

Corporate Sustainability Metrics: What Investors Need and Don't Get

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Abstract: Corporate sustainability reporting has begun to attract mainstream investor attention. While traditional socially responsible investors use Environment, Social, and Governance (ESG) performance metrics to exclude “bad actor” companies from their portfolios, the new interest comes from those who hope to match or beat market performance benchmarks. The prevailing wisdom suggests, however, that corporate sustainability leadership only rarely translates into marketplace success and recent studies to disprove this wisdom have not yet resulted in a compelling case. This article assesses the factors that underlie the evidence and challenges the conclusion that sustainability and market success are not linked. It explains that a clearer conceptual “sustainability” framework and an improved ESG metrics methodology would position mainstream investors to connect ESG scores to financial performance – sharpening the business world’s focus on sustainability.

Keywords: Sustainability Performance Measurement, ESG Metrics, SRI Investing, Sustainable Investing, Materiality

Introduction

Student activists across the nation have begun to put pressure on university endowment managers with their call for divestment of holdings in enterprises with large “carbon footprints.” With this effort to shine a spotlight on companies deemed to be the primary culprits in the battle to prevent climate change, the “fossil free” movement adds a new flank to the world of socially responsible investors (SRI) who want their portfolios to align with their *values* – and thus seek to steer clear of owning shares of corporate bad actors including big polluters. Beyond the SRI world, a growing number of mainstream investors have begun to show interest in the sustainability of the companies in their portfolios with a particular focus on how climate change might affect their returns. These *value* investors want, in some cases, to put their money into sustainability leaders with an expectation that these companies will outperform the market over time. Other investors simply want to mitigate risk by avoiding holding shares of companies that may underperform in the years ahead as climate change and other sustainability concerns become more salient. And yet others would like to put their money to work in support of a sustainable future so long as this tilt in their portfolio does not produce significant “tracking error” compared with benchmark investment vehicles.¹

Evidence of the move of sustainability from the margins to mainstream investors can also be seen in the emergence of the United Nations Principles for Responsible Investment (UNPRI), an initiative to integrate sustainable practices, including environmental responsibility, into the financial arena by requiring investors to adopt 6 guiding principles.² In 2015, the UNPRI reported over 1300 signatories including 1200 investment managers and asset owners representing over \$59 trillion in assets under management (up from \$4 trillion in 2006).³ In another gauge of this trend, the Global Sustainable Investment Alliance reported last year that

\$6.57 trillion of U.S. assets under management are invested in *sustainable, responsible, or impact* investment strategies. This total represents an increase of 76% since 2012.

A range of thought leaders are adding momentum to mainstream investor interest in sustainability. Michael Bloomberg, for example, recently called on companies to report more fully on their climate change impacts.⁴ Likewise, Larry Fink, the CEO of BlackRock, the world's largest asset manager, authored a widely disseminated letter to corporate leaders arguing for more attention to environmental and social elements of corporate performance.⁵

This sustainability trend brings us to a puzzle that is the central focus of this article: Why does there remain deep skepticism among investors, market analysts, and academics about whether corporate “sustainability” pays off in the marketplace? Or to put the point more precisely: Why is there persistent doubt about whether the available ESG metrics track corporate performance elements that are *material* to stock market success?

This article uses information gleaned from an extensive set of interviews with investors, market analysts, and data providers in the field of sustainability finance to assess these challenges. We begin by digging in to the question of whether corporate sustainability leadership translates into marketplace success and challenging the prevailing wisdom that it will almost never do so. We identify both conceptual and practical problems with the existing framework of ESG data and the ways the available metrics are being deployed by investment managers and academic analyses. In doing so, we offer several explanations for why the studies on the relationship between sustainability and market performance come to such divergent conclusions.

We then advance a proposal to reconfigure what ESG metrics are reported – and how the numbers are collected, structured, normalized, validated, updated, and used. Our intent, through a careful survey of the sustainability metrics landscape, is to better understand the limitations of

today's ESG metrics and to put forward an alternative framework that would meet the wide-ranging needs of mainstream investors. By reconceptualizing the dialogue over ESG metrics and marketplace success, we hope to clarify the path forward for mainstream investors who wish to bring sustainability factors into their portfolio analysis. From a societal perspective, if interest in sustainability as a factor in investment decisions were to become broad-based, a powerful incentive would be created to encourage companies to focus more assiduously on their sustainability challenges – and those of the planet -- and to report on these efforts more fully.

We have structured this article in four parts. In Part I, we explore the prevailing wisdom that sustainability leadership will only rarely materially affect a company's market value. We survey a wide range of studies and analyses, and find the data and conclusions about the sustainability-marketplace success correlation to be divergent. Taken as a whole these equivocal results may help to explain the significant skepticism about the probability of a stock market payback to sustainability leadership found in the academic literature and reiterated in our interviews with market participants. But we believe the conclusion that has been drawn by many: that sustainability should not be seen as a *material* factor in determining financial performance -- is wrong or, at least, over-stated.

Indeed, as we argue in Part II, contrary to those who conclude that the underlying relationship is not significant, we think the lack of a robust relationship stems from three other issues that have not been highlighted in most sustainable investment discussions:

- Confusion about what sustainability means;
- Lack of clarity about the goals of sustainability-oriented investors: and
- Methodological weakness of many ESG metrics used to gauge sustainability.

In Part III, we offer a way forward that addresses each of these issues with particular emphasis on (a) the need for greater conceptual clarity in any discussion that purports to address

sustainability in the investor context (b) a recognition that different investors will want different types of ESG information, and (c) a taxonomy of methodological reforms and “best practices” that we believe need to be adopted to make corporate sustainability data and reporting more rigorous and useful.

We offer a series of conclusions in Part IV including an agenda for further research and action that would enable mainstream investors seeking to bring a sustainability lens to their investment analyses -- on whatever terms they wish – to be able to do so. Specifically, we suggest that the key to bringing clarity to the corporate sustainability puzzle laid out above is a sharper focus on what constitutes the right ESG framework (and thus the relevant sustainability metrics) for investor-specific “use cases.” Simply put, we argue that context matters, and sweeping conclusions are almost certain to be wrong. With greater conceptual clarity and more rigorously structured metrics, we believe the elements of sustainability that matter in various contexts can be brought into sharper relief. As carefully specified relationships between *some* ESG performance indicators and marketplace success are demonstrated, we expect to see a shift in investment capital toward enterprises that lead on these elements which, in turn, will create incentives for greater sustainability focus in the business world.

Methodology

Our project offers both a reconceptualization of *sustainability* in the investor context and a survey of ESG data methodologies and use based on a combination of practitioner interviews, academic literature review, media reporting, and analysis of professional standards and practice. The core conceptual claims and ESG data critiques came out of a roundtable discussion convened by the authors in New Haven, CT in April 2015 with 40 investment advisors,

endowment managers, and other practitioners at the interface of finance, sustainability, and equity investing. This dialogue provided the insight that the term sustainability was being used in very diverse ways by different marketplace participants and that investors have widely varying degrees of willingness to sustain subpar returns and thus highly divergent sustainable investing interests and ESG data needs. The roundtable also helped to flesh out the spectrum of shortcomings that plague the existing frameworks of sustainability metrics. We further developed the survey with follow-up interviews with many of the roundtable participants – and dozens of additional participants in the world of sustainable investing.

Table 1: Key Terms and Definitions

Term	Definition
ESG	‘Environmental, Social and Corporate Governance’ – representing the core sub-categories of sustainability that investors have tracked and which might affect an investment’s financial performance.
Material	Defined by the US Supreme Court as information that presents “a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of information made available.” TSC Industries, Inc. v. Northway, Inc., 426 U.S. 438 (1976). ⁶
Metric	Metric is used to refer to a gauge or measurement that tracks company-scale performance of an issue or indicator of interest.
Proxy Metric	In many cases a direct measure of performance for a given indicator is not possible or feasible. In such cases, companies or analysts will use proxy metrics that <i>indirectly</i> measure performance.

Use Case	As used in this paper, “use case” refers to the purposes to which sustainability metrics are being put – recognizing that investors, market analysts, and academics may use the same ESG datasets to assess very different dimensions of sustainability.
Socially Responsible Investors (SRI) or “Values” Investors	Investors who use ESG metrics to screen out (“negatively screen”) companies from their holdings that they believe violate some core value or principle of the investor.
Value Investors	Investors focused on identifying companies with recognized stock market <i>value</i> that will deliver strong financial returns on their equity holdings – to be contrasted with “values” investors whose primary focus is on eliminating “bad actor” companies from their portfolios without particular regard to the impact on their returns.

I. Sustainability and Market Value

The parallel facts of growing demand for corporate sustainability information among mainstream investors and persistent skepticism that sustainability leadership translates broadly into stock market success raise two important questions. First, does sustainability leadership *systematically* lead to improved business results and thus stock market outperformance? Second, are the available ESG metrics adequate to separate *real* leadership – that translates into material financial rewards in the marketplace – from more superficial and financially immaterial sustainability claims?

Empirical studies of the relationship between corporate sustainability (as measured by various *social* and/or *environmental* metrics) and financial performance diverge widely in their

results. Some scholars have reported finding statistically significant relationships between corporate sustainability (or social responsibility) and financial performance. Orlitzky et al. conducted a meta-analysis of 52 studies on the topic (up to the year 2003) and concluded “corporate virtue in the form of social responsibility and, to a lesser extent, environmental responsibility is likely to pay off.”⁷ Other academic studies have reached similar conclusions. Eccles, Ioannou, and Serafeim, for example, observe that “High Sustainability” companies (those that adopted sustainability policies by 1993) significantly outperform other companies in both stock market performance and accounting results.⁸ A team of Oxford University researchers, in conjunction with an investor group, Arabesque Partners, recently reviewed 190 academic studies of the business case for corporate sustainability -- and found significant quantitative evidence that strong standards and top-tier ESG performance result in better operational results, lower costs of capital, and improved stock price performance.⁹

But other empirical studies have concluded that the correlation between financial performance and sustainability is mixed or absent. Vogel has raised doubts about the payoff from corporate environmentalism for years, arguing that the opportunities for environmental initiatives to make a material difference to a company’s profitability will be few and far between.¹⁰ Marcus offers recent reinforcement for this view. His book, *Innovations in Sustainability*, explores 20 corporate case studies of sustainability-driven innovation and finds that making such efforts pay off is a “formidable task.”¹¹ He notes, for example, that the much-vaunted investments of Intel Capital and Google Ventures in cutting-edge clean tech projects do not seem to have translated into successful financial returns for the parent companies.¹² Flammer, using “close-call sustainability” shareholder resolutions, found that labor productivity and sales increased following the adoption of these resolutions, but the correlation broke down when looking beyond

these close-call examples.¹³ Barnett looked specifically at stakeholder reactions to corporate misconduct and found that response to be inconsistent.¹⁴ Kitzmuller and Shimshack looked across the extant literature of empirical studies and found a mixture of results from “consistent empirical evidence” of the effect of corporate social responsibility (CSR) initiatives on consumer markets to “limited systematic empirical evidence” between CSR and innovation or shareholder preference.¹⁵

However, these empirical studies all suffer from a lack of controls that would allow identification of the causal factors underlying the correlation. Three recent statistical correlation studies of sustainability and self-reported or market valuations did not attempt to test potentially confounding factors that might be driving the observed correlations.¹⁶ These methodological shortcomings make it hard to draw useful conclusions from these studies. Fundamentally, it remains unclear whether the correlations are driven by sustainability factors -- or by related corporate practices such as better governance structures, greater stakeholder engagement, increased transparency, or simply superior management. Endrikat found, for example, correlations between negative and positive environmental “events” and financial valuations.¹⁷ Klassen and McLaughlin similarly identified correlations with environmental awards.¹⁸ But neither study controlled for other dependent variables such as corporate governance, environmental performance, or management strength. Meanwhile, Ueng found a strong correlation between financial performance and corporate governance structures such as board rating, board compensation policies, accounting practices, and formal governance policies – all of which are indirectly related to aspects of sustainability.¹⁹ In the presence of dependent variables such as governance structures, it has been very difficult for empirical studies to tease out causal factors.

The second impact of the lack of controls and clarity over causal connections is that the existing studies leave doubt as to whether more sustainable companies create financial value -- or whether more financially valuable companies invest more in sustainability. Two studies from the 1990's looking at the effect of corporate environmental responsibility both expressed uncertainty as to which direction the causality might run.²⁰ More recently, Clarkson et al. tested the time dependence between reduction in polluting emissions and financial performance (cash flow, leverage and growth) and found that those firms that reduced environmental pollution performed better financially before and after the pollution reduction efforts.²¹ They conclude that environmental responsibility is good for business, but businesses cannot take advantage of this benefit because of constrained resources. The corollary conclusion could be that more financially solid companies have the resources to be more environmentally responsible.

How does one explain the difficulty in demonstrating a meaningful relationship between sustainability performance and stock market results? Perhaps the scope of "green to gold" opportunities that Esty and others have identified²² are much narrower than has been posited. Many academic studies and investment experts attempting to rationalize this lack of consistent empirical data have concluded that corporate responsibility or "sustainability" leadership rarely translates into superior financial return. Vogel makes this argument when he notes that CSR and sustainability efforts may only make strategic sense "if virtue pays off," the circumstances for which he finds rather limited.²³ Kotchen and Moon note a correlation between CSR activities and corporate irresponsibility -- specifically that companies that have committed some act of irresponsibility (for example, failures of governance) may initiate CSR efforts as a counterbalance to their perceived problems, although not necessarily in the same space (i.e., not resolving the underlying governance issue).²⁴ Orlitzky suggests that the disconnect may arise

because CSR is not related to financial value, but rather it creates “noise” in the marketplace leading to volatility. Under conditions of volatility, investors more frequently fall back on common perceptions in assessing corporate value (e.g., giving higher valuations to consensus sustainability leaders) even though these factors, including CSR leadership, may not systematically result in improved financial performance.²⁵

Even those who think that sustainability outperformance may translate into sales success or other business gains acknowledge that this relationship does not seem to be consistently recognized in stock market valuations. Eccles and Serafeim, in particular, concede that, in many cases, capital markets do not reward firms for their ESG efforts.²⁶

In trying to make sense of these divergent results, we note that those who find a statistically significant relationship between sustainability and business performance and those that do not are looking at different elements of sustainability – and therefore really not talking about the same thing. For example, the studies mentioned above have investigated different causal factors (environmental awards (Klassen and Mclaughlin), governance structures (Uegi), shareholder resolutions (Flammer), accountability structures (Eccles et al.), stakeholder reactions (Barnett) making comparison difficult. The studies are also using different criteria to determine “responsible companies,” such as the presence of policy (Eccles et al.) or inclusion in rankings (Laurenco et al., Kurapatsjke, Ameer). What these studies *actually* seem to say is that some aspects of ESG performance correlate with financial results – and others do not. Indeed, several authors point to this variance and state that the data does not allow testing of specific causal factors.²⁷

II. Sustainability in the Investment Arena: Conceptual and Methodological Weaknesses

In this Part, we tackle the puzzle laid out above – offering 3 explanations for the divergent empirical findings regarding the relationship between sustainability metrics and stock market success. We posit that the confusion and uncertainty with regard to the correlation between sustainability leadership and marketplace valuation relates more to conceptual confusion and data flaws than to fundamental shortcomings of corporate sustainability theory.

A. Definitional Confusion

Much of the debate over the link between sustainability and business success might be a function of loose use of the term *sustainability*, which covers many issues across the broad categories of Environment, Social, and Governance performance. Indeed, many of the ESG data providers offer hundreds of separate “scores” or metrics in their corporate ESG databases.

Table 2: Sample of ESG and Sustainability Metrics Offered by Major Data Providers

Provider	Product	Metrics
MSCI	Sustainable Impact Metrics ²⁸	Six Social Themes (Nutrition, Disease Treatment, Sanitation, Affordable Real Estate, SME Finance, Education) and five environmental themes (Alternate Energy, Energy Efficiency, Green Building, Sustainable Water, Pollution Prevention)
MSCI	ESG Fund ²⁹	Includes metrics “across three dimensions: Sustainable Impact (to measure fund exposure to companies that address core environmental & social challenges); Values Alignment (to screen funds for investments that align with ethical, religious or political values); and Risk (to understand fund exposure to ESG-related risks)”
MSCI	ESG Rating ³⁰	Includes “80 Exposure Metrics (business segment and geographic risk exposure” and “129 Management Metrics (based on policies, programs, & performance data).”
MSCI	Carbon Solutions ³¹	Includes “a comprehensive range of data on fossil fuel reserves, carbon emissions and sector application”
Bloomberg	ESG Disclosure Scores ³²	Over 120 Environmental, social and governance indicators keyed to the Global Reporting Initiative list of performance indicators
Thomson Reuters	ESG Data ³³	Includes “over 70 Key Performance Indicators” in three categories: Environmental (Resource Use, Emissions, Innovation); Social (Community, Workforce, Human Rights, Product Responsibility); and Governance (Management, Shareholders, CSR Strategy)

Note: Not exhaustive

Not all of these metrics have clear theoretical ties to business results or stock performance. Some of the issues are tracked because a recognized subset of SRI investors wants to screen out companies operating in certain industries such as alcohol, gaming, gun-making or other categories that generate opprobrium. Thus, mainstream investors – i.e., those who prioritize having their investments generate strong returns -- need clarity on what *sustainability* means in a particular investment context and an empirically derived sustainability framework that highlights the subset of ESG issues that have a demonstrated “material” impact on marketplace outcomes.

The complexity of sustainability as a organizing concept and the implications of divergent views about how broad the scope should be inevitably leads to analytic confusion as people hear different things when the word “sustainability” is used. But the conceptual challenge is even more profound. Indeed, even where two investors agree on a topic’s salience, they may differ on what constitutes the “sustainable” position. For example, some environmental advocates view nuclear power as critical to a low-carbon future and would put utilities with nuclear plants in their generation portfolios on the positive side of the ledger. Other environmentalists see nuclear power as dangerous and thus would want to put nuclear companies in a negative category. Likewise, some investors see stem cell research as a critical technology for the future while others would put companies involved in this line of research on their blacklist.

The diversity of indicators considered by different organizations to be within the bounds of sustainability has been documented in corporate sustainability reports. Tonello examined 94 the corporate sustainability reports of 94 Canadian companies and identified 585 different indicators of sustainability performance.³⁴ Comparisons of the reports showed little in the way of issue overlap meaning that the companies had very divergent views as to what indicators

constituted the core measures of sustainability. Tonello found that only twenty-two percent of indicators were used by more than three corporations and fifty-five percent of the indicators were used only once. Without agreement on what constitutes “sustainability” and with so many issues and divergent values in play, it cannot be a surprise that the correlations between *sustainability* performance and stock market results do not seem meaningful. Simply put, the studies look at entirely different things – and have not been clear on the definition of sustainability that underlies the analyses put forward.

B. Divergent Investor Sustainability Interests and Expectations

Investors also bring very divergent interests and values to their focus on sustainability. As noted above, the range of issues that fall under the sustainability rubric can be very broad meaning no two investors would highlight the exact same list of ESG metrics. Investors also range widely in how much they prioritize optimizing their returns versus having their portfolios aligned with their values concerning the environment, social justice, and other issues. We see at least five distinct classes of sustainability-minded investors:

1. SRI or *values* investors
2. Green Alpha investors (who believe sustainability leaders will out-perform the market)
3. Mainstream or *value* investors who perceive sustainability issues becoming more salient and want to mitigate the risk of being invested in *unsustainable* companies
4. Mainstream investors who want not only to *divest* from unsustainable companies but also to *invest* in sustainability leaders
5. Impact investors who want to see a *sustainability* return on their capital and are thus looking for *social* or *environmental* results as well as financial returns

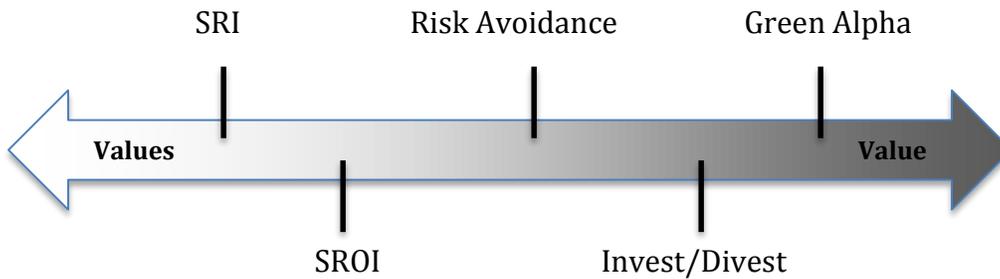
Table 3: Summary of investor types interested in sustainability metrics

Investor Type	Description	Metrics Needs
SRI or Values Investors	<p>These investors --- including religious organizations, environmental groups, labor unions, and some politically minded individual investors -- seek to steer clear of companies that sell alcohol, tobacco, gambling services, or guns – or those that have bad environmental performance or labor rights records. In many cases, they are willing to forgo top-tier investment returns to promote their values.</p>	<p>To meet their needs, fund managers have set up “negatively screened” investment vehicles that allow these investors to exclude from their portfolios stocks that raise whatever concerns a particular group or individual wants to highlight. The data behind these screens therefore focus largely on industry categories. Renneboog et al. identified 21 different ESG screens actively employed by values investors grouped into four categories: sin screens (tobacco, alcohol, gambling, weapons, pornography), ethical screens (animal testing, abortion, genetic engineering, Islamic, healthcare), corporate governance and social screens (related to corporate governance, business practice, community, labor diversity, labor relations, human rights, foreign operations) and environmental screens (nuclear, environment, renewable energy).³⁵</p>
Green Alpha Investors	<p>Investors that wish to use environmental data to identify companies with superior environmental performance, which they hope will translate into economic outperformance in the marketplace.</p>	<p>Ideally, these investors seek performance metrics that document a causal link between sustainability and financial performance. These investors undertake careful company-by-company sustainability research.³⁶ In the absence of causality, these investors rely on correlated data sets or intuitive assessments of sustainability risks and opportunities presented by a company’s operations, geography, value chain, etc.</p>
Risk Avoidance	<p>Similar to values investors, this group seeks to remove perceived ‘bad’ companies and</p>	<p>Slightly more specific than negative screening data, the investor interested in avoiding ESG</p>

	sectors from their portfolio based on long-term risks.	risk seeks data on sector, primary operations and performance of specific environmental performance such as gross carbon emissions or carbon emissions intensity.
ESG Investment and Divestment	Investors that would like to factor carbon exposure or other environmental issues into their investment decisions but in strategic ways. These investors generally do not want to sacrifice returns. In investment terms, they want to minimize the “tracking error” with comparable non-sustainability screened portfolios. As opposed to green alpha investors, the mainstream investor is not seeking to outperform the market using sustainability data, but rather to ensure sustainable returns by strategically assessing a given company’s performance against long-term trends in sustainability.	The ESG investment/divestment investor seeks data that measures a company’s performance against trends in sustainability. For example, the ability of a company to respond to constrained resources (including carbon), consumer demands for green products, distributed commerce (energy, mobility), etc.
Social Return on Investment (SROI) or Impact Investors	A small set of investors seeks to measure return on investment more broadly than financial return. Social Return on Investment (SROI) refers to the measurement of social (or environmental) benefits accrued by a wide range of stakeholders from a given investment. Importantly, these benefits do not have to be accrued (or internalized) by the investment vehicle and therefore do not have result in monetized benefits to the investor. This means that the SROI investment strategy is a principles-based strategy similar to the Values Investor, and that the metrics important to the SROI investor are based on perception of value from stakeholders as opposed to a requirement for measure of performance. ³⁷	SROI seeks to place a value on social and environmental benefits as measured by broad stakeholders (e.g. communities). Therefore, the SROI investor seeks metrics that measure perception of stakeholders regarding the value of social or environmental benefit.

This spectrum of investors generates highly divergent views as to what the appropriate list of sustainability issues would be – and thus what ESG metrics are relevant. Moreover, the existing ESG data sets meet the needs of these investors with varying degrees of success. As the longest standing category is SRI investors, most of the data providers now offer quite carefully constructed negative screens that provide a basis for excluding companies that make guns, sell alcohol, or promote gambling. But the available ESG data are insufficiently refined to address some emerging concerns of values investors, notably those wanting to promote decarbonization (as we discuss in Part IIC below). Those who want to invest in companies that are offering their customers sustainability solutions have even fewer metrics to deploy with any degree of comprehensive coverage. And those interested in the “social return” of companies have virtually nothing in the way of metrics upon which to rely.

Investors also diverge in how much they are willing to allow their values preferences to affect their portfolios’ volatility and thus anticipated returns. Investors can be arrayed on a spectrum from those driven fundamentally by their values (and willing to sacrifice returns) to those who focus entirely on maximizing returns.

Figure 1: Spectrum of Sustainability Investor Types

This divergence in underlying attitudes means that one whole class of investors simply wants to exclude companies on their core concern list from their portfolios. These “values” or “negative screen” investors care very little about the relationship between ESG scores and market results. Among the remaining investors, some (such as Generation Investment Management, Green Alpha Advisors and Impax Asset Management) are interested in what might be called “green alpha,” which is to say they seek to outperform the market by holding an actively managed portfolio of sustainability leaders – believing that this leadership will translate into systematic market outperformance. Others want to lean in the direction of a sustainable future by tilting their holdings toward more sustainable companies so long as the resulting tilt does not produce significant underperformance of the portfolio. How much underperformance is “significant” and therefore unacceptable will vary across individuals.

Mainstream investors see “sustainability” differently from traditional SRI investors, who simply wanted to screen out certain companies from their portfolios. Today’s sustainability-minded *value* investor cares whether ESG metrics translate into material financial returns in a way that SRI investors do not. But most of the ESG data frameworks available to investors

today track *reputational* issues not *operational* factors that might deliver lower costs, reduced risks, faster growth, improved productivity, or enhanced innovation capacity. Thus, the picture of sustainability that is available to investors provides little foundation for identifying the companies whose sustainability strategies are delivering marketplace value.

Because the data does not currently allow forward projections of value, investors tend to *react* to sustainability headlines such as the recent revelations of emissions tampering from Volkswagen or the media flurry around Tesla's new battery systems. But if market analysts had access to a framework of ESG metrics that offered a forward-looking gauge of sustainability elements related to growth and productivity as well as risk (rather than a backward-looking picture of past corporate performance), these indicators might help investors spot sustainability *leaders* whose returns will outperform the market as a whole. More to the point, methodologically rigorous corporate ESG metrics that had demonstrated materiality with regard to financial returns would almost certainly be taken up by more mainstream investors, which would expand the role that sustainability plays in their asset allocation decisions. Expanded interest in sustainable investing would, in turn, sharpen the focus of CEOs and other corporate leaders on their climate change exposure in particular and sustainability more generally.

To the extent that the rising interest in sustainability is simply a new sub-class of values investors – those who want, for instance, to take carbon-intensive companies out of their portfolios and are not concerned about sacrificing some measure of returns – then the current ESG data may seem to be adequate. But we argue that better data would permit more nuanced divestment strategies on challenging issues such as climate change. With limited information, investors have limited choices. For example, when Stanford University responded to divestment pressures in 2014 it might have wanted to rigorously put its investment muscle behind a climate-

safe future, but given limited data, it chose instead to promise to sell off the coal assets in its endowment.³⁸ The University of California pension and endowment also moved to sell off \$200 million worth of coal and oil sands holdings. According to UC Chief Investment Officer Jagdeep Bachner, this decision was not based on ethical concerns but rather undertaken to address “slowing global demand, an increasingly unfavorable regulatory environment, and a high threat of substitution [which] pose insurmountable challenges to coal mining companies.”³⁹ The Norwegian Sovereign Wealth Fund launched a similar strategic move out of coal in 2015.⁴⁰

However, some investment managers believe that such blunt approaches to sustainability screening are not meaningful -- and may even be counterproductive. Are diversified companies with *any* fossil-fuel-burning assets to be excluded? Should, for example, Berkshire Hathaway, with its energy subsidiary, go on the blacklist? Should that exclusion extend to consumer products that burn fossil fuels such as car manufacturers? Should companies with nuclear power plants be in or out of the portfolio? Might it be misguided to divest from an oil and gas company that is one of the largest investors in alternative energy technologies? Should, for instance, a sustainability-minded investor exclude from her portfolio NRG, one of the nation’s most fossil-fuel-intensive utilities -- but (up until recently) led by a visionary CEO, David Crane, who dramatically ramped-up NRG’s commitment to rooftop solar power, energy efficiency, and distributed generation?⁴¹

For values investors, the existing ESG data may be so weak that they do not allow those who would like to invest in *sustainability* leaders or to underweight or exclude *sustainability* laggards – however defined -- to differentiate sufficiently among companies. We explain below why the presently available metrics are so deficient – and develop a taxonomy of methodological

refinements that must be addressed to make sustainability metrics useful to value-seeking investors.

C. Sustainability Data Shortcomings

The existing ESG metrics build on data sets constructed to meet the categorical exclusions that traditional values investors wanted to address. But for investors with broader sustainability interests, the existing ESG data are often inadequate. The available metrics are too narrowly focused, methodologically flawed, or misaligned with the sustainability elements that might drive value in the marketplace. Thus, some of the disconnect between investor expectations and the empirical results of sustainable investment strategies flows from reliance on data that are conceptually misguided or inappropriately constructed. The data providers are, of course, trying to meet the growing interest in sustainability performance, but the metrics they are offering to the sustainable investment community have not kept up with the expanding “use cases” to which their data are being put.

CDP, for example, gathers information on greenhouse gas releases. GRI provides a framework for corporate sustainability reports. These metrics are then aggregated and analyzed by ESG analytic firms such as MSCI or Thompson Reuter or folded into sustainability ratings put out by agencies such as Robeco/SAM and *Bloomberg*. But the metrics available are perceived by many users to be deficient in a number of respects – as our interviews with practitioners made clear.

Table 4: Summary of current ESG data shortcomings

Type	Gap	Summary
Application	Operational vs Reputational Metrics	In the absence of quantifiable performance metrics, much of the current data focuses on stakeholder perceptions of companies drawn from media reports on controversies and reputation rather than operational performance.
	Footprints vs Handprints	While a company's own environmental impacts (footprint) is useful, it is incomplete. To assess a company's contribution to a sustainable world, investors also need to be able to track the impact of the company's products and services.
	Upside Opportunities vs Downside Exposure	Much of the current data looks backwards to measure impact, while much of the potential value of sustainability to financial performance lies in the ability of the company to recognize and take advantage of opportunities to become more sustainable.
	Materiality	To make corporate sustainability metrics more meaningful, much more focus needs to be given to what really matters in terms of environmental impacts – and the structure of metrics needs to re-gear to reflect this <i>materiality</i> analysis.
	Broad Frameworks vs Narrow Focus	Most guidelines for data disclosure are broad to be inclusive of many sectors and many issue areas. What is needed is a mix of core issues broadly applicable combined with additional industry-specific metrics.
Methodological	Measurement	Even critical ESG categories are not tracked using consistent guidance on data collection resulting in large inconsistencies in measurement.
	Required vs Self-Reported	While mandatory metrics of performance in sustainability continue to grow, the majority of material issues remain voluntary resulting in gaps and inconsistencies.
	Conflicts of Interest	Some data providers not only aggregate ESG information

		but also provide consulting services that guide companies on how to improve their sustainability scores.
	Monitored vs Estimated	Very little sustainability data comes from actual measurements. The majority of ESG metrics are modeled or estimated using assumptions of varying validity.
	Verification	Although a growing number of companies now provide third-party validation of their sustainability reports, many do not, meaning their data is simply self-reported.
	Coverage	Significant gaps in disclosure remain despite the growth in corporate sustainability reports over the years.
	Gap-filling	Where critical data are not disclosed, the companies selling data streams will often attempt to fill the data gap using proxy metrics, imputed results, or non-transparent extrapolations.
	Normalization	Many data sets require normalization to a common benchmark to allow for meaningful (“apples to apples” comparison – but a surprising number are not normalized.
	Timeframes and Updating	The collection of data and the updating of data in analyst databases is inconsistent and generally infrequent compared to the expectations of mainstream investors.

Operational versus Reputational Metrics

Is Dow Chemical a sustainable company? From a values investor point of view, Dow has a long legacy of pollution, notably dioxin contamination in the United States Midwest in the mid-20th century, the company’s purchase of the infamous Union Carbide, and its role as a major manufacturer of Agent Orange during the Vietnam War. It might well be excluded therefore from some *sustainability*-screened portfolio. But in recent years, Dow has become a recognized leader in sustainability. The company has a globally recognized safety program and under CEO Andrew Liveris, Dow has issued multiple sets of specific, quantifiable sustainability targets spanning from operational efficiency to innovation and supporting the global circular economy.

The company reports that 10% of sales (\$5.8 billion) now come from products that “are highly advantaged by sustainable chemistry” including auto body adhesives that improve safety while reducing vehicle weight and soap that lasts longer and works more effectively.⁴²

So if one looks at Dow from an operational perspective rather than a reputational one, the company emerges as a sustainability leader. Recognition for Dow’s sustainability efforts is coming from all angles including top 10 Greenest companies in the 2015 Newsweek rankings, the “Heroes of Chemistry” Award, and one of the top 10 “Impact Companies to work for” named by Net Impact. Yet little of the available ESG data with its backward-looking focus captures these recent accomplishments or Dow’s forward-looking potential to benefit from delivering sustainability solutions for its customers.

Forward-Looking versus Backwards-Looking

Much of the existing ESG data framework looks backwards rather than forward. Measurements of past results are much easier to get ahold of than projections about a company’s future performance. But backwards-looking metrics (especially ones that go back decades) may not be very relevant as investors seek to understand which elements of sustainability track stock market success.

GE, for example, gets black marks on its sustainability scorecard for dumping PCBs in the Hudson and Housatonic Rivers in the middle of the last century. But is this a fair gauge of its current or future sustainability? Isn’t it more useful to investors to know where the company is going with its efforts to make jet engines more fuel efficient or expand wind power? Getting a clear fix on a company’s future trajectory can be difficult, but some measure of the management team’s attitude toward and planning for sustainability as an element of strategy would be very useful to mainstream investors.

Footprints versus Handprints

To the extent that the current ESG framework offers metrics on current performance, almost all of the data centers on the environmental impacts -- or “footprint” -- of the companies being scored including energy and water use, waste generation and carbon emissions. While all of these elements are useful to know, they paint an incomplete picture of the sustainability of a company. As in the case of Dow discussed above, it is often equally important to know how a company affects the sustainability of its customers. Does the company bring a design for the environment emphasis to its products? Does it seek to solve the energy or environmental challenges of its customers? In short, a company’s sustainability “handprint” (sometimes referred to as “product responsibility” or “product impact”) can be orders of magnitude more significant than its sustainability footprint.

To be more specific, an investor who is trying to understand how Dow will fare in the face of the emerging sustainability challenges and opportunities⁴³ needs data on the market transformation that Dow is delivering in energy efficiency, safety, waste reduction, and other product categories. As a longstanding industrial company, Dow’s legacy of pollution is real but much less relevant to its prospects in the marketplace than its current sustainability leadership, especially its focus on meeting customer needs for energy and environmental breakthroughs.

In some industry categories, moreover, the footprint is so light and the handprint so heavy, that a traditional ESG analysis focused on direct company impacts will severely warp any sustainability comparison. In financial services, for instance, a bank’s sustainability profiles should not turn on the energy use or paper recycling in its branches but rather on the carbon footprint of the projects in its loan portfolio, or the carbon benefits accrued by these assets. Similarly, software companies might well be better judged by the sustainability gains made

possible by the apps they develop rather than just the level of electricity consumed by the computers they run. Salesforce.com, for example, makes the case that network IT solutions have reduced the carbon emissions of its customers by 95% compared to on-premises applications.⁴⁴

Upside Opportunities versus Downside Exposure

To the limited extent that ESG providers offer data that might allow investors to bring a forward-looking sustainability perspective to bear, most metrics are *risk* focused. Data sets that provide a gauge of companies' carbon footprint are now available. These greenhouse gas emissions scorecards allow an investor to identify which corporations or sectors might be exposed if CO₂ emissions were priced or faced more severe regulation. But there is little information available on "upside" climate change exposure that might allow an investor to go long on companies or sectors that will thrive as carbon pricing becomes more widespread. So an investor can get visibility on the risk in ExxonMobil but not the opportunity in Honeywell.

At least some sustainability-minded investors thus need data that paints a broader picture of corporate energy and environmental activities and strategies. While some ESG analytics firms are moving in this direction, metrics are particularly needed on sustainability-related growth including both top-line expansion of sales (from goods or services that provide sustainability solutions) and bottom-line profitability (combining both growth and improved eco-efficiency and resource productivity).

Materiality

Fundamentally, the structure of ESG reporting and data comparison needs to be recast to capture what is important or *material* to each company and its industry. Not only is data needed on *growth* and *productivity* variables and not just *risk* factors, the data needs to be tailored to industry-specific analysis of what matters with regard to an individual company's sustainability

posture.⁴⁵ The value of a material-issue focused approach was recently highlighted by Kahn et al., who analyzed firms with good performance on material sustainability issues and concluded that investments in material sustainability are shareholder-value enhancing.⁴⁶

While materiality is a well-established concept and is present in every major sustainability management system standard, disclosure guideline and risk management framework, it has yet to effectively drive strategic decision making and data disclosure on ESG issues by companies. Work is being done to bring a materiality lens to sustainability reporting. Organizations such as the Global Reporting Initiative (GRI) and AccountAbility have long recommended that companies undertaking sustainability reporting and management should reflect on those issues that are most material to the company and its stakeholders.⁴⁷ More recently, the Global Environmental Management Initiative (GEMI) released its “Quick Guide: Materiality” in an effort to give corporations a simple tool to identify and prioritize sustainability issues.⁴⁸ The Sustainable Accounting Standards Board (SASB) has linked materiality to reporting specifically through the eyes of the investor by referencing the US Supreme Court’s definition of materiality that is based on the perspective of a “reasonable investor.”⁴⁹ SASB is parlaying this materiality-centered approach into a set of industry-specific, comparable sustainability metrics that investors can more easily access and analyze.

Broad-Scale Frameworks versus Narrow-Focus

The increasing interest in materiality highlights another tradeoff in corporate sustainability data: whether the reporting framework should be extensive, covering many factors, or more targeted on a core set of metrics. Some of the most widely recognized reporting structures, notably the GRI, expanded their reporting frameworks over the past two decades to the point where companies are now being asked to assess up to 58 “General Standard

Disclosures” and 82 “Specific Standard Disclosures” as well as additional disclosures described in one of the 10 Sector Supplements.⁵⁰ Even though GRI has emphasized the need for materiality assessments to narrow this list, the practice has been largely meant to “cover as many bases as possible” to achieve stakeholder recognition and thresholds of performance defined by the GRI Guideline itself. The result has been that the guideline has frequently been counter-productive to its stated goal of *materiality*. Moreover, the sheer workload of producing a sustainability report has become an issue.⁵¹

Additional Methodological Issues

Concerns about the existing ESG data arise not simply from *what* is being collected but also from *how* the metrics are constructed. As the Big Data Revolution has swept across the world in recent years, statistical techniques have been dramatically improved and methodological rigor has improved in many contexts. But the ESG marketplace has consolidated rather than expanded – and little progress has been made on a series of basic methodological challenges in the sustainability domain.

Measurement

With no established corporate sustainability reporting structure and no government-mandated accounting rules, a series of measurement issues remain unresolved. While SASB hopes to play a role in this regard similar to the Federal Accounting Standards Board (FASB), the lack of clear and consistent guidance on what should be reported and how it should be done (with legal requirements for accuracy)⁵² means that almost all of the existing ESG data has deeply embedded credibility and legitimacy issues.

Required versus Self-Reported Data

In the United States, the EPA requires a certain degree of environmental performance reporting. These are primarily driven by regulations under the Clean Water Act and Clean Air Act, and include a wide range of industrial environmental impacts from release of toxic compounds into the air to stormwater and surface run-off into water. The Energy Information Agency (EIA) collects some additional mandatory energy data including domestic and imported fuel inputs (coal, gas, oil, nuclear, etc.) as well as energy consumption data from a wide variety of industries. To the extent that these data are publicly available, the ESG analytic companies take advantage of them. Thus, the metrics on chemical spills, discharges of toxic chemicals to air and water, while still prone to error and suffering from severe constraints on boundary which impedes comparability, are nevertheless reasonably accurate when compared to other ESG data because they are built on government mandated datasets.

But beyond these narrow categories, companies report when and how and to whom they deem it to be convenient. In addition, because much of the data in the ESG arena comes from voluntary company responses to surveys, additional inconsistencies and gaps plague the data sets.⁵³ Moreover, none of the data providers interviewed by the authors reported undertaking any systematic cross-checking or validation of the data companies report.

Conflicts of Interest

Survey data can be further distorted if those collecting the information offer consulting services to help companies “understand” how to respond to the questions being asked. Several data providers have historically had related consulting companies offer such coaching. Zurich-based Sustainable Asset Management, one of the earliest entrants into the corporate sustainability metrics world, saw its credibility suffer as a result of the perceived conflict of interest between its consulting business and its data collection efforts. Most of today’s firms

collecting, analyzing, and rating ESG data also provide paid benchmarks and consulting services around that data, making the line between “objective data collection” and “data consultation” very blurry.

Monitored versus Estimated Data

Perhaps the most fundamental issue – often hidden from those using the data – is whether ESG metrics come from measured results (e.g., actual levels of air pollution analyzed using monitoring equipment) or from estimations, which range from reasonably accurate to wild speculation depending on who is doing the estimating, what incentives for accuracy exist, and whether the tools even exist to measure errors associated with the estimations. For the sake of comparison and analysis, metrics work best when the underlying data is drawn from consistently done actual measurement, not estimations. Unfortunately, measurement-based data on critical environmental factors is surprisingly scarce.

There are a few environmental datasets that are nominally measurement-based. For instance, air emissions data from large smokestacks in the United States must follow strict measurement requirements using “in-line” monitors that record the presence of chemicals such as sulfur dioxide, nitrous oxides and volatile organic compounds. The Quality Assurance/Quality Control (QA/QC) controls are highly regulated down to acceptable error rates in the 10’s of parts per million range. These situations represent the high point for environmental data. However, even these data sets quickly run into serious methodological issues. For example, smaller stacks and combustion sources are allowed to estimate emissions based on fuel type and volume burned, or provide no data whatsoever. Even for highly regulated sources such as large smokestacks, a single company might be reporting emissions from operations in multiple

countries where the sampling protocols, error rates and boundaries of reporting vary significantly.

Accurate estimation of other sustainability data is even harder to do – and more open to data manipulation and reporting abuse. An improved corporate sustainability metrics framework thus needs to prioritize more measured data that can be collected on a methodologically consistent basis.

Verification

Another point of divergence across companies is whether they provide any verification of their self-reported sustainability data and metrics. Some corporations pay for third-party (external) entities to audit their numbers. Large enterprises like ESG/CVS, KPMG, PwC, EY, DNV GL, ERM, Deloitte and many others have made a business of such verification. Like financial auditors, their reputations depend on calling out inaccuracies to their client (the reporting company), but not necessarily to the public that is reading these reports. A little over half of the largest companies in the world that produce sustainability reports are pursuing some form of third party audit.⁵⁴ Of these audited reports, however, most verification only covers a small portion of the information in the reports.⁵⁵ When this data is collected by data analysts, it is not very transparent which metrics and which data points have been verified, if any at all.

Coverage

Currently, there are somewhere between 80,000 and 100,000 publicly listed companies in the world. As of 2015, just over 5000 corporations (predominantly public) around the world report their emissions to CDP, representing less than 5% of companies.⁵⁶ Even fewer offer metrics on other critical issues. GRI, the largest voluntary reporting guideline, provides a database listing the number of companies that have reported against each of its disclosure

recommendations (based on companies that submit their report to GRI). As of late 2015, the database included 1395 companies (less than 2% of publicly traded companies). Of these, 19% did not report water consumption, 58% did not report on water bodies impacted by the company withdrawals and 72% did not report on the impacts of water discharge.⁵⁷ This spotty coverage limits the accuracy and usefulness of the existing ESG datasets, particularly for intra-industry comparative analysis.

Gap filling

In the absence of good data on actual environmental outcomes, ESG data companies provide the “best available” data. But these attempts to get around data limitations can lead to further distortions and biases. For example, rather than providing a real gauge of a company’s environmental performance, data on the size of the company’s environmental budget or staffing sometimes gets relied upon. While in some instances such “proxy” indicators are better than nothing, data users should insist, over time, that the framework of corporate sustainability metrics evolve away from *inputs* such as money spent or projects undertaken - toward *outcomes* such as emission levels or ambient quality measures.

Moreover, how gaps get filled is frequently done with little transparency on what sort of imputation or extrapolation is being done. Some data providers report where particular numbers have come from (i.e., who has provided data), and what data is missing. Others simply fill in the blanks. ESG data companies use a variety of gap-filling strategies – and sometimes, but not always, provide a methodological appendix that details how the gaps in their data matrix were filled. Some fill gaps based on imputation from other data that is available and careful analysis of what other indicators best predict the missing data points. Many others “average around”

gaps, giving non-reporters an average score -- or sometimes the average score of similarly situated companies.

Normalization

Even if everyone were equally committed to accuracy, the lack of common reporting standards would be a problem. For instance, with regard to greenhouse gas emissions, some companies report just Scope 1 (emissions resulting from direct burning of fuels), others report Scopes 1 and 2 (adding emissions resulting from imported energy such as electricity or steam) and a small number report Scopes 1, 2, and 3 (including all other indirect emissions, other than Scope 2, that occur in the value chain of the company). The lack of consistency makes benchmarking difficult as those who report just Scope 1 may appear to be better performers than those reporting Scopes 1 and 2.

Company structure can also affect results and affect the accuracy of comparisons. For example, unless everyone in an industry reports on Scopes 1, 2, and 3 greenhouse gas emissions, a vertically integrated company will likely have much higher reported emissions than one that has been structured to focus on “downstream” (marketing) activities. Indeed, those who have hived off their “dirty” manufacturing operations may be particularly problematic. Thus, while the integrated company continues to manage the carbon footprint of its full value-chain, the company with out-sourced manufacturing may pay little attention to the impacts of its suppliers upstream. In this case, a normalized comparison would reveal the integrated company to be the better performer despite their nominally higher GHG emissions. Similarly, the company that leases assets or office spaces may have a much lower carbon footprint than the similar sized company with owned assets.

Normalization is required – and often not done – in the construction of many other datasets. For instance, MSCI, one of the most respected ESG data companies, reports on “controversies cases” as part of its Intangible Value Assessment Methodology for the companies in its data matrix.⁵⁸ Other companies such as RepRisk look exclusively at negative media mentions. But there is no indication that the count or severity of the controversies or negative media mention is normalized against company characteristics or the source of data (media, social media, regulatory response, etc.). So that Coca-Cola with global sales of \$45.91 billion with 5 controversies mentioned in the press scores worse than a \$1 billion company with 2 controversies of similar impact even though its normalized negative media score per dollar of sales is almost 20 times better.⁵⁹

Benchmarking and Comparisons

Critical to systematic sustainability analysis is the ability to make comparisons that are meaningful. It turns out that in many circumstances the most useful benchmarking is across companies in the same industry. With “peer to peer” comparisons, many of the potentially confounding factors (or what a statistician would call “missing variables”) are, in effect, controlled for. As a result, sustainability analysis on an industry-sector basis is increasingly being recognized as a best practice, particular for any degree of granular comparison. Of course, confounding factors exist even within peer comparisons. For example, is Alcoa a mining company or a consumer products company? Is Tesla a car company or a battery manufacturer? Determining the appropriate peer set is a difficult endeavor contingent on the environmental aspects in which you are most interested.

Timeframes and Updating

One of the most important questions that data providers often gloss over is the consistency of the timeframes of the data being put forward. While it may not be possible in every case for the data on each company to cover the exact same time period, this should be the goal. ESG data companies should also be more transparent about the frequency with which their data is updated. A team of graduate students at Columbia University recently published the results of a series of interviews with 10 major data analytics firms.⁶⁰ Most of the information on frequency of data updating was obtained through interview rather than public information. The reported frequency of data updating ranged from annual to “based on alerts from webcrawlers.”

III. A Path Forward for Corporate Sustainability Metrics

Developing appropriate corporate sustainability metrics, particularly ones that meet the needs of mainstream investors has a clear logic -- and yet involves layers of complexity that need to be thoughtfully addressed. Based on our research, we believe that the path forward requires: (a) greater conceptual clarity about the multiple dimensions of *sustainability* and acceptance of the diversity of investor interests and values that are in play – which means that the quest for a single, accepted ESG framework be abandoned in favor a framework or “menu” of metrics from which individual investors can choose what is relevant to them, (b) improvements – both in methodological quality and theoretical logic -- in the structure and reporting of ESG metrics so as to meet the expanded “use cases” to which investors want to put sustainability data, and (c) new empirical analysis on a granular basis of the full range of ESG metrics so as to provide clarity on which elements of sustainability show a relationship with business results and thus stock market performance.

Conceptual Clarity

The challenge of developing a sustainability metrics framework that meets investor needs is complicated by the wide range of issues that come into play. No two investors care about the exact same set of issues. In this regard, there are dozens of issues that must be tracked to meet the needs of *values* investors who want data that will allow them to negatively screen companies out of their portfolios.⁶¹ The good news is that most of these data sets exist. As we noted above there remain a series of issues around data quality that should be taken up. But the existing ESG framework works for those interested in simple categorical exclusions of certain industries and companies.

But what mainstream investors want has not yet been developed. From our research, it has become clear that what is needed is a framework of sustainability metrics that are relevant, material, accurate, and comparable – covering the full spectrum of issues about which “sustainability” investors care. More importantly, the mainstream investors – who are distinguished from traditional *values* investors by their focus on having their portfolios earn reasonable returns -- would like to know which ESG metrics correlate with financial performance and how strongly. To meet these needs, we recommend that ESG data providers (and investment advisors) sharpen their focus on the range and materiality of sustainability metrics, recognizing that what a particular investor will want to consider will vary depending on her interests, values, and priorities.

Rather than seeking to specify a precise set of sustainability metrics that will be applicable broadly, data providers should produce an ESG metrics *menu* from which investors (and their advisors) can pick items that are relevant to them. Churches may focus on concerns about armaments. Union pension funds might center their portfolio screening on fair labor

practices and wage levels. Green Alpha investors will seek ESG metrics that correlate with the marketplace success of a company and thus out-performance of its stock price.

In developing a *menu* of sustainability metrics, particular attention needs to be given to the *materiality* of ESG metrics. The US Supreme Court definition of *material*, adopted by SASB and others, centers on the information needs of investors seeking to grow the value of their investments. While ESG data providers offer hundreds of sustainability metrics, it is often unclear how material much of the information offered really is. We are not suggesting that the ESG indicators proposed by SASB, GRI, and others are not valuable. On the contrary, the ongoing work of GRI, SASB,⁶² the IIRC⁶³ and the World Federation of Stock Exchanges⁶⁴ as well as the conclusions of Kahn et al.⁶⁵ are providing valuable contributions to the ESG metrics *menu* that we suggest is needed to meet the diverse set of investor use cases.

Methodological Standards for Data Quality

Many mainstream investors do not fully trust the rigor of sustainability data. Without confidence in the numbers reported, movement of capital based on sustainability performance will continue to be slow. It is, therefore, time to move from a world of informally developed “Data Quality Principles” such as those codified by the GRI (Balance, Comparability, Accuracy, Timeliness, Clarity, Reliability)⁶⁶ to more systematic ESG “Methodological Standards.” Our research suggests such standards would need to address all of the methodological gaps summarized in Table 4 – and discussed in detail in Part II above. We believe that the time has come for standardization of ESG metrics and reporting through a framework prescribed by a governmental body (such as the Federal Accounting Standards Board) and made part of a formal annual reporting structure such as the SEC’s 10-K requirements.⁶⁷

The push for greater rigor in ESG metrics can be guided by the numerous data quality and methodological standards present in the world of finance including guidelines from FASB, the International Monetary Fund⁶⁸ and the Bank of England.⁶⁹ Indeed, these standards build off of very similar sets of data quality principles (covering: Relevance, Accuracy, Timeliness, Clarity, Comparability, and Coherence, among other things). These standards also provide procedures for statistical analysis, processes for data management, strategies for avoiding data collection problems, use of proxy metrics, data aggregation and weighting, normalization of divergent metrics, and reporting.⁷⁰

We see three main outside parties to a government-led Data Quality and Methodology Standard development initiative: (1) investors, represented through existing bodies such as SASB but also new entities that reflect the diversity of interests in ESG metrics; (2) ESG analytics firms who aggregate and disseminate the data collected; and (3) academic Institutions, which can continue to advance sustainability research including the empirical demonstration of which metrics meet materiality tests. Based on the need for comparability and transparency, it is important that the output of such an effort result in a publicly available standards that can be easily accessed by companies collecting the metrics to be reported -- and assessed by data analytics firms aggregating that data.

Further Research, Analysis, and Metrics Development

As our discussion in Part I revealed, the analytic foundations for bringing ESG metrics into mainstream investor decision making are shaky. Sweeping statements about whether sustainability leadership correlates with stock market performance are unhelpful. Given the range of elements that might be embedded in any one definition of *sustainable* or *socially*

responsible companies, it can be no surprise that empirical studies come to divergent conclusions. What is needed is more granular focus and detailed empirical analysis of specific elements of sustainability leadership that have a theoretical link to business success and therefore to stock market valuations.

We think this analytic ground has just begun to be plowed. For example, companies with concerted efforts to improve their energy efficiency should be able to reduce costs – and improve their profitability. But do such initiatives systematically translate into improved financial results? We have little evidence to answer this question. Likewise, recent business theory suggests that having a more diverse workforce allows a company to connect better to diverse customers. But does greater diversity produce better business outcomes in practice? More robust analysis is needed. And does separation of the roles of CEO and Board Chair lead to better decision making and greater profitability? Again, empirical work on this question is starting to appear, but more careful statistical studies would help to sharpen the conclusion.

Some of the problem with demonstrating a correlation between sustainability leadership and stock market results goes beyond a lack of careful and disaggregated empirical analysis. As Lubin and Esty have argued, existing ESG frameworks provide little in the way of signals about a company's potential for sustainability-driven growth or productivity gains.⁷¹ Most ESG metrics focus on risks and reputation rather than gauging the *upside* promise of sustainability leadership to drive top-line or bottom-line growth. A small number of companies (including the soon-to-be-combined Dow and DuPont) have begun to report on how their sustainability initiatives are delivering value. But there needs to be much more work done to develop widely-reported metrics that cover sustainability-related value drivers.

IV. CONCLUSION

Progress on the three fronts discussed in Part III above will provide the foundation for solving the puzzle put forward at the outset of this paper. Specifically, clarity on investor goals matched with a framework of ESG metrics that meet a high standard of methodological rigor would enable systematic analysis of the relationship between various elements of sustainability and marketplace results. Conceptual clarity, better metrics, and more analysis would make it easier for investors to understand when to expect a return on sustainability leadership – and when not to. Disaggregating the concept of sustainability and developing metric-by-metric (issue by issue) analyses of the relationship between particular elements of ESG performance would also facilitate development of “mass customization” portfolio construction tools that would allow investment managers to provide individual investors (with their unique set of sustainability interests and priorities) investment vehicles aligned with their own precise values and choices.

With a sharper picture of the elements of sustainability that translate into superior financial performance, better data, and scorecards designed with specific investment purposes in mind, more mainstream investors may find that some degree of sustainability assessment makes sense as part of their market analysis. Further work to isolate the elements of sustainability leadership that correlate with marketplace success also needs to be done – building on more carefully structured metrics tied to measures of sustainability-related growth and productivity. As the issues highlighted in this article get addressed, the available sustainability metrics should evolve to the point where mainstream investors will have reliable indicators to guide their portfolio construction, and the growing number of market participants interested in “smart beta” investment strategies (that incorporate sustainability as one among several factors shaping

portfolio choices) will have the information they need to build a sustainability tilt into their analysis.⁷²

Notes

¹ Tracking error (sometimes called “active risk”) is defined as the divergence between a particular portfolio and the baseline investment framework against which it is benchmarked.

² The Six Principles of Responsible Investing are as follows: 1. We will incorporate ESG issues into *investment analysis* and decision-making processes; 2. We will be active owners and incorporate ESG issues into our ownership policies and practices; 3. We will seek appropriate disclosure on ESG issues by the entities in which we invest; 4. We will promote acceptance and implementation of the Principles within the investment industry; 5. We will work together to enhance our effectiveness in implementing the Principles; 6. We will each report on our activities and progress towards implementing the Principles. <https://www.unpri.org/about/the-six-principles>.

³ United Nations Principles of Responsible Investment, “Annual Report 2015: From Awareness to Impact,” https://www.unpri.org/download_report/9483.

⁴ Oliver Ralph, “Michael Bloomberg urges companies to reveal climate change impact,” *Financial Times*, February 9, 2016, <http://www.ft.com/intl/cms/s/0/15425194-cefd-11e5-92a1-c5e23ef99c77.html#axzz4621KU34k>.

⁵ Matt Turner, “Here is the letter the world's largest investor, BlackRock CEO Larry Fink, just sent to CEOs everywhere,” *Business Insider*, February 2, 2016, <http://www.businessinsider.com/blackrock-ceo-larry-fink-letter-to-sp-500-ceos-2016-2>.

⁶ Sustainability Accounting Standards Board, “Less is More: Materiality and Why it Matters,” <http://www.sasb.org/materiality/important/>.

⁷ Marc Orlitzky, Frank Schmidt, and Sara Rynes, “Corporate social and financial performance: A meta-analysis,” *Organization Studies*, 24/3 (2003): 403-441.

⁸ Robert Eccles, Ioannis Ioannou, and George Serafeim, “The Impact of Corporate Sustainability on Organizational Processes and Performance,” *Management Science*, 60/11 (2014): 2835–2857. See also Remi Trudel and June Cotte, “Does it Pay to be Good?” *MIT Sloan Management Review* (2009); Arian Borgers, Jeroen Derwall, Kees Koedijk, and Jenke ter Horst, “Stakeholder relations and stock returns: On errors in investors’ expectations and learning,” *Journal of Empirical Finance* 22 (2013): 159-175; Li Cai and Chaohua He, “Corporate Environmental Responsibility and Equity Prices,” *Journal of Business Ethics*, 125/4 (December 2014), 617-635; Elroy Dimson, E., Oguzhan Karakas, and Xi Li, “Active Ownership,” *Review of Financial Studies*, 28/10 (2015) (forthcoming).

⁹ Gordon Clark, Andreas Feiner and Michael Viehs, “From Stockholder to Stakeholder: How Sustainability Can Drive Financial Outperformance,” *University of Oxford* (September 2014), http://www.arabesque.com/index.php?tt_down=51e2de00a30f88872897824d3e211b11.

¹⁰ David J. Vogel, “Opportunities for and Limitations of Corporate Environmentalism,” in Bruce L. Hay et al., *Environmental Protection and the Social Responsibility of Firms: Perspectives from Law, Economic, and Business* (Washington: Resources for the Future, 2005).

¹¹ Alfred Marcus, *Innovations in Sustainability* (Cambridge: Cambridge University Press, 2015): 2.

¹² Alfred Marcus, *Innovations in Sustainability* (Cambridge: Cambridge University Press, 2015): 50-81.

¹³ Caroline Flammer, “Does product market competition foster corporate social responsibility? Evidence from trade liberalization,” *Strategic Management Journal*, 36(10) (2015), 1469-1485.

¹⁴ Michael Barnett, “Why stakeholders ignore firm misconduct a cognitive view,” *Journal of Management*, 40(3) (2014), 676-702.

¹⁵ Markus Kitzmueller and Jay Shimshack, “Economic perspectives on corporate social responsibility,” *Journal of Economic Literature*, 50(1) (2012), 51-84.

¹⁶ Isable Costa Lourenço, Jeffrey Lawrence Callen, Manuel Castelo Branco, and Jose Dias Curto, “The value relevance of reputation for sustainability leadership,” *Journal of Business Ethics*, 119(1) (2014), 17-28; Brent Kurapatskie and Nicole Darnall, “Which corporate sustainability activities are associated with greater financial payoffs?” *Business strategy and the environment*, 22(1) (2012), 49-61; Rashid Ameer and Radiah Othman, "Sustainability practices and corporate financial performance: A study based on the top global corporations." *Journal of Business Ethics* 108(1) (2012): 61-79.

¹⁷ Jan Endrikat, “Market reactions to corporate environmental performance related events: A meta-analytic consolidation of the empirical evidence,” *Journal of Business Ethics* (2015), 1-14.

¹⁸ Robert Klassen and Curtis McLaughlin, “The impact of environmental management on firm performance,” *Management Science*, 42 (1996), 1199–1214.

¹⁹ C. Joe Ueng, “The analysis of corporate governance policy and corporate financial performance,” *Journal of Economics and Finance* (2015), 1-10.

²⁰ Stuart Hart and Gautam Ahuja, “Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance,” *Business Strategy and the Environment*, 5 (1996), 1–57; Sandra Waddock and Stuart Graves, “The corporate social performance—financial performance link,” *Strategic Management Journal*, 18 (1997), 303–319.

²¹ Peter Clarkson, Yue Li, Gordon Richardson, and Florin Vasvari, “Does it really pay to be green? Determinants and consequences of proactive environmental strategies,” *Journal of Accounting and Public Policy*, 20 (2011), 122–144.

²² Daniel C. Esty and Andrew Winston, *Green to Gold: How Smart Companies Use Environmental Strategy to Innovate, Create Value and Build Competitive Advantage* (Hoboken, NJ: Wiley, 2009); Daniel C. Esty and P.J. Simmons, *The Green to Gold Business Playbook* (2011); Forrest Reinhardt, *Down to Earth: Applying Business Principles to Environmental Management* (Cambridge: Harvard Business Review Press, 2000); Paul Hawken, Amory Lovins, and Hunter Lovins, *Natural Capitalism: Creating the Next Industrial Revolution* (US Green Building Council, 2000); William McDonough and Michael Baungart, *Cradle to Cradle: Remaking the Way We Make Things* (New York: North Point Press, 2002); Andrew Savitz, *The Triple Bottom Line: How Today's Best-Run Companies Are Achieving Economic, Social and Environmental Success -- and How You Can Too* (San Francisco, CA: John Wiley & Sons, 2006), Ray Anderson, *Confessions of a Radical Industrialist: Profits, People, Purpose--Doing Business by Respecting the Earth* (New York: St. Martin's Press, 2009).

²³ David Vogel, *The Market for Virtue: The Potential and Limits of Corporate Social Responsibility* (Washington D.C.: Brookings Institution Press, 2005).

²⁴ For studies critiquing the link between corporate responsibility and marketplace performance, see D.J. Vogel, “Is There a Market for Virtue? The Business Case for Corporate Social Responsibility,” *California Management Review*, 47/4 (2005): 19-45, stating, “...the business case for CSR is weak. The results of studies that seek to correlate social and financial performance are inconclusive: socially responsible investment funds perform no better than non-socially screened funds and many relatively responsible companies have not been financially

successful”; Andrew Crane, Guido Palazzo, Laura J. Spence, and Dirk Matten, “Contesting the Value of ‘Creating Shared Value’,” *California Management Review* 56/2 (2014): 130-153; Subhabrata Bobby Banerjee, *Corporate Social Responsibility: The Good, The Bad and the Ugly* (Northampton, MA: Edward Elgar, 2007); Peter Fleming and Marc T. Jones, *The End of Corporate Social Responsibility* (London, UK: Sage, 2013).

²⁵ Marc Orlitzky, “Corporate social responsibility, noise, and stock market volatility,” *The Academy of Management Perspectives*, 27(3) (2013), 238-254.

²⁶ See “performance frontier” analysis in Robert G. Eccles and George Serafeim, “The Performance Frontier: Innovating for a Sustainable Strategy,” *Harvard Business Review*, (May 2013): 52.

²⁷ Li Cai and Chaohua He, “Corporate environmental responsibility and equity prices,” *Journal of Business Ethics*, 125(4) (2014), 617-635; Yongtae Kim and Meir Statman, “Do corporations invest enough in environmental responsibility?” *Journal of Business Ethics*, 105(1) (2012), 115-129.

²⁸ MSCI ESG Research Inc., “MSCI ESG Sustainable Impact Metrics,” (2016) https://www.msci.com/documents/1296102/1636401/ESG_ImpactMetrics-2016.pdf/0902a64f-af8d-4296-beaa-d105b7d74dc3.

²⁹ MSCI ESG Research Inc., “MSCI ESG Research Fund,” (2016) https://www.msci.com/documents/10199/242721/MSCI_ESG_FundMetrics_Productsheet.pdf/731c6d72-3c21-4aae-8fc1-5b864b057da3.

³⁰ MSCI ESG Research Inc., “MSCI ESG Ratings,” (2016) https://www.msci.com/documents/1296102/1636401/MSCI_ESG_Ratings.pdf/9f0a999b-4419-4a0a-b6ef-0248f40ca2c9.

³¹ MSCI ESG Research Inc., “MSCI Carbon and CleanTech Tools,” (2016) https://www.msci.com/documents/1296102/1636401/MSCI_ESG_Carbon_Metrics_June2015.pdf/42211287-241c-4344-8b36-628501499f54.

³² Bloomberg Professional, (2016) <http://www.bloomberg.com/professional/equities/>.

³³ Thomson Reuters, “Thomson Reuters ESG Data,” (2016) <http://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/financial/esg-research-brochure.pdf>.

³⁴ Matteo Tonello, “Reporting on Corporate Sustainability Performance,” *Harvard Law School Forum on Corporate Governance and Financial Regulation*, December 6, 2012. <https://corpgov.law.harvard.edu/2012/12/06/reporting-on-corporate-sustainability-performance/>.

³⁵ Luc Renneboog, Jenke Ter Horst, and Chendi Zhang, “The price of ethics and stakeholder governance: evidence from socially responsible mutual funds,” *Journal of Corporate Finance*, 14/3 (2008): 302–332.

³⁶ Generation Foundation, “Allocating Capital for Long-Term Returns,” (May 2015) and interviews with: David Blood (co-founder, Generation Capital), September 2014; Brent Kessel (founder and co-CEO, Abacus Wealth Partners), February 2015; John Goldstein (co-founder, Imprint Capital), April 2015. The participants in the April 2015 Yale Corporate Sustainability Metrics Conference also confirmed this observation.

³⁷ Malin Arvidson, Fergus Lyon, Stephen McKay, and Domenico Moro, “The ambitions and challenges of SROI,” Middlesex University London, Working Paper (2010); Ross Millar and Kelly Hall, “Social return on investment (SROI) and performance measurement: The

opportunities and barriers for social enterprises in health and social care,” *Public Management Review*, 15(6) (2013), 923-941.

³⁸ David Philipp, “Stanford to divest from coal companies,” *Stanford Report* (May 6, 2014) <http://news.stanford.edu/news/2014/may/divest-coal-trustees-050714.html>. But questions have been raised about whether Stanford actually held any coal interests that were sold – and thus about the meaningfulness of this divestment approach.

³⁹ Larry Gordon, “UC sells off \$200 million in coal and oil sands investment,” *LA Times* (October 9, 2015) <http://www.latimes.com/local/education/la-me-ln-uc-coal-20150909-story.html>.

⁴⁰ Damian Carrington, “Norway confirms \$900bn sovereign wealth fund's major coal divestment,” *The Guardian* (June 5, 2015) <http://www.theguardian.com/environment/2015/jun/05/norways-pension-fund-to-divest-8bn-from-coal-a-new-analysis-shows>.

⁴¹ NRG Energy, “2014 Sustainability Report: Sustainability in Action,” http://www.nrg.com/documents/sustainability/2014_report_nrg_sustainability.pdf.

⁴² Dow, “Our 2015 Sustainability Goals,” <http://www.dow.com/en-us/science-and-sustainability/sustainability-reporting/sustainable-chemistry/>.

⁴³ David Lubin and Daniel Esty, “The Sustainability Imperative,” *Harvard Business Review* (2010).

⁴⁴ Salesforce, “Salesforce.com and the Environment: Reducing Carbon Emissions in the Cloud,” https://www.salesforce.com/assets/pdf/misc/WP_WSP_Salesforce_Environment.pdf.

⁴⁵ David Lubin and Daniel Esty, “Sustainability: Bridging the Sustainability Gap,” *MIT Sloan Management Review* (June 2014).

⁴⁶ Mozaffar Kahn, George Serafeim, and Aaron Yoon, “Corporate Sustainability: First Evidence on Materiality,” *Harvard Business School Working Paper #15-073* (2015).

⁴⁷ For more information, see the Global Reporting Initiative’s website, <https://www.globalreporting.org/Pages/default.aspx>; AccountAbility, “Redefining Materiality II: Why it Matters, Who’s Involved, and What It Means for Corporate Leaders and Boards”, August 2013, http://www.accountability.org/images/content/6/8/686/aa_materiality_report_aug2013%20final.pdf.

⁴⁸ Global Environmental Management Institute, “Quick Guide: Materiality”, September 2015 <http://gemi.org/wp-content/uploads/2015/09/GEMI-MaterialityQuickGuide-2015.pdf>.

⁴⁹ Sustainability Accounting Standards Board, “Materiality,” <http://www.sasb.org/materiality/important/>.

⁵⁰ Global Reporting Initiative, “G4 Sustainability Reporting Guidelines,” <https://www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf>.

⁵¹ Ebrahim and Rangan have argued that an overload of measurements provided for funders may help, but “it runs the risk of being counterproductive in the long run, both by drawing precious resources away from services and by putting too much emphasis on outcomes for which the causal links are unclear...” Alnoor Ebrahim and V. Kasturi Rangan, “What Impact?: A Framework for Measuring the Scale and Scope of Social Performance,” *California Management Review*, 56/3 (2014): 118-141.

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- ⁵² S. Douglas Beets and Christopher C. Souther, “Corporate Environmental Reports: The Need for Standards and an Environmental Assurance Service,” *Accounting Horizons*, 13/2 (1999): 129-145.
- ⁵³ Peter Clarkson, Michael Overell, and Larelle Law Chapple, “Environmental reporting and its relation to corporate environmental performance,” *ABACUS*, 47/1 (2011): 27-60.
- ⁵⁴ KPMG, “Survey of Corporate Responsibility Reporting 2013,” <http://www.kpmg.com/sustainability>.
- ⁵⁵ Graham Hubbard, “Measuring organisational performance: Beyond the triple bottom line,” *Business Strategy and Environment*, 19/3 (2009): 177-191.
- ⁵⁶ GRESB, “2015 Report,” https://www.gresb.com/results2015/global_trends.
- ⁵⁷ See the Global Reporting Initiatives’ database on sustainability disclosures for full list, <http://database.globalreporting.org/benchmark>.
- ⁵⁸ MSCI, “Executive Summary: Intangible Value Assessment (IVA) Methodology,” (December 2014), https://www.msci.com/resources/factsheets/IVA_Methodology_SUMMARY.pdf.
- ⁵⁹ Global sales value found at Forbes, “Coca-Cola,” <http://www.forbes.com/companies/coca-cola/>.
- ⁶⁰ Aaron Chan, Prerna Chatterjee, Chris Economides, Leslie Faulkner, Dianne Heiler, Katherine Jones, Aditi Kolhekar, Maria Rendon, Carolyn Roose, Drew Sambol, Julian Seelan, Ashi Soni, Martin Uriaga, and Jessica Prata, “Navigating Environmental, Social and Governance Data for Foundations,” *Columbia University MSSM Program* (2014), http://sustainability.ei.columbia.edu/files/2014/07/Navigating-ESG-Data-for-Foundations_FINAL.pdf.
- ⁶¹ See endnote 35, Renneboog et al. (2008)
- ⁶² See the SASB website for more information, <http://www.sasb.org>.
- ⁶³ See the Integrated Reporting website for more information, <http://www.integratedreporting.org>.
- ⁶⁴ See the Sustainability Insights Page for more information, <http://www.world-exchanges.org>.
- ⁶⁵ See endnote 46, Kahn et al. (2015).
- ⁶⁶ Global Reporting Initiative, 2014, G4 Sustainability Reporting Guidelines <https://www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf>.
- ⁶⁷ See Benjamin Hulac, “SEC considers overhaul to climate rule,” *E&E News*, April 15, 2016, <http://www.eenews.net/climatewire/2016/04/25/stories/1060036172>, describing the SEC’s April announcement that “it is considering modernizing disclosure requirements in a regulation called S-K to help investors see how companies approach social issues like global warming.”
- ⁶⁸ International Monetary Fund, Data Quality Assessment Framework <http://www.imf.org/external/np/sta/dsbb/2001/review.htm>.
- ⁶⁹ Bank of England, Statistics and Regulatory Data Division, Data Quality Framework, March 2014, <http://www.bankofengland.co.uk/statistics/Documents/about/dqf.pdf>.
- ⁷⁰ See endnote 46, Kahn et al. (2015).
- ⁷¹ See endnote 43, Lubin and Esty (2010).
- ⁷² Cary Krosinsky and Nick Robins, “Sustainable Investing: The Art of Long-Term Performance,” *Earthscan* (New York, NY: Taylor & Francis, 2008); Laura Gottsman and Jon

Kessler, "Smart Screened Investments: Environmentally Screened Equity Funds that Perform like Conventional Funds," *The Journal of Investing* 7(3) (1998), 15-24.