year investors discover that gross mismanagement at some company bypassed the attention of the board of directors, shining a harsh spotlight on how board members' experience helps them exercise oversight on behalf of shareholders. The Co-Op Bank was one such company in the past year that flirted with bankruptcy as the scathing UK media ridiculed its board's lack of appropriate business expertise.

Scrutinizing the characteristics of those who sit on boards has become a more interesting analytical exercise of late, as improved data and analysis advance us beyond a focus on board structure and policy. Despite inconclusive results from academic research so far, investors are increasingly factoring in considerations about both the depth and the breadth of directors' experience, individually and collectively as a team. In particular, we see institutional investors making more systematic efforts to assess the implications of two types of factors on company performance: industry expertise of individual board members and diversity of perspectives across the full board.

A snapshot from MSCI ESG Research's governance analyses[ix] presents some preliminary indication that industry expertise may correlate with stronger oversight, at least in sectors requiring specialized knowledge such as in finance. **Of 133 banks, investment banks, and insurers included in the MSCI ACWI Index, those with boards composed with a majority of industry experts – defined as individuals with five or more years of experience in banking, investment banking, corporate finance, or relevant regulatory bodies – generated larger return on equity** (see Figure 3). Over the past three years[x] these companies also experienced fewer controversies (average of 1.1 cases per USD 100 million in assets) such as criminal and civil investigations, bribery, fraud, and government fines, compared to industry peers without a majority of board members who have industry experience (average of 4.5 cases per USD 100 million in assets).

Fewer cases of bribery, fraud, shareholder lawsuits, and other governance-related controversies (per USD billion in market cap) were also a feature of companies that had a greater-than-mandated level of gender diversity on their board (for details of this analysis, please see MSCI ESG Research's ***2014 Survey of Women on Boards*** report). While academic research continues to debate whether and when board diversity might bring performance benefits, investors are moving to incorporate recent evidence from industry studies[xi] that suggest a performance upside for more diverse boards. **Return on Equity for the roughly one-third of ACWI Index constituents with no women on the board averaged 13.15, versus 20.21 for the benchmark[xii]**

Figure 3: Director Characteristics and Return on Equity, MSCI ACWI



*includes companies with no directors with industry experience, minority of the board with industry experience, and no disclosure

While the preliminary evidence is tantalizing, more rigorous analyses – especially those that increasingly take industry and regional context into account – may generate greater insights into potential links between director characteristics and long term value creation. As the availability of analytical tools improves, we anticipate that institutional investors will shift beyond targeted scrutiny of corporate 'blow ups' and toward systematic integration of these types of factors that are less about meeting best practice and more about capturing material impact.

3. Seeking Scalable Social Impact

Can investors find large scale exposure to positive social impact through listed equities?

Investors large and small are casting about for ways to steer capital toward positive social impact. Despite the tremendous need globally – 870 million people suffer from chronic diseases and 4 billion people lack digital access – very little of this willing capital is finding its way to address these needs.

According to the World Economic Forum[xiii], 'impact investing' is currently pegged at an estimated USD 50 billion. Compare this figure to the nascent market for green bonds: in 2014 alone, new green bond issuances totaled over USD 36 billion and could top USD 100 billion in 2015.[xiv] The key features of the

green bonds market that are now enabling its development – well-understood risk and return characteristics, a transparent framework to define 'green', and increasing liquidity and scale – remain elusive for social impact investment vehicles. Despite significant advancements in measurement standards by organizations such as the Global Impact Investing Network (GIIN), social impact investments are characterized by lack of comparable outcome measures across projects, diverse investor expectations for financial returns, small scale, and illiquidity. Additionally, there is confusion with social impact bonds, which are not bonds per se but contracts with public entities that come with a schedule of 'pay for performance' based on delivery of superior social outcomes, such as reduced recidivism rates.

Given these challenges, impact investing has traditionally been in the purview of family offices, foundation endowments, and high net worth individuals – investors that can be equipped for the deep due diligence and monitoring of project-specific metrics. However, large institutional investors on the one hand and a new generation of retail investors on the other have become increasingly interested in the possibility of linking their investments to positive social impact. The requirements for scale and liquidity of these investor segments are driving an exploration of options that can complement the traditional, small-scale approach. While there will be continued efforts to scale up high impact investments, the vast majority of investors are likely to allocate only a relatively small percentage of their portfolio to high-impact, illiquid investments and still need to decide how to invest the rest of their portfolio. In 2015, we believe that investors will re-conceptualize social impact in a way that aspires to apply some traditional social impact principles more broadly to asset classes that are more accessible, such as public equities.

Exposure to positive social impact through listed equities is currently largely restricted to small and micro-cap entities, whether those listed on the newly launched Social Stock Exchange in London and Toronto or simply 'pure plays'[xv]. Since large and mid-cap entities comprise roughly 85 percent of the global equity investable universe, however, investors who require exposure at scale need to venture into larger cap territory. **Is it possible for large entities with sprawling, diverse businesses and quarterly financial targets to measurably generate the kind of positive social impact that investors are seeking? What are the trade-offs in looking for 'impact' exposure at this scale?**

We analyzed the MSCI ACWI Index of approximately 2,400 constituents and screened for companies with strategies that address the social challenges of equitable access to food & nutrition, healthcare, finance, and communications, using data from MSCI ESG Research. The resulting screen sought to identify companies with the following characteristics:

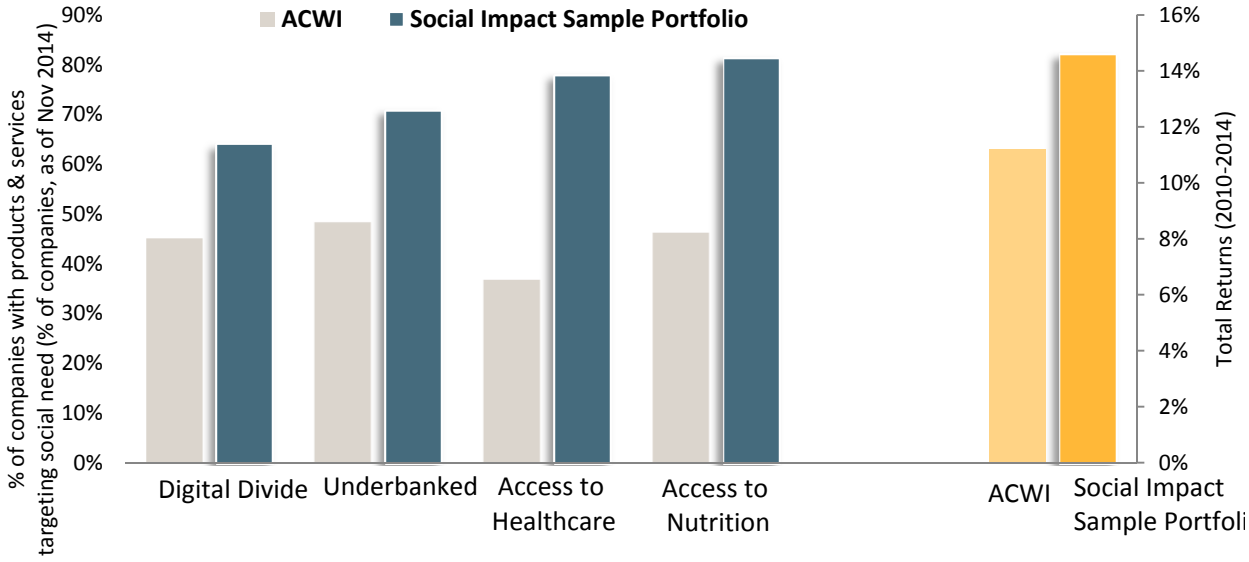
- Impactful products on the market, as measured by metrics such as high percentage of loans to small and medium-sized enterprises (SMEs) or portfolio of fortified food products
- Strong innovation capacity for addressing social needs, as measured by metrics such as R&D for drugs targeting the Top 10 diseases of the developing world
- Support for capacity building among the underserved, as measured by metrics such as programs aimed at decreasing the digital divide
- Clean track record on issues of product safety, marketing, and labor rights

The resulting sample portfolio of roughly 100 companies demonstrated some promising upside for investors seeking linkages to socially impactful activities (see Figure 4).

- Compared to a portfolio using the ACWI Index as the benchmark, the sample portfolio of companies **increased investors' exposure to markets with social needs by between 42% and 111% higher than the securities in the control portfolio,** depending on the sector[xvi].

- ACWI Index constituents in this sample portfolio include **Bank of Nova Scotia**, one of the few banks to have a strategic focus on microfinance and innovation in alternative branchless distribution channels, and **BT Group**, which has improved communications access to 95,000+ people in Africa and developed service offering targeting low income groups.
- While social impact investors have indicated a diverse range of expectations for financial returns[xvii], this subset of ACWI constituents with social impact exposure demonstrated **risk-adjusted returns during the sample period of September 2010 through November 2014 that are comparable to the benchmark**.

Figure 4: Exposure to Under-Served Markets, MSCI ACWI versus Social Impact Portfolio



Definitions:
Digital Divide = % of telecom companies with services for the underserved (low income population and remote places)
Underbanked = % of banks with microfinance products for SME and underserved communities
Access to Healthcare = % of healthcare companies with three or more products or R&D for Top 10 Diseases in the developing world
Access to Nutrition = % of food companies that offer healthy and natural products

Although seeking social impact exposure through large-cap public equities can address key barriers of scale and liquidity that have kept institutional investors on the sidelines, it is important to emphasize that this approach departs from the well-accepted criteria that 'impact investing' must intentionally target positive social outcome[xviii]. **These screened companies present potentially exciting developments toward solving pressing social problems, but they are not intentionally aimed at generating social good rather than financial profit.** Furthermore, investors seeking scalable impact exposure through listed equities face the question of whether their investments constitute additional capital allocated toward social needs that would otherwise not be funded. Investors have faced this same question over whether green bond issuances attract new capital to green activities that would otherwise not be funded, or whether they simply tag the same investments that would already be made. Many green bonds investors are leaning toward the view that having a transparent benchmark for impact-oriented investing allows the market to measure what that impact is actually worth to

investors, which should then filter down to companies and ultimately enable new opportunities targeting green investment in the future.[xix]

While some investors may prefer to stick closely to traditional approaches to impact investing, a scalable approach to social impact exposure increases options for a wider range of investors who seek to measure and augment the social impact of their invested capital. In 2015, we anticipate that the ability to overlay exposure to social impact opportunities across broad, diversified public equities portfolio will attract new investor segments with the potential to shift significant capital toward social needs.

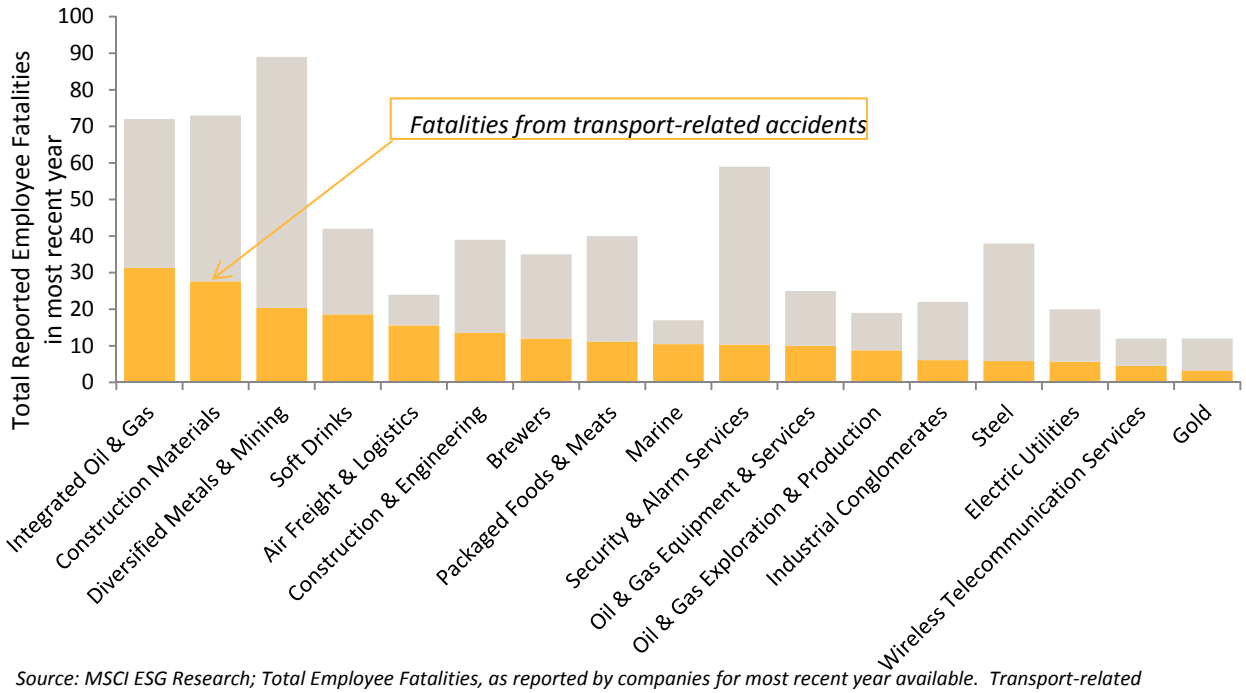
4. Weighing the Automation Revolution

Are there benefits for the less privileged in the coming technological advances?

Whether it's packages delivered by drones, self-driving cars, or robots greeting customers and stocking store shelves, there is much hand wringing over how the 'second machine age'[xx] could reconfigure our personal and work lives. Looking at the advent of artificial intelligence through the lens of ESG easily surfaces concerns from the death of privacy and dehumanized social interactions to labor market dislocation. However, there is an alternate subtext worth exploring as we enter a new "automated solution" reality, one that measures the balance of opportunities. We offer two such potential opportunities to consider: lives saved and new distribution for underserved niches.

Even as workplace fatalities continue to decline, some types of work will always carry inherent physical risks. Currently, among the most dangerous industrial jobs – based on MSCI ESG Research's analysis of data from the US Occupational Health & Safety Administration and the UK's RIDDOR database – are not just those in mining and steel, but those involving land transportation, including truck driving, taxi driving, and other people and courier transport. Greater automation in cars and trucks could have potential financial and social upside of reducing the risk of accidents for many distribution-intensive industries. Take companies in the global food and beverage industries - our ESG Ratings analysis indicates face high exposure to accidents but are not conventionally perceived to have dangerous working conditions. We estimate that nearly 50% of beverage sector employee fatalities in 2013 were related to transportation accidents. In fact, in the latest year of reporting, companies in the MSCI ACWI Index reported a total of at least 1760 employee fatalities in aggregate, of which we estimate over 500 occurred due to transport-related accidents[xxi] (see Figure 5).

Figure 5: Industries with the Highest Transport-Related Fatalities, MSCI ACWI (2014)



Source: MSCI ESG Research; Total Employee Fatalities, as reported by companies for most recent year available. Transport-related fatalities as a share of total fatalities is estimated based on OSHA statistics on causes of fatalities by industry.

Consider a second example: the delivery of healthcare services. Using MSCI ESG Research's analysis of risk exposure across 1,000+ business segments, we find that hospital, nursing, and related healthcare care services top the charts in terms of the most labor intensive business segments (as measured by dollars per employee). With rapidly aging populations in major developed markets, demand for healthcare could outpace the availability of caregivers. Japan, with the world's oldest population, has long recognized this eventual mismatch in labor supply and demand and has already taken a lead in pioneering the deployment of robotic and other computerized devices to assist in elder care. Companies such as Toyota and Panasonic are testing equipment that reduce the need for caregivers to physically carry and lift patients, and new government subsidies are spurring development of affordable 'care robots.' Although dystopian images abound of putting grandma in a robot's care, there is also the possibility that thoughtful deployment of technology could open access to more and better healthcare than might otherwise be possible in societies such as Germany and the UK with escalating old age dependency ratios.

Pundits the world over are fighting to coin new terms to characterize the fundamental changes underway in our economy and society. The optimists anoint the 'sharing economy' or the 'on demand economy'; the pessimists refer bleakly to our 'jobless future' or our 'automated future.' Whatever we call it, the next wave of technological advancements will no doubt trigger fierce public debate over the future direction of skills and employment, the structure of work and leisure, and the nature of our social relationships. Investors with a focus on long term value creation will need to evaluate not only the financial opportunities associated with these advances, but also weigh the unpredictable social consequences. While upheaval in labor markets will likely dominate media attention, we should not ignore the potential that vexing social problems – dangerous work and unequal access to essential services are merely two small examples – could benefit from the coming technology advancements.

5. Investing in the Infrastructure Gap

Where will infrastructure investments be most needed and least politically risky?

Years of fiscal austerity and under-investment have left key markets around the world with inadequate infrastructure to support long term economic growth or defend against extreme climate-related events. Private capital will increasingly be targeted as a source of potential funding, as government funds are likely insufficient for investment requirements estimated at more than USD 50 trillion by 2030[xxii]. In aggregate, institutional investors have played a minimal role thus far, with less than one percent of total assets allocated to infrastructure investments.

Funding the global 'infrastructure gap' is gaining urgency as key markets suffer increasing human and economic losses from climate-change related extreme weather events and projected sea level rise. Media and public attention to potential losses has often focused on the existential threat to poor island nations. Yet consider the vulnerability of our biggest economies:

- **Of the 20 countries that are projected to have the largest number of people living in areas at risk of flooding, six are Developed Markets including Germany, Japan and the US**; and nine are Emerging Markets, including some of the largest and fastest growing economies of the past decade such as Brazil, China, and South Korea.[xxiii]
- **45 percent of the properties held by REITs included in the MSCI ACWI Index[xxiv] are located in flood-prone regions**; 30 percent of MSCI ACWI REITs' properties are located in areas with a 10% chance of experiencing a Category 1 hurricane in the next ten years. (For detailed analysis of the exposure of fixed assets to floods and storm surges, see MSCI ESG Research's thematic report on *Storms and Rising Seas: Mapping the Climate Risk of Property and Power Generation Assets.*)

Furthermore, the scale of monetary losses is naturally far larger in developed markets. Countries such as Bangladesh and Haiti often suffer most in terms of number of lives lost to extreme weather events. Economically, however, five of the ten most costly weather events since 1970 occurred in the US, with Hurricane Katrina in the lead at an estimated loss of USD 147 billion and Hurricane Sandy in 2012 coming in second at USD 50 billion.[xxv]

For institutional investors seeking exposure to future infrastructure growth areas, where are potential opportunities to maximize social and economic impact, yet still minimize the political governance risks often associated with graft-prone, large-scale projects?

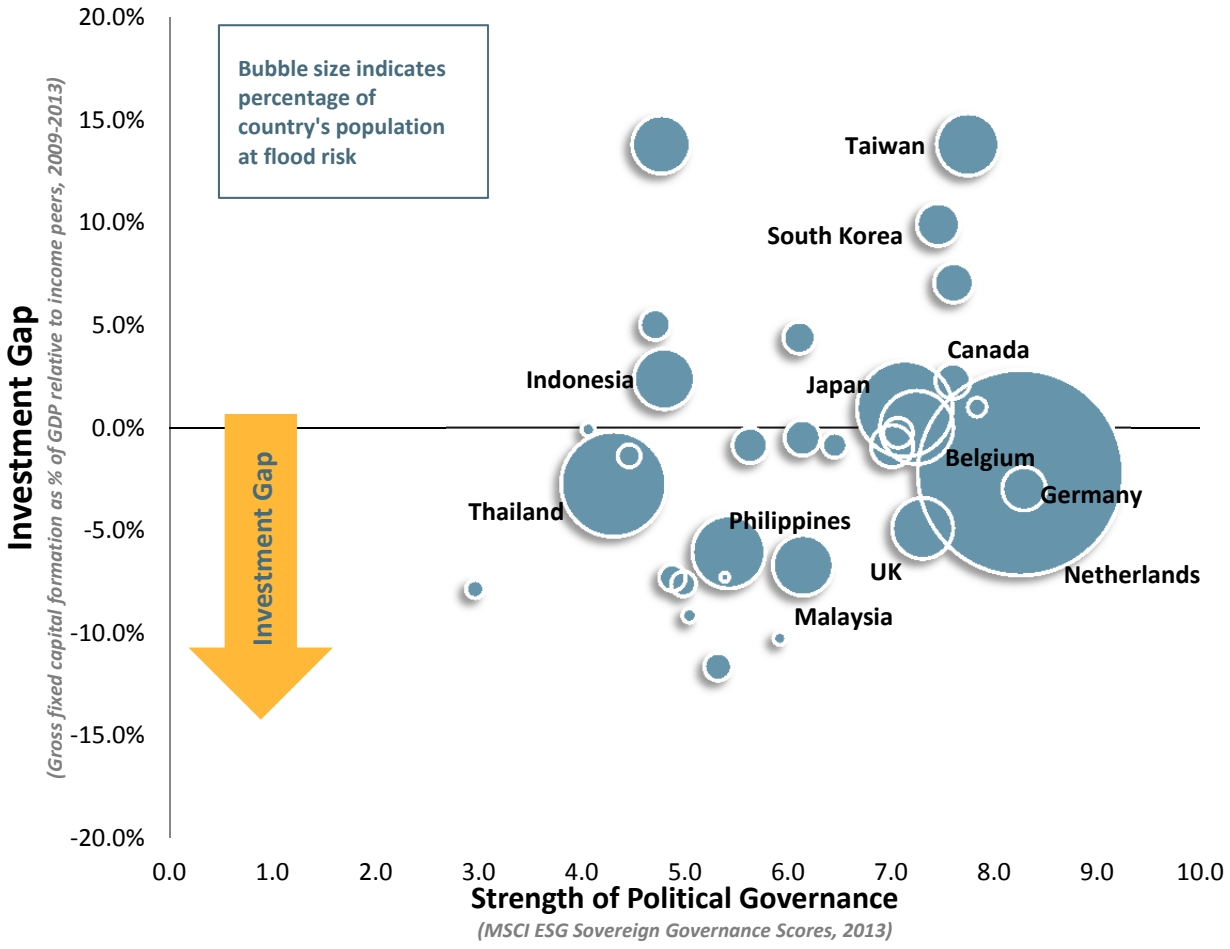
We analyzed countries represented in the MSCI ACWI Index – and hence meeting minimal criteria for investability[xxvi] -- along three criteria:

- Likelihood of requiring investments due to vulnerability of its population to climate change effects[xxvii];
- Status of fixed assets investment[xxviii] relative to peers of similar economic development[xxix]; and
- Fiscal and political governance standards.

We find that (see Figure 6):

- **In countries represented in the MSCI ACWI Index, an estimated 127 million people in aggregate are living in areas at risk of frequent flooding under the current trajectory of warming in the earth's temperature**[xxx]. 9 countries – including the UK, Netherlands, and Japan – risk having more than 4% of their population face chronic flooding.
- Among Emerging Markets, **Malaysia and Philippines will face increasing need to build climate-resilient physical infrastructure**, and both score in the middle range on their Governance risks among the 133 countries we rate.
- Among Developed Markets, the **top five European Union economies except for Spain all face potential vulnerabilities to flood risk** that require attention to climate adaptation investments.

Figure 6: The Investment Gap: Political governance risks for MSCI ACWI countries at risk of flooding



The key financial characteristics of infrastructure investments – higher income yield, stable quality cash flows, and lower market volatility that is less correlated with equities exposure – is gaining appeal in the shift toward alternative investments in the asset allocation process. We anticipate that as institutional investors increase allocation to this asset class, they will rely on an ESG lens to help target growth opportunities in building climate resilience and to minimize governance-related risks that currently present barriers especially for non-domestic infrastructure investments.

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[1] *As of June 30, 2014, as reported on September 30 2014 by eVestment, Morningstar and Bloomberg* *Nov 2014*

[i] For an example of leading institutional investors' efforts to identify carbon-related risks in their portfolio, see Local Authority Super's reporting on their carbon exposure: http://www.lgsuper.com.au/documents/Sustainability/Local%20Government%20Super%20ESG%20Carbon%20Risk%20Audit%20June2014.pdf

[ii] The options that investors are pursuing include allocations to carbon-tilt strategies, such as the United Nations Joint Staff Pension Fund's investments in two low carbon passive solutions tracking the MSCI ACWI Low Carbon Target Index and Fonds des Reserve pour les Retraites (FRR) and the Fourth Swedish National Pension Fund AP4's commitment of up to EUR 2 billion to low carbon investments tracking MSCI ACWI Low Carbon Leaders Index, and selective exclusions, such as the Stanford University endowment's divestment from companies deriving significant revenues from thermal coal extraction.

[iii] International Energy Agency. *International Energy Outlook 2013*.

[iv] International Energy Agency. *Renewable Energy Medium Term Market Report 2013*.

[v] The breakdown is roughly in line with IEA's 2015 projection of global installed capacity for coal and gas, but shows a much larger share from nuclear (versus IEA's 7%) and from hydro and other renewables (versus IEA's 30%).

[vi] International Energy Outlook. *Renewable Energy Medium Term Market Report 2014*.

[vii] The calculation assumes that generation capacity for coal, gas, liquids, and nuclear would increase at the same rate as the global growth rate for installed capacity of each fuel projected by the IEA between 2015 and 2020.

[viii] It is important to note the difference between installed generation capacity and net electrical generation. By 2020, while the IEA is projecting that total renewables will total roughly 33 percent of global power generation capacity versus coal at 30 percent, its projection for net electrical generation is for total renewables to generate 25 percent of electricity and still be surpassed by coal at 38 percent. The difference is due to the higher capacity utilization rates for coal-fired power plants than for renewables generation.

[ix] Data and analysis are as of November 2014.

[x] From November 2011 to November 2014. Data sourced from MSCI ESG Research's controversies research which categorizes and assesses the severity of ESG-related incidents that implicate a company as reported by media, government, and NGO sources.

[xi] The most notable industry study recently came from Credit Suisse: 'The CS Gender 3000: Women in Senior Management.'

[xii] Data and analysis are as of November 30, 2014.

[xiii] World Economic Forum. December 2014. *Impact Investing: A Primer for Family Offices.*

[xiv] Climate Bonds Initiative. 2014. *Bonds and Climate Changes: State of the Market in 2014.*

[xv] See Kepler Cheuvereux's research note 'Impact Investing' (November 2013) for an example of the methodology used to select small-cap equities with exposure to positive social impact.

[xvi] Data and analysis are as of November 2014.

[xvii] JP Morgan's survey of investors indicated that investor expectations for financial returns range from outperformance relative to traditional investments to expecting to make a financial 'trade-off' for social impact. See *Impact Investing: An Emerging Market Class*. JP Morgan Global Research, 29 November 2010.

[xviii] Paul Brest & Kelly Born. Fall 2013. 'When Can Impact Investing Create Real Impact?' *Stanford Social Innovation Review*.

[xix] Based on feedback from formal consultations with 30+ global investors, conducted jointly by MSCI ESG Research and Barclays, in July 2014 on the design of the Barclay MSCI Green Bonds Index.

[xx] Erik Brynjolfsson and Andrew McAfee. 2014. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies.* W. W. Norton & Company.

[xxi] Estimates based on applying OSHA's statistics on transportation-related accidents by industry.

[xxii] The OECD has estimated around USD 50 trillion from 2006 to 2030, while McKinsey has estimated USD 57 trillion from 2011 to 2030. See OECD (2006), *Infrastructure to 2030: Telecom, Land Transport, Water and Electricity*; and McKinsey Global Institute. 2013. *Infrastructure Productivity: How to Save 1 Trillion Dollars A Year.* Further, the International Energy Agency has projected that around USD 1 trillion a year is required to support climate mitigation and adaptation efforts. The IEA estimates that approximately half of the investment will involve replacing conventional technologies with low-carbon alternatives while the rest would constitute additional investment. See International Energy Agency (IEA), 2008, *Energy Technology Perspectives: Scenarios and Strategies to 2050.*

[xxiii] Based on data from Climate Central.

[xxiv] Data and analysis are as of November 2014.

[xxv] World Meteorological Organization (WMO). 2014. *The Atlas of Mortality and Economic Losses from Weather, Climate, and Water Extremes 1970-2012*. WMO-No. 1123.

[xxvi] The MSCI Market Classification Framework consists of the following three criteria: economic development, size and liquidity as well as market accessibility. For details on market classification, see http://www.msci.com/products/indexes/market_classification.htm

[xxvii] We measure population vulnerability using percentage of population at risk of flooding under the current trajectory of earth's warming. The data is sourced from Climate Central, with the methodology described here: http://www.climatecentral.org/news/new-analysis-global-exposure-to-sea-level-rise-flooding-18066

[xxviii] Few measures exist to compare the infrastructure gap across a large set of countries. McKinsey has estimated the value of infrastructure stock and the investment gap for a selection of countries. See McKinsey Global Institute. 2013. *Infrastructure Productivity: How to Save 1 Trillion Dollars A Year.*

As a rough proxy for investment levels relative to GDP and relative to peers of similar development status, we compare the gross fixed capital formation of these countries – a component of GDP that measures the net increase in physical assets -- relative to their peers by income bands. The World Bank's definition is: "Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings."

Using "net fixed capital formation", which takes asset depreciation into account , yields similar results with the exception of the US and Poland, which are very slightly above peer average when using net versus gross number.

In comparison, McKinsey's report notes that 'While the rule of thumb suggests China and Japan can reduce infrastructure investments from historical levels, most other countries will need to increase it,' including India which appears to have high gross fixed capital formation as a percentage of GDP but is assessed to face a large infrastructure gap.

[xxix] We use World Bank categories of High Income (Australia, Belgium, Canada, Chile, France, Germany, Greece, Italy, Japan, Netherlands, Poland, Russia, South Korea, Spain, Taiwan, United Kingdom, United States); Upper Middle Income (Argentina, Brazil, China, Colombia, Malaysia, Mexico, Peru, South Africa, Thailand, Turkey), and Lower Middle Income (Egypt, India, Indonesia, Philippines).

[xxx] Based on analysis from Climate Central: http://www.climatecentral.org/news/new-analysis-global-exposure-to-sea-level-rise-flooding-18066