

### Two reasons investors need to add ESG to their dashboard

It's not just for tree-huggers - incorporating environmental, social and corporate governance (ESG) considerations into one's framework is critical. First, these metrics have been strong indicators of future volatility, earnings risk, price declines and bankruptcies. Second, trends in the US investment landscape suggests that trillions of dollars could be allocated to ESG-oriented equity investments, to stocks that are attractive on these attributes, over the next few decades— inflows equivalent to the size of the S&P 500 today! In this first in a series of notes, we present our findings based on the Thomson Reuters ESG dataset, and conclude that ESG may be too costly to ignore.

### ESG could have helped investors avoid 90% of bankruptcies

Based on our analysis of companies with ESG scores that declared bankruptcy, an investor who only held stocks with above average-ranks on both Environmental and Social scores would have avoided 15 of the 17 bankruptcies we have seen since 2008.

### ESG has signaled future volatility & stock price declines...

Large companies within the highest quartile of the ESG framework tended to have consistently lower future price volatility than poorly ranked companies. Stocks with extreme price declines – over 90% - had average initial Environmental/Social scores in the 40<sup>th</sup> or lower percentiles. And the better a stock's score, the lesser the price decline.

### ...as well as earnings risk and return on equity

ESG scores have been strongly correlated with companies' future earnings volatility, both at a market level and within sectors. Moreover, companies with two or more *downgrades* on S&P Common Stock ranks (a gauge of earnings/dividend stability) had average Environmental and Social scores in the 40<sup>th</sup> percentile or lower (weak), whereas those with two or more *upgrades* had ranks in the 70<sup>th</sup> percentile or higher (strong). And companies that ranked well had, on average, a 5% higher subsequent return on total equity than did their poorly ranked counterparts.

### We are only in the early innings of a US ESG boom

Not only do ESG attributes appear to be good signals of future performance and risk, but growth in the US is just gathering momentum. Estimated assets under management (AUM) of traditional US-domiciled sustainable, responsible and impact investing (SRI) assets has grown to nearly \$9tn, an impressive 33% 2-year growth rate, but are still just one-fifth of assets. In Europe, ESG is part of the investment decision for 60% of AUM. As interest in ESG investing moves from specialists to generalists, areas for potential growth include:

**Pensions and Endowments:** Pensions and endowments are just beginning to rebalance into ESG-driven funds; but the establishment of the Sustainability Accounting Standards Board (SASB), a compliment to the well-known Financial Accounting Standards Board (FASB), will likely drive a move in ESG-type investing from specialists to generalists.

**Millennials:** Millennials have the highest proportion of assets deployed in ESG-oriented strategies of all age cohorts, but have the greatest interest in adding exposure to these strategies – 90% either engage in “impact investing” or want to. We estimate, using conservative assumptions, that this group alone could drive \$15-\$20tn of inflows over the next two to three decades, roughly doubling the size of the US equity market.

**Quants/Passive:** The popularity of factor-based passive investing has surged, and a search for untapped and uncorrelated factors is in full swing. But as of now, “principles-based” exchange traded funds (ETFs) make up less than 1% of total ETFs (ETF.com). Factor ETFs could be fertile ground for new product offerings based on ESG.

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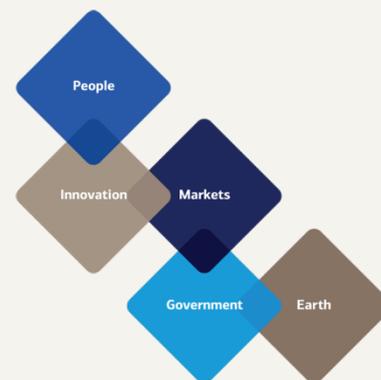
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### A Transforming World



# Introduction

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Values-based investing resonates at a human level — allocating capital to responsible companies with good governance feels like the right thing to do. But whether it enhances performance is less clear. Negative perceptions around the efficacy of ESG approaches may date back to the mid-70s where early attempts, branded as Socially Responsible Investing or SRI, primarily used negative screening—excluding “sin” stocks/industries from portfolios. The unintended consequence was a loss of diversification and fund concentration, which inhibited outperformance.

Academic research is split on whether ESG is a meaningful source of returns: a 2007 study<sup>1</sup> concluded that applying socially responsible criteria led to abnormally high returns, while another<sup>2</sup> found no difference between risk or return profiles of ESG portfolios and conventional funds. But interestingly, among fund managers who incorporate ESG factors, 80% cited better returns as one of the top reasons for incorporating ESG factors into their process according to a recent survey (US SIF 2016 Survey).

Here we examine ESG from the perspective of an equity investor, and conclude that ESG attributes may be too costly for investors to ignore. Our conclusions:

- ESG factors have been reasonable signaling tools for future performance, and companies with attractive ESG ratings have shown a tendency to re-rate as asset flows into these types of strategies have increased.
- ESG factors have been effective signaling tools for future stock price volatility and future drawdown risk.
- ESG factors have been effective signaling tools for future earnings volatility, future S&P quality rank upgrades/downgrades and future returns on total equity.
- Select ESG factors have had efficacy in signaling future bankruptcy risk.
- Most importantly, ESG-type investment strategies may be a self-fulfilling story. Our estimates suggest that ESG-type investment vehicles could double their asset base in the next one to two years, and could see exponential growth in the next one to two decades.

## Part I: good companies make good stocks

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A study of equity performance based on attributes should have some economic justification at the outset. When we assessed ESG factors and their ability to predict performance and volatility, our rationale was that ESG factors signal more than just a reason to feel good about investing in a company. Many of the factors included in the ranking system that we analyzed would seem to have economic ramifications. For example, emissions standards, part of the Environmental score, may predict the likelihood of fines and costly litigation. Innovation, which is included in the Social score, can lead to competitive advantages and barriers to entry. Training hours translate into a skilled workforce; employee satisfaction not only should enhance productivity but mitigates costly turnover—where these factors are incorporated into the Social score. At a deeper level, costly mistakes and bankruptcies often happen when corporations lack adequate checks and balances. The diversity of thought leadership at the top is one way to assess this risk, and leadership diversity is incorporated into the Governance score.

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<sup>1</sup> Kempf, Alexander, Osthof, Peer: The Effect of Socially Responsible Investing on Portfolio Performance, Centre for Financials Research (2007), CFR-Working Paper NO. 06-10.

<sup>2</sup> Bauer, Rob, Koedijk, Kees and Otten, Roger: International evidence on ethical mutual fund performance and investment style, Journal of Banking & Finance 29 (2005).

## ESG as a driver of returns

While academic research is split on the subject of whether ESG factors are superior predictors of returns, practitioners would claim they are. In a recent survey of fund managers who incorporate ESG factors, 80% cited better returns as one of the top reasons for incorporating ESG factors into their process (US SIF 2016 Survey).

**What we did:** Using the Thomson Reuters ESG dataset, we analyzed performance of companies' forward looking characteristics (returns, price volatility, earnings volatility etc.) based on the ranks assigned to companies, in some cases assessing the merits of each score individually or by calculating the average score. Please see the Appendix for a full methodology, and a more thorough discussion of the Thomson Reuters dataset.

**ESG translates into performance:** stocks that ranked within the top third by ESG scores relative to their peers would have outperformed stocks in the bottom third by about 18ppt from 2005 to today.

### ESG enhances returns even when adjusting for company size

Overall, we found that ESG factors enhanced rather than detracted from returns. But this performance was not consistent, and was very similar to the performance of large versus small companies. Given that ESG ranks are extremely correlated with size – larger companies tend to have higher ranks, and smaller companies tend to have lower ranks - we assessed performance controlling for size. Here we found that for the most part, performance spreads would have been positive based on a long-short strategy using Environmental and Social and combined ESG ranks, but performance based on Governance scores was not as consistent.

**Table 1: Size-adjusted forward performance spread (Q1 – Q5\*) by ESG ratings, 2005 to 2015, BofAML US coverage universe with ESG ratings**

	Q1 (Largest)	Q2	Q3	Q4 (Smallest)
Environmental Score	3.3	4.1	2.0	1.8
Social Score	0.3	7.1	2.0	3.8
Corporate Governance Score	-1.3	3.1	2.0	-1.3
Overall	1.1	4.7	4.0	2.9

Source: Thomson Reuters, BofAML Global Research

\* Quintile 1 includes companies with strong ranks, within the highest quintile by ESG score, Quintile 5 includes companies with weak ranks, within the lowest quintile by overall ESG score

**Chart 1: Relative Performance: Highest third of universe vs. lowest third of universe by ESG scores**

2005 to 2015, based on BofAML coverage universe with ESG ranks available



Source: Thomson Reuters, BofAML Global Research

Within sectors, we found that alpha was far less stable, suggesting that an investment strategy based on ESG data would likely be enhanced by creating sector specific models or using alternate approaches for sectors with negative results. Sectors with perverse results (opposite results to what we would have expected) included Health Care, Technology, and Consumer Staples. One common feature among these sectors is their more global exposure, and their higher levels of idiosyncratic (or stock specific) risk than that of other sectors. A topic for future research would be to determine a more effective way to assess ESG risks within these sectors.

**Table 2: Sector-specific annualized forward performance spread (Q1-Q5\*), 2005 to 2015, BofAML US coverage universe with ESG ratings**

	Discretionary	Staples	Energy	Financials	Health Care	Industrials	Info. Tech.	Materials	Real Estate	Utilities
Environmental Score	3.6	-1.1	9.0	-7.1	-2.1	-0.3	-2.2	0.3	8.1	2.0
Social Score	2.5	-7.2	11.2	1.9	-0.2	-2.6	-2.4	6.3	2.3	0.1
Corporate Governance Score	-2.2	-4.7	1.4	3.4	-5.2	0.6	-2.8	-5.3	-2.8	4.7
Overall	-1.2	-6.8	10.6	-1.2	-3.8	0.0	-0.7	-4.2	0.0	1.3

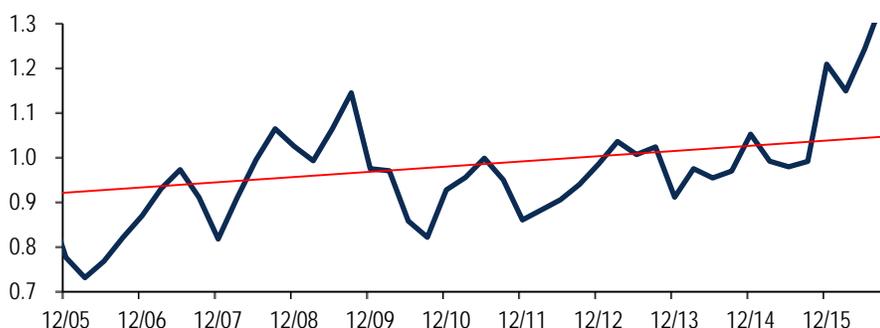
Source: Thomson Reuters, BofAML Global Research

\* Quintile 1 includes companies with strong ranks, within the highest quintile by ESG score, Quintile 5 includes companies with weak ranks, within the lowest quintile by overall ESG score

## A multiple re-rating may be in the works

Possibly driven by asset flows into these types of vehicles, on at least one valuation metric, EV/EBITDA, a re-rating of companies based on their ESG scores has been taking place over time, and more dramatically in recent years. Chart 2 below depicts the relative Enterprise Value/EBITDA ratio for companies within the highest versus lowest decile by overall ESG score (the average of the three pillars' scores.) High ranked companies appear to have re-rated relative to low ranked companies, especially in recent years.

**Chart 2: Median EV/EBITDA: of high vs. low ESG deciles based on overall ESG scores 4Q05-3Q16**



Note: based on deciles of BofAML US coverage universe for which Thomson Reuters ESG data are available

Source: Thomson Reuters, FactSet, BofA Merrill Lynch US Equity & US Quant Strategy

## ESG as a signal of future risk

In general, we found that if investors defaulted to owning companies within the top quintile by ESG ranks, they would have generally enjoyed lower price volatility and less extreme price declines within their portfolios, all else equal. If investors had limited their holdings to companies with above average ranks on Environmental and Social scores, they would have avoided most of the companies that filed for bankruptcy over the subsequent five years.

### Price volatility

As a signal of future price volatility, ESG scores appeared to be quite effective within larger stocks, moderately effective within mid-size stocks, but tapered off in efficacy within the smallest quintile. That said, within sectors, ESG factors appeared to provide good signaling of future volatility, with the exception of Financials, possibly due to the fact that the period we examined included the Global Financial Crisis.

**Table 3: Size adjusted price volatility spread over the next five years by ESG Quintile (difference Q5 – Q1\*), 2005 to 2015, rolling 5-year periods (positive numbers indicate that poor ranks result in higher volatility)**

Factor	Q1 Largest Mkt Cap	Q2	Q3	Q4 Smallest Mkt Cap
Environmental Score	11.4	3.5	0.1	-2.0
Social Score	7.9	0.6	0.5	1.6
Corporate Governance Score	9.7	4.1	1.0	-3.7
Overall	9.4	3.9	1.4	-2.6

Source: Thomson Reuters, BofAML US Equity & Quant Strategy

\* Quintile 5 includes companies with weak ranks, within the lowest quintile by overall ESG score; Quintile 1 includes companies with strong ranks, within the highest quintile by ESG score

**Table 4: Size adjusted price volatility spread over the next five years by ESG Quintile (difference Q5 – Q1), 2005 to 2015, rolling 5-year periods**

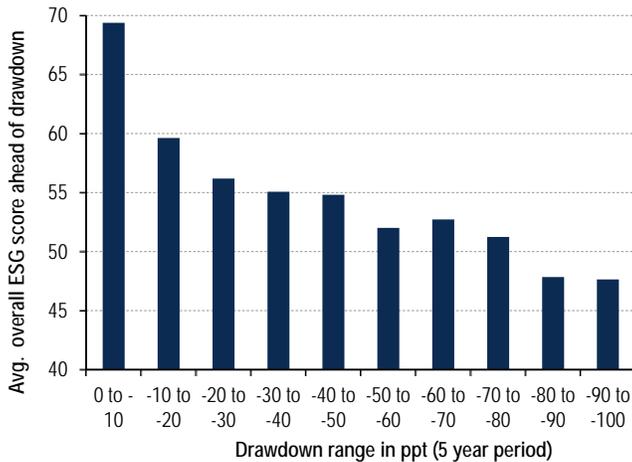
	Consumer Discretionary	Consumer Staples	Energy	Financials	Health Care	Industrials	Info. Tech	Materials	Real Estate	Utilities
Environmental Score	5.3	13.3	8.2	-0.2	6.3	6.1	-0.3	2.2	0.6	5.8
Social Score	11.1	15.7	11.8	-11.3	9.1	1.8	4.8	12.3	4.6	5.9
Corporate Governance Score	9.0	9.3	5.5	-5.5	6.1	6.8	-0.3	-3.2	16.8	4.3
Overall	8.6	15.5	9.5	-10.0	8.6	5.6	2.3	9.5	0.7	6.0

Source: Thomson Reuters, BofAML US Equity & Quant Strategy

### Peak to trough price declines

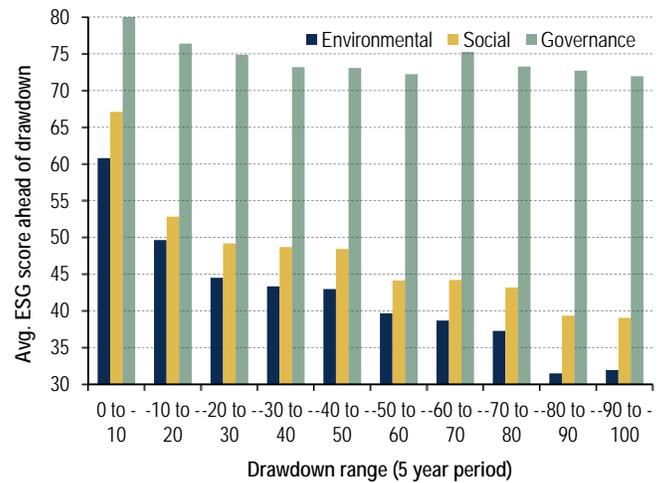
As a signal of significant future price declines, ESG scores again appear to be quite effective, with the exception of Corporate Governance ranks where results suggested scant information content (Chart 4). Overall, we found that stocks with minimal peak to trough declines or drawdowns over the subsequent five years had an average score of close to the 70<sup>th</sup> percentile ahead of the period analyzed, whereas those with extreme declines (over 90ppt) had an average score in the 47<sup>th</sup> percentile ahead of the decline. Encouragingly, results were monotonic: the weaker the stock's score, the greater the subsequent price decline.

**Chart 3: Avg. overall ESG score\* of ahead of price declines, grouped by maximum peak to trough price decline over a 5-yr period (from 2005-2015)**



\*Based on average of Environmental, Social and Governance scores applied to the universe of ESG-ranked stocks in the BofAML US coverage universe  
Source: Thomson Reuters, BofA Merrill Lynch Global Research

**Chart 4: Avg. Environmental, Social and Governance ESG scores of ESG-ranked stocks in BofAML US coverage universe ahead of price declines, grouped by maximum peak to trough price decline over a 5-yr period (from 2005-2015)**



Source: Thomson Reuters, BofA Merrill Lynch Global Research

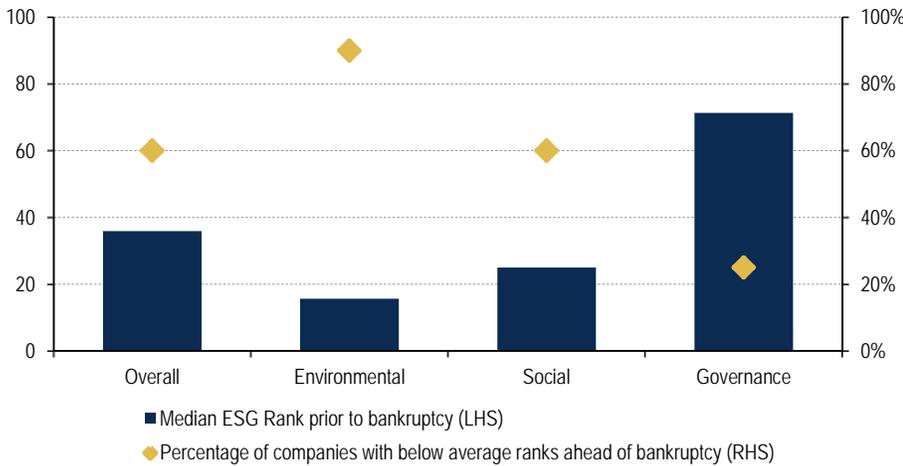
## Bankruptcy risk

Within the time period of our analysis, seventeen companies within our universe that were ranked on ESG scores at least five years earlier filed for bankruptcy. If an investor had observed ESG scores of stocks five years prior to the bankruptcy, and only bought stocks with above average scores on Environmental and Social metrics, the investor would have avoided fifteen of the seventeen companies that filed for bankruptcy.

Moreover, the average ESG scores one year prior to the date that the company filed for bankruptcy were quite low (sub-40) driven by effective forecasting from the Environmental and Social scores; again, similar to price decline risk, Corporate Governance was not a particularly effective forecasting tool for bankruptcy likelihood (Chart 5). A topic for future research would be to explore the generally weaker results in this dataset for the governance score, and identify a superior method for assessing corporate governance as a tool for forecasting volatility, price decline risk and bankruptcy risk.

### Chart 5: Environmental and Social ranks have been good signals of future bankruptcy risk

ESG ranks one year prior to bankruptcy of US stocks that filed for bankruptcy between 2008-2015



Note: Overall ESG rank based on average of Environmental, Social and Governance scores. Sample is based on 20 US companies in BofAML US universe with ESG ranks that filed for bankruptcy between 2008-2015

Source: Thomson Reuters , BofA Merrill Lynch Global Research

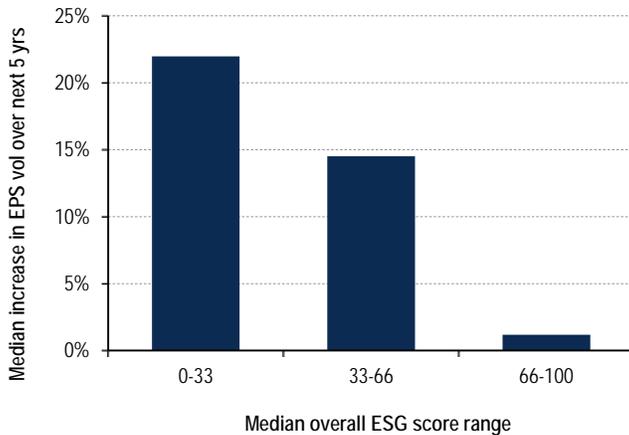
## ESG as signal of earnings attributes

### Earnings volatility

ESG scores appear to be effective at a broad level in signaling deteriorating earnings volatility, where we assessed this using two measures –the change in actual EPS volatility over the subsequent 5 years (Chart 6), and the change in Standard & Poor Common Stock rankings, which measures historical earnings and dividend volatility, over the subsequent five years (Chart 7).

#### Chart 6: Stocks with lower ESG scores have tended to see EPS volatility pick up more than stocks with higher ESG scores

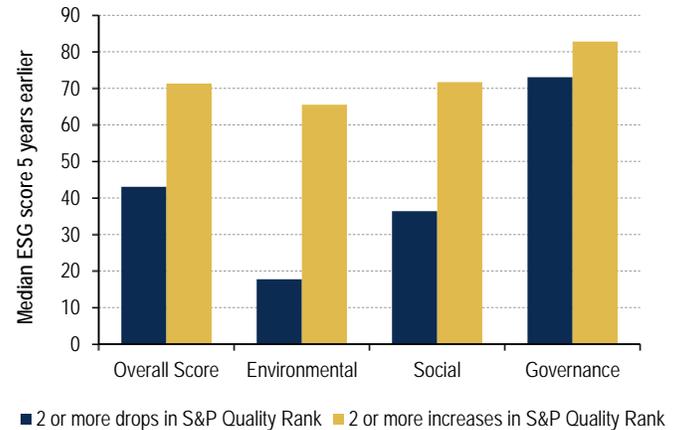
Median increase in EPS volatility over the subsequent five years based on median ESG score\* at start of period (2005-2015)



\*Based on average of Environmental, Social and Governance scores applied to the universe of ESG-ranked stocks in the BofAML US coverage universe  
Source: Thomson Reuters, BofA Merrill Lynch Global Research

#### Chart 7: Stocks which saw two or more drops in their S&P Quality Rank were preceded by weaker ESG scores 5 years prior than stocks which saw two more increases in their S&P Quality Rank

Median ESG scores of stocks based on subsequent S&P Quality rank chgs, 2005-2015



Note: Based on universe of ESG-ranked stocks in the BofAML US coverage universe, with overall score the average of the Environmental, Social and Governance scores  
Note: Source: Thomson Reuters, BofA Merrill Lynch Global Research

## Return on Total Equity

As a predictor of return on total equity (ROTE), ESG scores appeared to be quite effective. Within each market capitalization quartile, better ranked stocks systematically had higher future ROEs than their lower ranked counterparts – an average spread of almost 5ppt (Chart 7).

#### Table 5: Size adjusted Return on Total Equity spread by ESG quintiles (difference Q1 – Q5\*) rolling 5-year periods

ROE	Q1	Q2	Q3	Q4
Environmental Score	7.8	5.2	3.9	3.9
Social Score	6.4	6.3	4.6	6.2
Corporate Governance Score	6.4	2.1	2.5	0.2
Overall	7.3	5.9	4.7	4.8

Source: BofA Merrill Lynch Global Research

Quintile 1 includes companies with strong ranks, within the highest quintile by ESG score, Quintile 5 includes companies with weak ranks, within the lowest quintile by overall ESG score

## Part II: A self-fulfilling prophecy

We see significant potential for asset growth within the US ESG investment landscape. The next generation of individual investors cares deeply about aligning their investments with their values. Institutional investors are beginning to care about ESG factors, but only a quarter of endowment funds currently invest in ESG type vehicles according to the 2014 Commonfund Study of Responsible Investing. Corporate America has responded to this growing investor interest – over 80% of S&P 500 companies have issued publications highlighting their ESG characteristics according to the Governance & Accountability Institute. Regulators are pushing for a formal adoption of ESG into corporate and investor protocol, and the advent of SASB (details below) suggests that this theme is quickly moving into the mainstream.

Flows into ESG funds are gaining momentum in the US, but are likely in the early innings. Factor-based ETFs are proliferating as investors seek uncorrelated sources of alpha in low-cost packaging, and ESG data sources clearly lend themselves to this endeavor. We see significant potential for asset growth within the US ESG investment landscape.

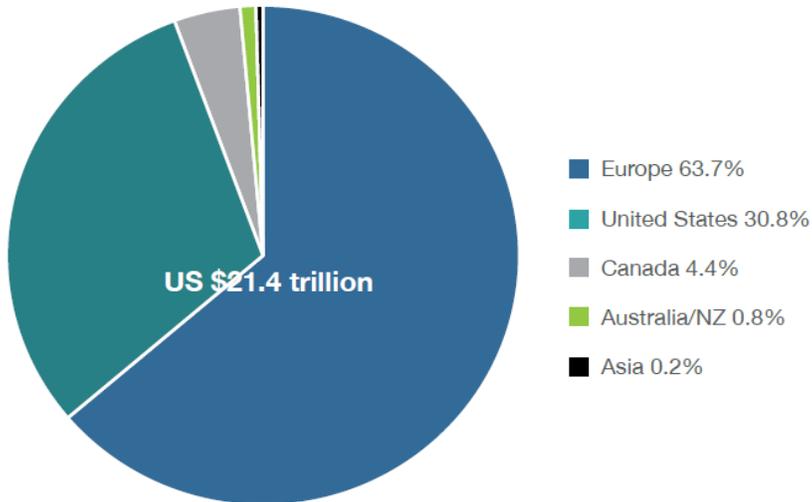
Future capital is likely be allocated to companies that rank well according to ESG criteria: we see high likelihood of outsized ESG-type fund inflows, suggesting that for technical reasons alone, good companies could make for good stocks as this rotation takes place.

### The US is in its early innings of growth with respect to ESG

According to US SIF (The Forum for Sustainable and Responsible Investing)'s Report on US Sustainable, Responsible and Impact Investing Trends 2016, the AUM of US-domiciled Socially Responsible Investment (SRI) strategies has grown 33% over the past two years, from \$6.57tn at the beginning of 2014 to \$8.72tn at the start of 2016 (see exhibit below)—and by nearly 14x since 1995 (13% CAGR). The nearly \$9tn of SRI investments represents ~22% of the \$40.3tn in total AUM tracked by research and analytics firm Cerulli Associates. According to the same report, both the number of funds and AUM of funds incorporating ESG-type considerations have grown substantially over the past two decades (Chart 8). While values based investing is currently a bigger focus in Europe, where it is an investment consideration in over 60% of managed assets according to a 2014 report by the Sustainable Investment Alliance – see exhibit below) the US has been growing at the fastest pace. The landscape in Europe represents what the US could get to over time.

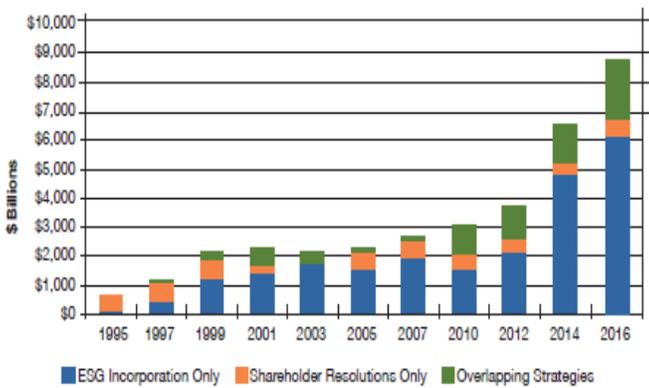
Applying recent growth rates to the estimated \$8.7tn currently invested in ESG strategies in the US implies almost \$3 trillion of asset inflows over the next twelve months, and assets potentially doubling by the end of 2018.

**Exhibit 1: Proportion of global SRI assets by region (2014)**



Source: Global Sustainable Investment Alliance (2014 Global Sustainable Investment Review)

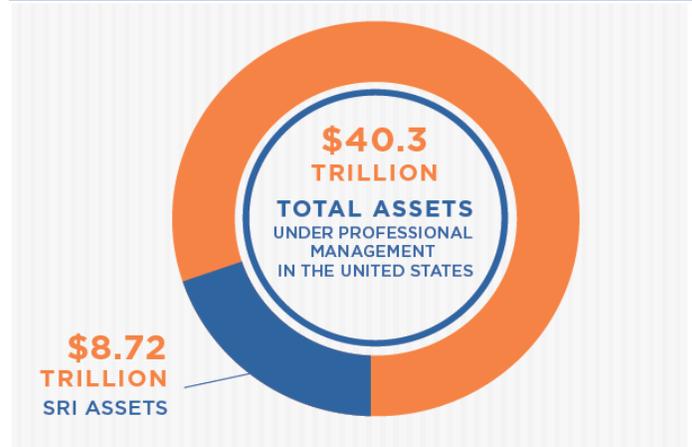
**Exhibit 2: Sustainable, Responsible and Impact Investing Trends in the US, 1995-2016**



Source: US SIF Foundation

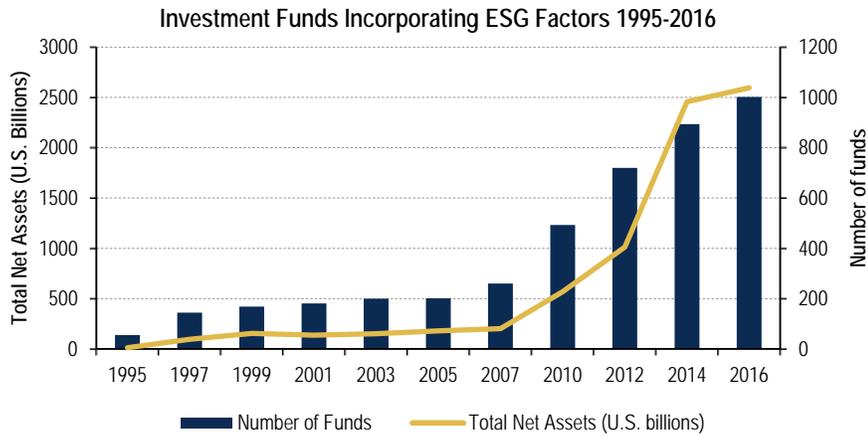
Note: Based on a survey by US SIF of 1) 477 institutional investors, 300 money managers and 1043 community investment institutions that apply ESG criteria in investment analysis/portfolio selection, and 2) institutional investors or money managers that filed/co-filed shareholder resolutions on ESG issues at publicly traded companies from 2014-2016, eliminating double counting of assets between the two samples

**Exhibit 3: Size of Sustainable, Responsible and Impact (SRI) Investing, 2016**



Source: US SIF Foundation, Cerulli Associates

**Chart 8: Investment funds incorporating ESG factors, 1995-2016**



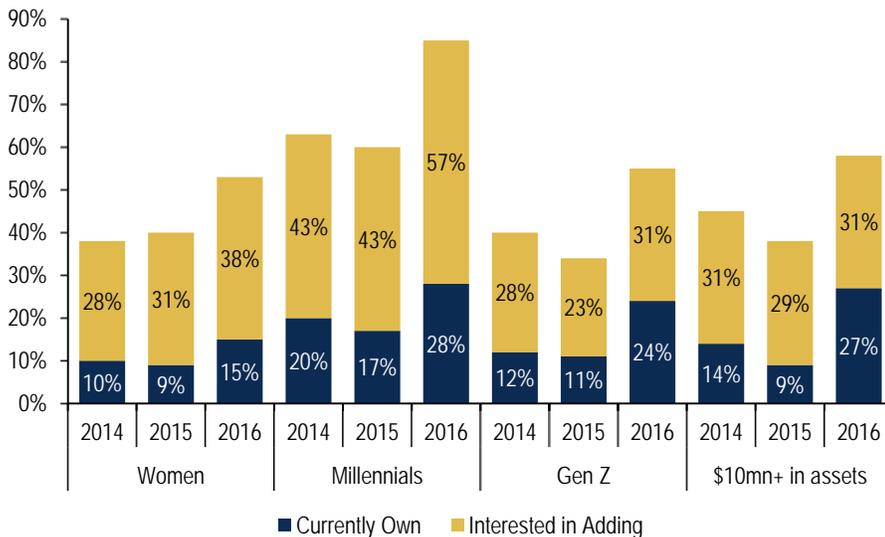
Source: US SIF Foundation

NOTE: ESG funds include mutual funds, variable annuity funds, closed-end funds, exchange-traded funds, alternative investment funds and other pooled products, but exclude separate accounts, Other/Not Listed, and community investing institutions. From 1995-2012, separate account assets were included in this data series, but have been excluded since 2014, in order to focus exclusively on commingled investment products.

### Millennials have the potential to drive exponential growth

Among the 18-29 year-old cohort, 93% consider “impact investing” (i.e., ESG, thematic and “impact first” solutions) an important part of investing, and 85% say their investment decisions are a way to express their social, political and environmental values, according to the 2016 U.S. Trust Wealth and Worth Survey. In fact, the same survey finds that millennials are 1.5 times more likely than older generations to believe that market-rate returns are possible through “impact investing”. And they are already well on their way: Millennials have the highest percentage of assets deployed in “impact investing” out of all cohorts surveyed.

**Chart 9: Momentum building for Impact Investing in bellwether demographic segments**



Source: 2016 U.S. Trust Wealth and Worth Survey

What kind of growth can Millennials drive? Assuming an increase in wealth in the US of around \$4tn per decade, as well as the transfer of wealth beginning in the late 2020s of \$30-40 trillion of financial and non-financial assets, inflows could become parabolic. Given that 85% of Millennials either own or are interested in adding exposure to “impact investing” vehicles, assuming that a conservative 30-40% of their wealth

increase is invested in equity ESG funds, this equates to \$15 to \$20tn of asset inflows over the next two to three decades.

Using conservative estimates, Millennials could drive \$15 to \$20tn of asset inflows into ESG type strategies over the next two to three decades. This amount represents the current market capitalization of all S&P 500 companies (\$19.5tn)

### Not just Millennials care...

Millennials aren't the only generation interested in impact investing. According to the U.S. Trust survey, among wealthy individuals and families, more than half surveyed said that social impact investing is "the right thing to do." In addition, 47% say they want to make a positive impact on the world and that corporate America should be accountable for its actions.

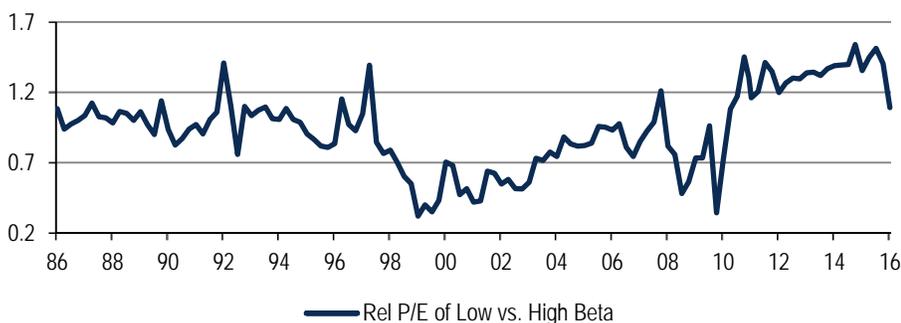
### Pension funds have just begun to rebalance into ESG

Institutional managers are increasingly considering ESG factors. For example, the California State Public Employee Retirement System (CalPERS) recently issued a statement that it would evaluate all managers along ESG lines. But there could be much more to go: a 2014 survey by the Commonfund Institute of 200 university endowments revealed that just 53 are "actively engaged in responsible investing," with just 17 having formally incorporated ESG criteria.

A case study of how fund flows can drive returns is shown below, where low beta stocks re-rated from 12.5x earnings in 2009 to 19x earnings in 2016 amid the building interest in "Low Vol" strategies.

**Chart 10: Inflows into low volatility funds created extreme levels of valuation**

Next Year Est. Relative P/E by S&P 500 Low Beta vs. High Beta Quintiles, 1986-11/2016



Source: BofAML Global Research

## Corporate America has responded

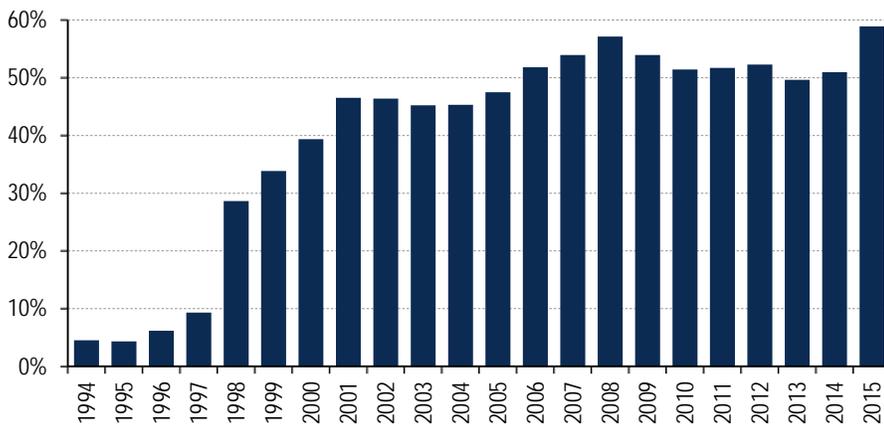
The rise in importance of ESG factors has not been lost on the corporate sector. According to a 2015 report from the Governance & Accountability Institute, 81% of the S&P 500 companies published a sustainability or corporate responsibility report last year, compared to less than 20% in 2011. Moreover, the Principles for Responsible Investment (PRI) has asked the Department of Labor to examine its definition of fiduciary duty to incorporate these concepts. The establishment of the Sustainability Accounting Standards Board (SASB) in 2010 is also an important milestone, where this committee, a cousin to the Financial Accounting Standards board, sets industry-specific standards for corporate sustainability disclosure, with a view towards ensuring that

disclosure is material, comparable, and decision-useful for investors. The establishment of the SASB, and the potential adoption of these standards by regulators, could move ESG from the sphere of specialists into the mainstream.

### ESG may be even more important as assets grow less transparent

According to a Merrill Lynch Wealth Management Institute white paper from November 2015<sup>3</sup>, there is a growing percentage of intangible assets within the S&P 500 which could naturally increase the utility of ESG attributes. Based on S&P 500 and Compustat data, we estimate that intangible assets as a percentage of S&P 500 book value has grown from less than 10% in the mid-1990's to nearly 60% today, where intangible assets like brand equity and reputation are far more difficult to value than tangible assets (plant, equipment.) The increasing opacity of US companies' asset bases suggests that a non-fundamental evaluative framework is paramount.

**Chart 11: Intangibles as a percent of S&P 500 book value, 1994-2015**



Source: FactSet, BofA Merrill Lynch Global Research

### ESG could benefit from quant & passive investment trends

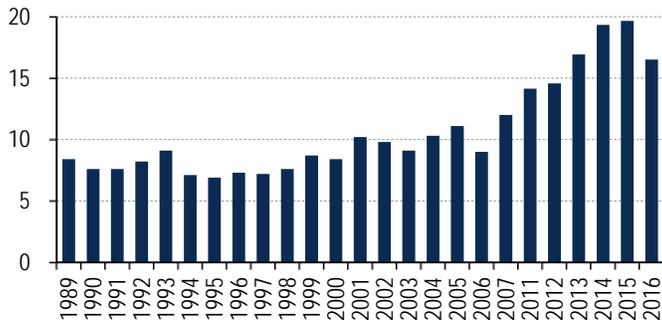
Quantitatively oriented investors are always on the lookout for new, untapped and uncorrelated factors, and have expanded their toolkit to include three times the number of signals they used twenty years ago (Chart 12). The popularity of factor investing has surged, possibly to the detriment of fundamental investing (Chart 13). With the availability of ESG datasets, one can easily imagine a proliferation of ESG-driven factor exchange-traded funds (ETFs), creating low cost access to values based investing.

We are still most likely in the early innings of a shift from active to passive strategies (Chart 14). And within passive funds, we found only 23 “principles-based” ETFs, which make up less than 1% of total assets under management in ETFs according to analysis by ETF.com. Factor based ETFs may become a bigger player if this shift toward values based investing and from active to passive funds continues.

<sup>3</sup> Snider, Anna, “Impact investing: the performance realities”, Merrill Lynch Wealth Management Institute, November 2015

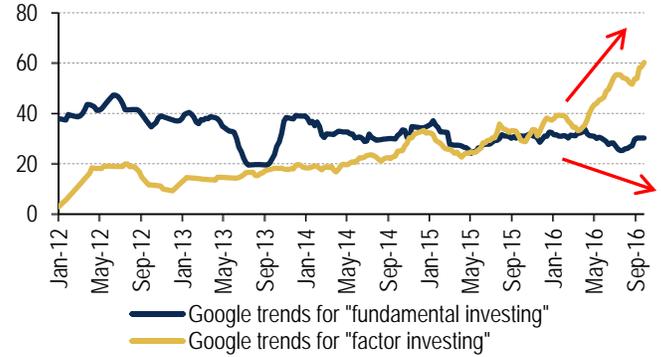
**Chart 12: BofAML Institutional Factor Survey: average number of factors used by investors over time**

Based on surveys from 1989 to 2016



Note: 2008-2010 excluded (insufficient responses)  
Source: BofA Merrill Lynch Global Research

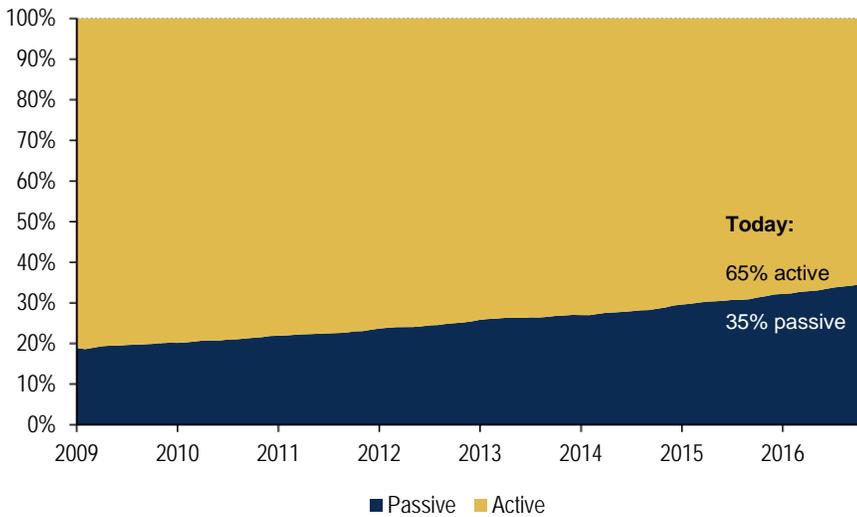
**Chart 13: Google search trends: factor investing versus fundamental investing (15 week average), 2012-9/25/16**



Source: Google

**Chart 14: Active to passive rotation could still be in the early innings**

AUM split of US funds: active vs. passive, 2009-11/2016

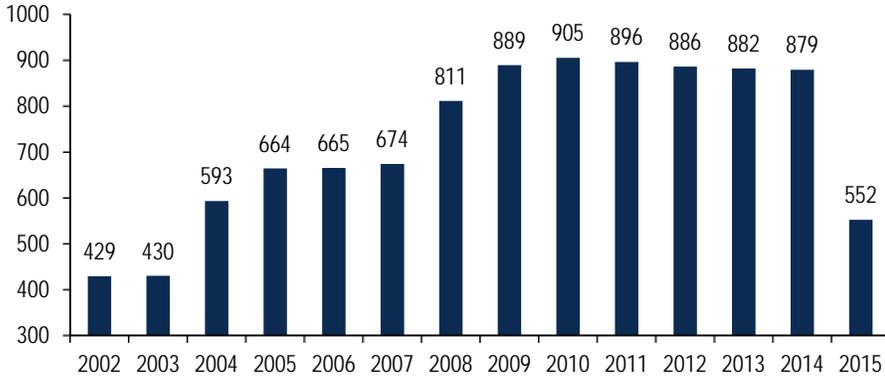


Source: Strategic Insight SimFund, BofA Merrill Lynch Global Research

# Methodology

In the report we used data provided by Thomson Reuters as applied to the BofA Merrill Lynch US Research coverage universe, spanning the period from 2002 to 2015. Given the relative sparseness of data prior to 2005, we restricted most analyses to the period spanning 2005 to today (Chart 15).

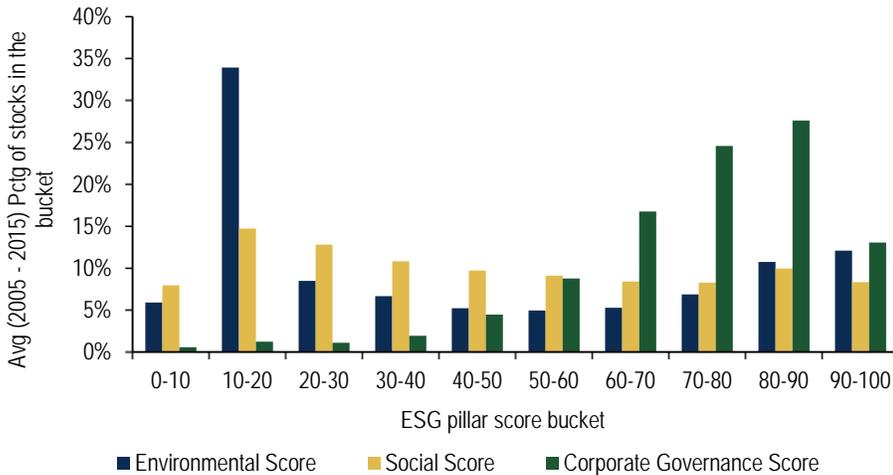
**Chart 15: Thomson-Reuters data: number of BofAML covered companies with ESG scores**



Source: Thomson Reuters, BofAML Global Research

One pitfall that we observed in the dataset was an irregular distribution of ranks, which may have contributed to the lack of consistent monotonic results for some factors, as shown in the chart below.

**Chart 16: Distribution of ESG ratings (2005 – 2015)**



Source: Thomson Reuters

The Thomson dataset is broken into four broad categories or pillars: Corporate Governance, Economic, Environmental and Social (Table 6). Note that we excluded the Economic pillar from this analysis as our focus was on non-economic measures of corporate health. Thus, for our purposes, the “Overall” rank that we highlight in various exhibits within this research report is based on an equal weighted average of the Environmental, Social and Governance pillars, and not Thomson’s equal-weighted ranking of all four pillars that is included in the table below. For more on Thomson’s ESG rating methodology, please see “Thomson Reuters Corporate Responsibility Ratings (TRCRR): Ranking Rules and Methodologies” (<http://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/tr-com-financial/methodology/corporate-responsibility-ratings.pdf>).

**Table 6: Thomson-Reuters ESG Factors Pillars**

Pillar	Definition
Economic	The economic pillar measures a company's capacity to generate sustainable growth and a high return on investment through the efficient use of all its resources. It is reflection of a company's overall financial health and its ability to generate long term shareholder value through its use of best management practices.
Social	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
Corporate Governance	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.
Environmental	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
Equal-Weighted Rating	The Equal Weighted Rating reflects a balanced view of a company's performance in all four areas, economic, environmental, social and corporate governance. Note that we did not use this as our "overall" rank, and instead calculated the equal-rank of each company using the Environmental Social and Governance ranks.

Source: Thomson Reuters

Each pillar relies on underlying factors (Table 7).

**Table 7: Thomson-Reuters ESG Factors Hierarchy**

ESG Factor	Pillar	Definition	Hierarchy Level
Environmental Score	Environmental	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.	1
Emission Reduction	Environmental	The emission reduction category measures a company's management commitment and effectiveness towards reducing environmental emission in the production and operational processes. It reflects a company's capacity to reduce air emissions (greenhouse gases, F-gases, ozone-depleting substances, NOx and SOx, etc.), waste, hazardous waste, water discharges, spills or its impacts on biodiversity and to partner with environmental organisations to reduce the environmental impact of the company in the local or broader community.	2
Product Innovation	Environmental	The product innovation category measures a company's management commitment and effectiveness towards supporting the research and development of eco-efficient products or services. It reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed, dematerialized products with extended durability.	2
Resource Reduction	Environmental	The resource reduction category measures a company's management commitment and effectiveness towards achieving an efficient use of natural resources in the production process. It reflects a company's capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.	2
Social Score	Social	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.	1
Customer /Product Responsibility	Social	The customer/product responsibility category measures a company's management commitment and effectiveness towards creating value-added products and services upholding the customer's security. It reflects a company's capacity to maintain its license to operate by producing quality goods and services integrating the customer's health and safety, and preserving its integrity and privacy also through accurate product information and labelling.	2
Society /Community	Social	The society/community category measures a company's management commitment and effectiveness towards maintaining the company's reputation within the general community (local, national and global). It reflects a company's capacity to maintain its license to operate by being a good citizen (donations of cash, goods or staff time, etc.), protecting public health (avoidance of industrial accidents, etc.) and respecting business ethics (avoiding bribery and corruption, etc.).	2
Society /Human Rights	Social	The society/human rights category measures a company's management commitment and effectiveness towards respecting the fundamental human rights conventions. It reflects a company's capacity to maintain its license to operate by guaranteeing the	2

**Table 7: Thomson-Reuters ESG Factors Hierarchy**

ESG Factor	Pillar	Definition	Hierarchy Level
Workforce /Diversity and Opportunity	Social	freedom of association and excluding child, forced or compulsory labour. The workforce/diversity and opportunity category measures a company's management commitment and effectiveness towards maintaining diversity and equal opportunities in its workforce. It reflects a company's capacity to increase its workforce loyalty and productivity by promoting an effective life-work balance, a family friendly environment and equal opportunities regardless of gender, age, ethnicity, religion or sexual orientation.	2
Workforce /Employment Quality	Social	The workforce/employment quality category measures a company's management commitment and effectiveness towards providing high-quality employment benefits and job conditions. It reflects a company's capacity to increase its workforce loyalty and productivity by distributing rewarding and fair employment benefits, and by focusing on long-term employment growth and stability by promoting from within, avoiding lay-offs and maintaining relations with trade unions.	2
Workforce /Health & Safety	Social	The workforce/health & safety category measures a company's management commitment and effectiveness towards providing a healthy and safe workplace. It reflects a company's capacity to increase its workforce loyalty and productivity by integrating into its day-to-day operations a concern for the physical and mental health, well-being and stress level of all employees.	2
Workforce /Training and Development	Social	The workforce/training and development category measures a company's management commitment and effectiveness towards providing training and development (education) for its workforce. It reflects a company's capacity to increase its intellectual capital, workforce loyalty and productivity by developing the workforce's skills, competences, employability and careers in an entrepreneurial environment.	2
Corporate Governance Score	Corporate Governance	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.	1
Board of Directors/Board Functions	Corporate Governance	The board of directors/board functions category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to board activities and functions. It reflects a company's capacity to have an effective board by setting up the essential board committees with allocated tasks and responsibilities.	2
Board of Directors/Board Structure	Corporate Governance	The board of directors/board structure category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to a well balanced membership of the board. It reflects a company's capacity to ensure a critical exchange of ideas and an independent decision-making process through an experienced, diverse and independent board.	2
Board of Directors/Compensation Policy	Corporate Governance	The board of directors/compensation policy category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to competitive and proportionate management compensation. It reflects a company's capacity to attract and retain executives and board members with the necessary skills by linking their compensation to individual or company-wide financial or extra-financial targets.	2
Integration/Vision and Strategy	Corporate Governance	The integration/vision and strategy category measures a company's management commitment and effectiveness towards the creation of an overarching vision and strategy integrating financial and extra-financial aspects. It reflects a company's capacity to convincingly show and communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes.	2
Shareholders /Shareholder Rights	Corporate Governance	The shareholders/shareholder rights category measures a company's management commitment and effectiveness towards following best practice corporate governance principles related to a shareholder policy and equal treatment of shareholders. It reflects a company's capacity to be attractive to minority shareholders by ensuring them equal rights and privileges and by limiting the use of anti-takeover devices.	2

Source: Thomson Reuters

## The Universe

The universe of companies used in the study consists of the BofAML US coverage universe each year for which Thomson Reuters ESG data are available.

## Market Capitalization analysis methodology

Using market capitalization data at the beginning of each period, we divided the universe into quartiles (or fourths), with Quartile 1 corresponding to the largest

companies and Quartile 4 corresponding to the smallest companies by market capitalization at that point in time. Within these quartiles, we divided companies into quintiles according to their individual and overall ESG scores and then measured forward performance, volatility, fundamental metrics, etc.

### Sector analysis methodology

Within MSCI GICS (Level 1) sectors, we divided companies into quintiles according to their ESG scores. We then measured subsequent performance, volatility, fundamental metrics etc. The Telecommunication Services sector was omitted from the analysis due to too small a number of companies to analyze

### Metric definitions

**Price volatility** is calculated as standard deviation of 252 days returns, annualized.

**Peak to trough price decline:** Measures the maximum loss from the peak to the trough of the stock's return stream before a new peak is attained, based on 60-month trailing returns.

**EPS volatility** is calculated as standard deviation of y/y changes in the last 12-mth EPS in the last 12 quarters – thus it assesses the earnings volatility of a company over the prior three years.

**EBITDA/EV:** Earnings before Interest Taxes Depreciation and Amortization (EBITDA) is calculated as [Operating Income plus depreciation & amortization expense minus most recently reported earnings]. Enterprise Value is calculated as [Equity Market Capitalization plus Long Term Debt plus Short Term Debt plus Preferred Stock plus Minority Interest minus Cash & Cash Equivalents].

### Bankruptcy analysis

For the companies in our universe which filed for bankruptcy over the time period of the analysis, we tracked the ESG scores as of one year prior and five-years prior to the bankruptcy filing event.

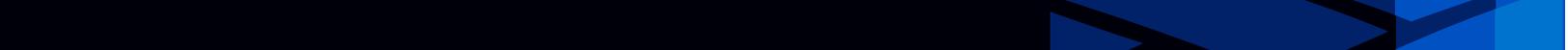
### S&P common stock ratings

The Standard & Poor's Common Stock Ranks attempt to capture the growth and stability of earnings and dividends with a single rank from A+ to C or D using a 10-year look-back period. Quality rankings are based on the following scale (companies without a 10-year earnings history are not ranked):

**Table 8: S&P common stock ratings**

Quality Rank	Description
A+	Highest
A	High
A-	Above Average
B+	Average
B	Below Average
B-	Lower
C	Lowest
D	In Reorganization
LIQ	Liquidation

Source: S&P Dow Jones indices



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