

Harnessing Investor Interest in Sustainability: The Next Frontier in Environmental Information Regulation

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This Article rethinks the theory and application of environmental information regulation in light of growing investor interest in sustainability. Academics and policymakers have long viewed mandatory information disclosure as a powerful regulatory tool for improving corporate environmental performance, with some going so far as to call environmental information regulation the third phase of American environmental law. Current thinking on environmental information regulation has failed, however, to keep pace with recent transformations in the investment community. Over the past decade, sustainable investing has rapidly moved from the fringes of the investment world to the mainstream as an increasing number of investors seek to align their values with the holdings of their portfolios. We argue that environmental information regulation, in the form of a mandatory corporate environmental, social, and governance (ESG) disclosure regime, could significantly facilitate this broader realignment of capital markets with sustainability principles. As we explain, standard models of environmental information regulation are ill-equipped to address the information needs of today's investment community. Instead, this Article calls for a new design of environmental information regulation capable of harnessing mainstream investor interest in sustainability—and, in doing so, creating a new vector of leverage in support of a sustainable future for our society.

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Introduction

Regulators and legal scholars have long recognized the potential of information regulation to further environmental policy goals.¹ The elegance of such a regulatory strategy lies in its harnessing of private actors to incentivize improved corporate environmental performance.² According to the established theory, environmental information regulation deploys mandatory disclosure requirements to generate new, publicly accessible data that allow investors, consumers, and civic society to compare and rank companies across an array of environmental measures or “metrics.”³ In response, markets punish

1. David W. Case, *Corporate Environmental Reporting as Informational Regulation: A Law & Economics Perspective*, 76 U. COLO. L. REV. 379, 381-82 (2005) (“[I]nformational regulation emerged . . . as a potential success story in the pursuit of alternatives to command-and-control environmental regulation.”); Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 GEO. L.J. 257, 260 (2001) (describing “the systematic use of *performance monitoring* and *benchmarking* as regulatory tools” as a “watershed” moment for environmental regulation); Paul R. Kleindorfer & Eric W. Orts, *Informational Regulation of Environmental Risks*, 18 RISK ANALYSIS 155, 156 (1998) (noting that “[a] shift toward increasing reliance on informational regulation . . . has begun in the environmental arena”); Cass R. Sunstein, *Informational Regulation and Informational Standing: Akins and Beyond*, 147 U. PA. L. REV. 613, 619 (1999) (commenting on the potential of environmental information regulation to alter corporate behavior). Indeed, some have gone so far as to call information regulation “phase three” of American environmental law. See Tom Tietenberg & David Wheeler, *Empowering the Community: Information Strategies for Pollution Control*, in *FRONTIERS OF ENVIRONMENTAL ECONOMICS* 85, 86 (Henk Folmer et al. eds., 2001).

2. See *infra* Section I.A. Environmental information regulation may also apply to public entities. The National Environmental Policy Act (NEPA), for example, requires federal agencies to produce environmental impact statements for major federal actions significantly affecting the quality of the human environment. 42 U.S.C. § 4332 (2018); see also Sarah E. Light, *NEPA’s Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 TUL. L. REV. 511, 511 (2013) (classifying NEPA as a form of information regulation); Lauren Giles Wishnie, *NEPA for a New Century: Climate Change and the Reform of the National Environmental Policy Act*, 16 N.Y.U. ENVTL. L.J. 628, 631 (2008) (describing how NEPA functions as information regulation). In addition, information regulation can come in the form of sustainable labeling requirements for consumer goods. See Daniel C. Esty, *Next Generation Environmental Law: A Response to Richard Stewart*, 29 CAP. U. L. REV. 183, 195 (2001) (discussing the potential of “eco-labels [to] now steer green-conscious consumers to environmentally superior products”). This Article, however, focuses on environmental information regulation as applied to private firms. Due to the investor community’s recent and dramatic growth in interest in sustainable investing, the time is particularly ripe to rethink the design of environmental disclosure requirements for companies. See *infra* Section II.B.

3. In this Article, a “metric” refers to a measurement or indicator that tracks a company’s performance on an issue of interest. See Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115, 166 (2004) (explaining how comparative environmental metrics can guide environmental action in the corporate context); Karkkainen, *supra* note 1, at 261 (discussing how performance monitoring and benchmarking encourage firms to “compare, rank, and track [their environmental] performance among production processes, facilities, operating units, and peer or competitor firms”).

environmental laggards, viewing poor environmental performance as a financial liability.⁴ The same data also allow firms to learn from their peers and to identify and remedy previously unknown inefficiencies in their supply chains, production processes, and management strategies.⁵ In this way, environmental information regulation creates both internal and external incentives for firms to improve their environmental management practices—all with minimal direct involvement by government regulators.⁶

Current theories and applications of environmental information regulation, however, fail to tap the full potential of this regulatory strategy to advance environmental objectives. To date, policymakers and academics have viewed information regulation solely as a tool for driving markets *away* from environmental *laggards*.⁷ But few have grasped the important role that

4. See Archon Fung & Dara O'Rourke, *Reinventing Environmental Regulation from the Grassroots Up: Explaining and Expanding the Success of the Toxics Release Inventory*, 25 ENVTL. MGMT. 115, 120-23 (2000) (explaining how the Toxic Release Information program—one of the most prominent examples of environmental information regulation—induces emissions reductions by “blacklisting” the worst-performing firms); James T. Hamilton, *Pollution as News: Media and Stock Market Reactions to the Toxics Release Inventory Data*, 28 J. ENVTL. ECON. & MGMT. 98, 112 (1995) (finding empirical evidence that toxic-waste disclosures reduce the stock market prices of high-polluting firms); Shameek Konar & Mark A. Cohen, *Information as Regulation: The Effect of Community Right to Know Laws on Toxic Emissions*, 32 J. ENVTL. ECON. & MGMT. 109, 110 (1997) (explaining how public disclosure of “bad information leads markets to punish firms that are bad actors” (internal quotation marks omitted)); Marc Orlitzky, *Corporate Social Performance and Financial Performance: A Research Synthesis*, in THE OXFORD HANDBOOK OF CORPORATE SOCIAL RESPONSIBILITY 5-6 (Andrew Crane et al. eds., 2008) (discussing how negative environmental publicity can damage corporate reputation and brand name).

5. See Daniel C. Esty, *Measurement Matters: Toward Data-Driven Environmental Policymaking*, in ROUTLEDGE HANDBOOK ON SUSTAINABILITY INDICATORS (Simon Bell & Steve Morse eds., forthcoming 2018); see also Daniel C. Esty & Reece Rushing, *Governing by the Numbers: The Promise of Data-Driven Policymaking in the Information Age*, CTR. FOR AM. PROGRESS 2 (2006), https://cdn.americanprogress.org/wp-content/uploads/issues/2007/04/pdf/data_driven_policy_report.pdf [<https://perma.cc/A7FX-VA7Y>] (explaining how comparative benchmarking can lead to peer-to-peer learning); Konar & Cohen, *supra* note 4, at 112 (discussing how internal monitoring of pollution can improve firm efficiency).

6. David W. Case, *The Law and Economics of Environmental Information as Regulation*, 31 ENVTL. L. REV. 10,773, 10,773 (2001) (“[I]nformation disclosure has emerged as a key component of strategies to promote more effective, less costly alternatives to command-and-control regulation.”); Madhu Khanna et al., *Toxics Release Information: A Policy Tool for Environmental Protection*, 36 J. ENVTL. ECON. & MGMT. 243, 245 (1998) (framing environmental information regulation as “an innovative effort to reduce the role of big government bureaucracy and engage private sector participation in regulating the environment”); Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 131 (2001) (explaining how information regulation and other innovative policies have begun to shift environmental regulation away from government-centered regulation and toward “self-regulation”).

7. See, e.g., Mark A. Cohen, *Information as a Policy Instrument in Protecting the Environment: What Have We Learned?*, 31 ENVTL. L. REP. 10425, 10425-27 (Apr. 2001) (focusing on how information disclosures that spotlight environmental laggards can induce better environmental performance); Karkkainen, *supra* note 1, at 295 (focusing primarily on how information regulation can “exert powerful pressures on poor performers to up-grade their [environmental] performance”); Konar & Cohen, *supra* note 4, at 111 (explaining how information disclosure requirements under EPA’s Toxic Release inventory can induce better corporate environmental performance by harnessing consumers, investors, and the public to penalize the worst performers in an industry); Stewart, *supra* note 6, at 139 (suggesting that mandatory disclosure programs are most appropriate for negative environmental information); Adam Sulkowski & Steven White, *Financial Performance, Pollution Measures, and the Propensity to Use Corporate Responsibility Reporting: Implications for Business and Legal Scholarship*,

information regulation can play in guiding markets *toward* environmental *leaders*.⁸ Thus, in both theory and practice, mandatory disclosure regimes have worked to spotlight bad environmental performance and thereby create a series of informational *red lights* that warn consumers and investors about the worst actors in an industry. They do not, however, provide a companion set of informational *green lights* capable of identifying and rewarding the best actors in an industry.⁹

While this red-lights model of environmental information regulation may have sufficed in the past, it has become outdated due to the growing investor-community interest in sustainability—a concept that broadly encompasses a host of interconnected environmental, social, and governance (ESG) issues.¹⁰ Until recently, sustainable investing has operated on the fringes of the investment world, appropriate only for a few “socially responsible” investors who exclude bad actors from their portfolios, often with little or no regard for the impact on their investment returns.¹¹ The past decade, however, has witnessed a groundswell of interest in sustainability among mainstream investors.¹² These

21 COLO. J. INT’L ENVTL. L. & POL’Y 491, 503 (2010) (explaining how disclosure programs can lead to “bad actors being punished by investors and consumers for creating risks and liabilities”); Shameek Konar & Mark A. Cohen, *Why Do Firms Pollute (and Reduce) Toxic Emissions?* 11-16 (OECD Working Paper 19971), <https://www.oecd.org/env/outreach/33947723.pdf> [<https://perma.cc/Y7HD-55GB>] (focusing on how mandatory disclosure can use the threat of “negative publicity” to incentivize better environmental performance).

8. See *infra* Section I.B.

9. This Article builds on Professor Esty’s earlier calls to shift American environmental law away from a regulatory framework that “centers on telling people what they cannot do, to a broader structure of incentives and ‘green lights’ that would engage the public and the business world in environmental problem solving.” Daniel C. Esty, *Red Lights to Green Lights: From 20th Century Environmental Regulation to 21st Century Sustainability*, 47 ENVTL. L. REV. 1, 1-2 (2017).

10. There is no definitive definition of sustainability. At its broadest level, sustainability can be understood as a set of environmental, economic, and social issues that must be addressed to “meet[] the needs of the present without compromising the ability of future generations to meet their own needs.” WORLD COMM’N ON ENV’T & DEV., OUR COMMON FUTURE 43-46 (1987). In the investor context, sustainability often has been operationalized as nonexhaustive lists of environmental, social, and governance issues that include some of the following characteristics: “issues that have traditionally been considered non-financial or non-material; a medium- or long-term time horizon; qualitative objectives that are readily quantifiable in monetary terms; externalities (costs borne by other firms or by society at large) not well captured by market mechanisms; a changing regulatory or policy framework; patterns arising throughout a company’s supply chain (and therefore susceptible to unknown risks); [and] a public-concern focus.” Mercer Inv. Consulting, *Glossary*, in SUSTAINABLE INVESTING: THE ART OF LONG-TERM PERFORMANCE 214 (Cary Krosinsky & Nick Robins eds., 2008).

11. See *infra* Section II.B.

12. Timo Busch et al., *Sustainable Development and Financial Markets: Old Paths and New Avenues*, 55 BUS. & SOC’Y 303, 304 (2015) (reporting that “the market share of sustainable investments . . . has been growing in recent years . . . and is further expected to increase”) (internal quotations omitted); *2016 Trends Report Highlights*, US SIF 1 (2016), <https://www.ussif.org/files/Trends/US%20SIF%202016%20Trends%20Overview.pdf> [<https://perma.cc/3ADS-4WAB>] (showing remarkable growth in sustainable investments in the United States since 1995); Libby Bernick, *ESG Moves from the Margins to the Mainstream*, GREENBIZ (Jan. 22, 2018, 1:45 AM), <https://www.greenbiz.com/article/esg-moves-margins-mainstream> [<https://perma.cc/BW9K-2D4W>] (documenting the growth of interest in sustainable investing); Gordon L. Clark et al., *From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance*, ARABESQUE PARTNERS 10 (Mar. 2015),

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investors also want to integrate sustainability considerations into their portfolio design, but they differ from socially responsible investors in at least two important respects.¹³ First, they are interested not only in divesting from sustainability laggards but also in investing in sustainability leaders. Second, they care about maintaining robust portfolio returns. They therefore eschew the crude “negative exclusion” strategies of past socially responsible investors and instead seek to bring a *sustainability tilt* to their portfolios that is finely calibrated to their own desired levels of sustainability and financial returns.¹⁴

This Article calls for a new model of information regulation to harness the growing interest in sustainability among mainstream investors. While scholars have tended to focus on *environmental* information regulation, the policy logic and potential of this regulatory strategy applies with equal force to the broader *sustainability* concerns that are driving these trends in mainstream ESG investing. However, the traditional conception and design of environmental information regulation is ill-suited for the mainstream investing community. Specifically, the red-lights model—with its focus on sustainability laggards and its lack of focus on sustainability issues that are material to corporate financial performance—caters to the priorities and preferences of a relatively narrow set of socially responsible investors.¹⁵ By contrast, an expanding number of mainstream investors seek a set of corporate sustainability metrics that are tightly linked to business fundamentals and that will allow them to both mitigate the risk downsides of unsustainable management practices and exploit the growth and productivity upsides of sustainability leadership.¹⁶ While existing voluntary

https://arabesque.com/research/From_the_stockholder_to_the_stakeholder_web.pdf [https://perma.cc/B87T-L7AG] (calling sustainability “one of the most significant trends in financial markets for decades”); *Investment Review 2016*, GLOBAL SUSTAINABLE INV. ALLIANCE (2016), http://www.gsi-alliance.org/wp-content/uploads/2017/03/GSIR_Review2016.F.pdf [https://perma.cc/577B-3XMK] (discussing recent trends in global sustainable investing); Doug Morrow & Michael Yow, *Measuring Sustainability Disclosure: Ranking the World’s Stock Exchanges*, CORP. KNIGHTS CAP. 5 (2016), <http://www.sseinitiative.org/wp-content/uploads/2016/07/SSE2016Final.pdf> [https://perma.cc/LL5W-HWZ2] (discussing “investors’ growing interest in building sustainable investment strategies”); *Sustainable Investment Joins the Mainstream*, THE ECONOMIST (Nov. 25, 2017), <https://www.economist.com/finance-and-economics/2017/11/25/sustainable-investment-joins-the-mainstream> [https://perma.cc/QT7U-SJQV] (same).

13. See *infra* Section II.B.

14. See Daniel C. Esty & Todd Cort, *Corporate Sustainability Metrics: What Investors Need and Don’t Get*, 8 J. ENVTL. INVESTING 13, 23 (2017) (creating a typology of today’s sustainability-minded investors); Elizabeth Lewis et al., *Navigating the Sustainable Investment Landscape*, WORLD RESOURCES INST. 21 (2016), https://www.wri.org/sites/default/files/Navigating_the_Sustainable_Investment_Landscape.pdf [https://perma.cc/SZB8-KA9M] (describing a range of strategies used by investors to integrate sustainability considerations into their portfolios); Gregory Stewart et al., *Trends in Environmental, Social, and Governance Investing*, BNY MELLON 11-12 (2012), <http://www.greeneaglefinancial.com/files/67976/BNYMellon.pdf> [https://perma.cc/H94G-SLVR] (same).

15. See *infra* Section II.C.

16. See David A. Lubin & Daniel C. Esty, *The Sustainability Imperative*, HARV. BUS. REV. (May 2010), <https://hbr.org/2010/05/the-sustainability-imperative> [https://perma.cc/WY3V-UH5E] (discussing how sustainability trends will fundamentally reshape the business landscape). See generally DANIEL C. ESTY & ANDREW S. WINSTON, *GREEN TO GOLD* (2009) (documenting a spectrum of “green-

sustainability disclosure frameworks have taken key steps toward satisfying these informational demands, this Article argues that they are not sufficient—nor will they become sufficient—due to the public goods nature of sustainability information.¹⁷ Instead, today’s informational barriers to sustainable investing are best addressed through a *mandatory* disclosure regime that provides investors with a menu of material sustainability metrics capable of distinguishing sustainability leaders from laggards.¹⁸

In this way, the Article seeks to adapt and update the theory and insights of environmental information regulation to the needs and realities of today’s investing community. As such, the Article is primarily concerned with the environmental dimensions of sustainability. Nevertheless, it is important to note that mainstream investor interest in sustainability extends beyond environmental concerns to encompass the social and governance aspects of sustainability. Thus, while some of these investors care about the environmental issues that have traditionally been the focus of environmental law scholars, such as greenhouse gas emissions, energy consumption, water pollution, toxic waste, and biodiversity, others have broader interests. Some focus on corporate governance issues—e.g., board composition, corporate transparency, executive compensation, and human resources management. And others want to track corporate performance on an even broader array of social issues—e.g., consumer protection, poverty, health care, human rights, and workplace diversity. Harnessing investor interest in sustainability therefore requires a disclosure framework that accounts for the entire spectrum of environmental, social, and governance issues that underpin the concept of sustainability. Accordingly, this Article advocates for a shift from environmental information regulation to a broader form of sustainability information regulation.

The Article proceeds as follows. Part I reviews the current thinking on environmental information regulation—highlighting, in particular, the dominance of the red-lights model. Part II then describes the investment world’s recent shift toward sustainability. It argues that today’s sustainability disclosure regimes do not satisfy the informational needs of mainstream investors. As a result, investors’ interest in sustainability has outstripped their adoption of sustainable investing practices. To overcome informational barriers and better align capital markets with sustainability goals, Part III calls on academics and

to-gold” opportunities wherein sustainability investments can translate into higher profits); Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97 (1995) (discussing how better corporate environmental management can improve corporate financial performance). As discussed below in Section II.A *infra*, substantial empirical work supports the hypothesis that some forms of sustainability leadership can enhance firm productivity and revenue growth. See, e.g., Gunnar Friede et al., *ESG and Financial Performance: Aggregated Evidence from More than 2000 Empirical Studies*, 5 J. SUSTAINABLE FIN. & INV. 210, 210 (2015) (reporting positive relationships between corporate environmental performance and corporate financial performance based on meta-analyses of more than two thousand empirical studies).

17. See *infra* Sections II.C, III.A.

18. See *infra* Section III.B.

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regulators to move beyond the red-lights model of information regulation and to develop a combined red-lights/green-lights model tailored to the needs and priorities of mainstream investors. To begin, it argues for a mandatory disclosure framework to overcome the under-reporting and methodological problems that plague the many voluntary sustainability disclosure standards developed by nongovernmental organizations (NGOs) and commercial ESG data providers. It then outlines several core principles for designing the optimal sustainability information regulation for mainstream investors before arguing that the benefits of this regulation outweigh its costs. Part IV concludes with a call for policy action to develop the sustainability disclosure framework outlined in the prior sections.

I. Current Thinking on Environmental Information Regulation

This Part reviews the standard model of environmental information regulation. Section I.A explains how mandatory disclosure requirements incentivize companies to improve environmental practices and outcomes. Section I.B then argues that academics and regulators have largely understood environmental information regulation as a tool for driving markets away from environmental laggards but not necessarily toward environmental leaders.

A. How It Works

Economists and legal scholars have identified several ways in which mandatory disclosure of environmental data can induce better corporate environmental performance. First, the data may reveal production inefficiencies that were previously unknown to corporate management.¹⁹ Such insights may stem from the firm's analysis of its own data.²⁰ Or they may come when a firm uses the data to compare its environmental performance to those of its competitors.²¹ If, for example, a company produces far more toxic waste than its

19. Cohen, *supra* note 7, at 10427 (discussing how corporate environmental managers use “this information . . . in setting priorities and looking for areas where a company might be able to improve its environmental performance”); Esty, *supra* note 3, at 166 (“In the corporate context, environmental metrics allow executives to evaluate their pollution control and resource management practices with rigor. Facility-specific data can be used to identify top-tier performance, establish targets for progress, and provide a foundation for programs to move a corporation’s operations toward leading-edge standards.”); Karkkainen, *supra* note 1, at 297; *see also* Daniel C. Esty & Michael E. Porter, *Industrial Ecology and Competitiveness*, 2 J. IND. ECOL. 36-39 (1998) (explaining how firms can improve productivity by identifying and eliminating previously unknown waste streams).

20. Louis Lowenstein, *Financial Transparency and Corporate Governance: You Manage What You Measure*, 96 COLUM. L. REV. 1335, 1342 (1996) (observing that companies “manage what [they] measure” and arguing that mandatory disclosure can have the “effect of forcing managers to confront disagreeable realities”).

21. ESTY & RUSHING, *supra* note 5, at 34 (discussing how “comparative analysis that measures the relative performance of peers . . . promotes collective learning by spotlighting the most effective strategies that should be expanded, as well as ineffective strategies that should be avoided”); Esty, *supra* note 5 (examining how comparative benchmarking across firms can improve environmental performance outcomes).

peers, this gap may point to opportunities for the firm to improve its resource use, cut regulatory costs, and thereby enhance its operational efficiency.²²

In addition to these *internal* pressures to improve environmental performance, information regulations can create *external* pressures from interested stakeholders.²³ Investors, for example, may view a low ranking on an environmental metric as a financial risk—either because it signals that the firm’s underlying operations are inefficient and wasteful or because it foreshadows potential legal risks in the form of future tort suits or increased scrutiny from regulators.²⁴ As such, mandatory disclosure of new environmental data may drive profit-focused investors away from firms that are shown to be particularly harmful to the environment.²⁵ Even if the link between sustainability performance and financial results is not entirely clear, a growing number of mainstream investors want greater alignment between their portfolio holdings and their values.

Information disclosure can alter corporate behavior through consumer and employee channels as well.²⁶ Revelations that a firm has engaged in environmentally harmful activities can damage its reputation and brand name.²⁷ As a result, the company risks not only losing customers (particularly those willing to pay a premium for eco-friendly products) but also triggering NGO denunciations or even consumer boycotts.²⁸ Reputational damage may also

22. ESTY & RUSHING, *supra* note 5, at 34 (discussing how benchmarking can lead to peer-to-peer learning); Karkkainen, *supra* note 1, at 297 (describing how many corporate managers were “unaware of the volumes of toxic pollutants their firms were generating” and were “surprised by the information produced in the first rounds of [the Toxics Release Inventory]”); Konar & Cohen, *supra* note 4, at 112 (noting that pollution can serve “as a signal of the firm’s productive efficiency”).

23. Karkkainen, *supra* note 1, at 261 (describing the internal and external pressures to improve corporate environmental performance); Konar & Cohen, *supra* note 4, at 110 (“If consumers, community groups, or investors care about a firm’s emissions, providing more firm-specific environmental information may cause consumers to adjust their purchase decisions, community groups to pressure firms to reduce pollution beyond that required by federal laws, or investors to change their portfolios.”).

24. See Kleindorfer & Orts, *supra* note 1, at 165 (discussing how information regulation creates opportunities for tort-based lawsuits); Konar & Cohen, *supra* note 4, at 112 (theorizing that voluntary pollution reductions may deter lobbying by environmental groups for tighter regulatory standards); John W. Maxwell et al., *Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism*, 43 J.L. & ECON. 583, 583 (2000) (modeling the conditions under which firms will strategically self-regulate to preempt regulatory action).

25. Even if disclosure does not reveal new information on a firm’s expected financial performance, capital markets might still penalize environmental laggards if socially responsible investors—i.e., those who design their portfolios to promote their morals, rather than to maximize their returns—make up a large enough share of traders. However, such an outcome would imply that capital markets are not efficient. As discussed in Section III.C below, there is a long-standing debate over whether capital markets are, in fact, efficient.

26. See generally ESTY & WINSTON, *supra* note 16 (spelling out the multiple lines of logic for corporate sustainability strategies, including eco-efficiency, appeal to green consumers, and enhanced employee engagement in an increasingly sustainability-conscious world).

27. Konar & Cohen, *Why Do Firms Pollute (and Reduce) Toxic Emissions?*, *supra* note 7, at 13-14; Orlitzky, *supra* note 4, at 5-6.

28. Robert G. Eccles et al., *The Impact of Corporate Sustainability on Organizational Processes and Performance*, 60 MGMT. SCI. 2835, 2835 (2014); Robert Innes & Abdoul G. Sam,

impede a firm's ability to attract and retain high-quality talent, especially among millennials,²⁹ with implications for the firm's future performance.³⁰ Ultimately, the responses of capital, consumer, and labor markets to mandatory disclosures of environmental information can create reinforcing incentives for firms to curb their pollution and improve their environmental practices.³¹

Empirical research on the Environmental Protection Agency's (EPA) Toxics Release Inventory (TRI) confirms that well-designed information regulations can improve corporate environmental performance.³² One of the most prominent and well-studied environmental disclosure policies to date, the TRI requires companies to publish standardized data on certain toxic chemical releases by industrial facilities.³³ Notably, analyses of the program's impacts show that the disclosures reduced the stock-market value of the regulated firms with higher-intensity polluters experiencing greater price drops.³⁴ This market penalty, in turn, appears to have induced the companies to improve their environmental performance. For example, those that experienced the greatest stock-price reductions (1) reported the greatest reductions in TRI-covered chemical releases in subsequent years, (2) made significant improvements in other (non-TRI) areas of environmental performance, and (3) were more likely to avoid government fines for environmental violations.³⁵ Notably, the incentive

Voluntary Pollution Reductions and the Enforcement of Environmental Law: An Empirical Study of the 33/50 Program, 51 J.L. & ECON. 271, 273 (2008).

29. See *3/4 of Millennials Would Take a Pay Cut to Work for Socially Responsible Company*, SUSTAINABLE BRANDS (Nov. 2, 2016), http://www.sustainablebrands.com/news_and_views/organizational_change/sustainable_brands/34_millennials_would_take_pay_cut_work_socially_responsible [https://perma.cc/5Z9M-4HJM] (describing survey results showing that seventy-five percent of millennials consider a company's social and environmental commitments when deciding where to work); Marissa Peretz, *Want to Engage Millennials? Try Corporate Social Responsibility*, FORBES (Sept. 27, 2017, 10:00 AM), <https://www.forbes.com/sites/marissaperetz/2017/09/27/want-to-engage-millennials-try-corporate-social-responsibility> [https://perma.cc/9M2R-H99E].

30. See, e.g., Kristin B. Backhaus et al., *Exploring the Relationship Between Corporate Social Performance and Employer Attractiveness*, 41 BUS. & SOC'Y 292, 292 (2002) (providing evidence that sustainability performance attracts higher-quality labor); Ante Glavas, *Corporate Social Responsibility and Employee Engagement: Enabling Employees to Employ More of Their Whole Selves at Work*, 7 FRONTIERS PSYCHOL. 1, 2 (2016) (reporting positive relationships between corporate social responsibility and employee engagement).

31. E.g., Karkkainen, *supra* note 1, at 328; Fung & O'Rourke, *supra* note 4, at 120-22.

32. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI program. Emergency Planning and Community Right-to-Know Act of 1986, Pub. L. No. 99-499, § 313, 100 Stat. 1728, 1741 (codified as amended at 42 U.S.C. § 11023 (2018)).

33. *Toxics Release Inventory (TRI) Program*, EPA, (Nov. 8, 2018), <https://www.epa.gov/toxics-release-inventory-tri-program> [https://perma.cc/Y9UR-VGWS].

34. Higher-intensity polluters are those that release more toxic waste per dollar of revenue. See Hamilton, *supra* note 4, at 112.

35. Case, *supra* note 6, at 10,777-79; see also Jeanne Herb et al., *Harnessing the "Power of Information": Environmental Right to Know as a Driver of Sound Environmental Policy, in NEW TOOLS FOR ENVIRONMENTAL PROTECTION: EDUCATION, INFORMATION, AND VOLUNTARY MEASURES* 254 (Thomas Dietz & Paul C. Stern eds., 2002) ("The U.S. General Accounting Office estimated that over half of all TRI reporting facilities made one or more operational changes as a consequence of the inventory program." (brackets omitted)).

to improve environmental performance did not subside after the first disclosure. Instead, markets appeared to continue penalizing poorly performing firms with each new disclosure of data,³⁶ even after it had become clear which firms polluted the most in a given industry.³⁷

The success of the TRI at inducing voluntary³⁸ pollution cuts has generated much speculation regarding the potential of information regulation to complement—or even substitute for—more traditional forms of environmental regulation.³⁹ As compared to command-and-control regulations, for example, information disclosure requirements offer a “lighter” regulatory approach that intrudes less noticeably into the sphere of private markets.⁴⁰ Instead of relying on agencies to police corporate behavior and set socially optimal environmental standards, information regulation relies on civil society, markets, and the public at large to (1) decide what constitutes “efficient” levels of pollution, (2) monitor corporate activities, and (3) penalize bad environmental actors.⁴¹ Furthermore, if the disclosed data allow for comparisons between firms and across time, information regulation can generate incentives for *continuous* environmental-performance progress because firms feel pressure to not only reduce emissions against their own baselines but also to improve their rankings relative to their peers.⁴² In contrast, scholars have criticized command-and-control regulations for failing to incentivize—and perhaps even disincentivizing—pollution

36. TRI disclosures occur annually. See *Basics of TRI Reporting*, EPA (Aug. 23, 2018), <https://www.epa.gov/toxics-release-inventory-tri-program/basics-tri-reporting> [https://perma.cc/2VBM-4FW6].

37. Khanna et al., *supra* note 6, at 245.

38. As used in this Article, “voluntary” means emissions reductions that exceed legal requirements. Of course, from the firm’s point of view, such reductions may not feel voluntary if they are undertaken in response to outside pressures from shareholders and customers.

39. See Case, *supra* note 6, at 10,773 (“A number of consensus-building forums, expert panels, and policy reports argue that public distribution of information can serve as an effective policy tool for driving improvements in environmental performance.”); Konar & Cohen, *supra* note 4, at 109-10 (“Information remedies have recently been touted as powerful supplements or alternatives to direct command-and-control regulation.”).

40. See e.g., Karkkainen, *supra* note 1, at 291-93 (documenting the cost advantages of the Toxic Release Inventory program over traditional command-and-control regulations); Case, *supra* note 6, at 10,773 (“[I]nformation disclosure has emerged as a key component of strategies to promote more effective, less costly alternatives to command-and-control regulation.”).

41. Professors Bruce Ackerman and Richard Stewart have discussed the difficulties that government agencies face when setting environmental standards. Bruce A. Ackerman & Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1342-43 (1985); Richard B. Stewart, *United States Environmental Regulation: A Failing Paradigm*, 15 J.L. & COM. 585, 587-88 (1996). Professor Esty has argued elsewhere that information-disclosure regimes can help shift the locus of environmental decisionmaking from government agencies to consumers, investors, and companies. Esty, *supra* note 9, at 27-28.

42. Karkkainen, *supra* note 1, at 261 (“Moreover, in contrast to fixed regulatory standards that effectively become performance ceilings as well as floors, TRI-induced benchmarking creates an implicit open-ended performance standard that demands continuous improvement in relation to one’s peers and to one’s own past performance.”); cf. ESTY & RUSHING, *supra* note 5, at 25 (arguing that comparative analysis and benchmarking can also incentivize governments to continuously improve on policy outcomes).

reductions beyond administratively mandated minimums.⁴³ In this way, information regulation begins to move away from government-centered regulation and toward marketplace-imposed discipline and “self-regulation.”⁴⁴

To be clear, information regulation is not a silver bullet for environmental problems. True, information regulation can improve Coasian bargaining over environmental rights by reducing an important element of transaction costs: information asymmetry.⁴⁵ But even if it eliminated information asymmetries entirely, society would still be far removed from the Coasian ideal—wherein private trading alone yields the socially efficient allocation of resources, regardless of the initial distribution of legal rights.⁴⁶ A plethora of other transaction costs ranging from wealth effects to collective action problems hinder the ability of markets to fully redress environmental harms.⁴⁷ Government action—above and beyond information disclosure requirements—is undoubtedly needed, including most importantly pricing the negative externalities produced by environmentally harmful behavior.⁴⁸ Indeed, even if information asymmetries were the sole market failure at play, it is unlikely that disclosure requirements would suffice due to limitations and biases in people’s abilities to process information and assess risk.⁴⁹ Thus, while information regulation can play an important role in furthering environmental goals, most scholars and policymakers see it as enhancing, rather than displacing, more traditional forms of environmental regulation.⁵⁰

43. See, e.g., Cass R. Sunstein, *Paradoxes of the Regulatory State*, 57 U. CHI. L. REV. 407, 420 (1990) (arguing that technology-feasibility standards under the Clean Air Act perversely discourage innovation). But see David Popp, *Innovation and Climate Policy*, 2 ANN. REV. RESOURCE ECON. 275, 283-84 (2010) (reviewing recent research that has complicated the perceived comparative effectiveness of market-based policies and command-and-control regimes at incentivizing innovation in pollution mitigation technologies).

44. Esty, *supra* note 9, at 37 (arguing for a shift away from “government-centered” environmental protection and toward involving more actors in environmental decisionmaking); Stewart, *supra* note 6, at 131 (“Self-regulation implies that an organization determines the means to reach environmental goals and, at least to some degree, the goals as well. Thus, government is less involved i[n] setting targets and[] often the program is voluntary.”). Notably, information regulation also promises to reduce the costs of regulation to government itself, since it shifts monitoring and standard-setting costs to markets, NGOs, and the media. See Karkkainen, *supra* note 1, at 261.

45. Kleindorfer & Orts, *supra* note 1, at 161; see also Esty, *supra* note 3, at 115 (“Inadequate information and related transaction costs make Coasian contractual exchanges of environmental rights infeasible in many circumstances.”); Steven G. Medema, *The Coase Theorem*, ENCYCLOPEDIA OF LAW & ECONOMICS 854 (2013) (identifying information asymmetries as a key transaction cost).

46. See generally Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960) (first articulating the Coase Theorem).

47. Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1483 (1998) (outlining these various transaction costs).

48. Esty & Cort, *supra* note 14, at 15 (stressing the limitations of information disclosure when regulations let externalities remain uninternalized).

49. See Stewart, *supra* note 6, at 141-42 (discussing these information-processing problems); Sunstein, *supra* note 1, at 626-29.

50. E.g., Case, *supra* note 1, at 387 (“[E]xtant scholarship reflects that disclosure strategies are imperfect substitutes for direct legal controls on environmental conduct.”); Peter W.

B. What It Should Focus On

To date, most academic analysts and regulators have viewed mandatory disclosure requirements as a tool for policing bad environmental conduct and for driving markets away from environmental laggards. In other words, they see the purpose of environmental information regulation as establishing a series of red lights that drive polluters to stop their harm-causing conduct—and incentivize environmental improvements by naming and shaming the worst performers in an industry.

Case in point: existing environmental information regulations are largely designed to produce data on the environmental harms, risks, and liabilities of firms at the bottom of the environmental performance distribution. For example, the Clean Air Act, the Clean Water Act, and other major federal environmental statutes require regulated entities to report on various pollution discharges to determine their compliance with *minimum* regulatory standards.⁵¹ Thus, these disclosure requirements aim to identify those who fall below specified, baseline performance thresholds rather than those who exceed them. Likewise, federal securities laws require publicly traded companies to disclose a variety of environmental liabilities, including the costs of compliance with environmental regulations, penalties incurred, and any litigation arising under environmental laws.⁵² Here again, information disclosure works primarily to separate environmental laggards from the pack. The same goes for environmental information regulations that target products sold on the market. These disclosure regimes, which take the form of product-labeling requirements, tend to focus on the product's environmental harms and risks.⁵³

In focusing on environmental harms, liabilities, and laggards, these information schemes incentivize environmental improvements primarily by penalizing the worst polluters.⁵⁴ This certainly has been the case for the TRI—

Kennedy et al., *Pollution Policy: The Role for Publicly Provided Information*, 26 J. ENVTL. ECON. & MGMT. 31, 42 (1994); Stewart, *supra* note 6, at 141.

51. Case, *supra* note 1, at 391-92.

52. *Id.* at 392.

53. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), for example, requires warning labels for hazardous pesticides. See 5 PLATER ET AL., ENVIRONMENTAL LAW & POLICY: NATURE, LAW, & SOCIETY 649-63 (2016) (providing an overview of FIFRA). Likewise, California's Proposition 65 requires warning labels for products containing chemicals that may cause cancer or reproductive harm. See Clifford Rechtschaffen, *The Warning Game: Evaluating Warnings Under California's Proposition 65*, 23 ECOLOGY L.Q. 303, 305 (1996) (assessing the practical effects of Proposition 65's warning requirement).

54. Whether existing disclosure programs are effective at changing corporate environmental behavior is another matter. See Case, *supra* note 1, at 393 (“[E]nvironmental disclosure required under various environmental statutes and federal securities laws was not intentionally designed as informational regulation—that is, with widespread public information access and dissemination as primary goals. These reporting requirements are described as ‘fragmentary,’ ‘uncoordinated,’ ‘chaotic,’ and intended primarily to determine minimal compliance with regulatory standards.”).

the gold standard of environmental information regulation.⁵⁵ Research shows that public releases of TRI data lowered stock market prices for the vast majority of TRI-regulated entities. Indeed, according to one careful analysis, TRI-registered firms lost an average of \$4.1 million in stock value on the day of the first TRI disclosure, with the worst polluters hit the hardest.⁵⁶ Subsequent disclosures of TRI data in later years continued to result in aggregate losses for registered firms.⁵⁷ Thus, even as companies reduced their volume of toxic releases in response to the initial disclosure, the overwhelming effect of the TRI has been to penalize, rather than reward, firms for their pollution practices.

Furthermore, the TRI—like the other environmental information schemes described above—provides the greatest incentives to those at the bottom of the environmental performance distribution. Economists Shameek Konar and Mark Cohen, for example, show that the firms whose stock prices declined the most due to the first TRI data disclosure made the biggest environmental gains in subsequent years.⁵⁸ In contrast, environmental leaders—as measured according to the initial TRI data release—made only marginal improvements in their environmental performance.⁵⁹ As a result, the forty worst firms largely caught up to their better performing peers within three years of the initial TRI data disclosure.⁶⁰ The program, in other words, primarily impacted the performance of environmental laggards, not environmental leaders. While effective at driving markets away from the worst performers, it appears to have done little to direct markets toward environmental leaders.⁶¹ Its gains have largely resulted from

55. See, e.g., Case, *supra* note 1, at 381-82 (noting that the “notoriety of the Toxics Release Inventory” sparked policy interest in environmental information regulation); Case, *supra* note 6, at 10,775 (“Although numerous examples of informational regulatory approaches exist in the environmental arena, [the TRI] is perhaps the most widely analyzed example of this approach.”); Cohen, *supra* note 7, at 10425 (noting that the TRI sparked “considerable interest in environmental information disclosure”); Fung & O’Rourke, *supra* note 4, at 115 (musing that the TRI “may be the most successful environmental regulation of the last ten years”); Herb et al., *supra* note 35, at 253; Karkkainen, *supra* note 1, at 280 (calling the TRI a “watershed”); Kleindorfer & Orts, *supra* note 1, at 155 (identifying the TRI as “[o]ne of the best known” examples of environmental information regulation).

56. Hamilton, *supra* note 4, at 112.

57. Khanna et al., *supra* note 6, at 245.

58. Specifically, while the forty most heavily penalized firms subsequently reduced their pollution intensity by an average of 1.84 pounds per thousand dollars of revenue, their peer firms only reduced pollution intensities by 0.17 pounds per thousand. Konar & Cohen, *supra* note 4, at 120.

59. *Id.*

60. *Id.*

61. Civic society’s responses to TRI disclosures further confirm that the regulation worked primarily to call out and penalize bad actors. Several environmental groups, for example, used the data to compile a list of the worst TRI-polluters. Media coverage likewise focused narrowly on the largest polluters. TRI disclosures produced few positive narratives, even for those companies that had improved their environmental performance. Rather, media accounts largely served as warnings to consumers, markets, and society at large of the dangers posed by TRI laggards, thereby reinforcing the incentives to *divest* from environmental laggards without providing noticeable incentives to *invest* in environmental leaders. See Fung & O’Rourke, *supra* note 4, at 121 (finding media coverage of the TRI program “frequently take[s] the form of blacklists that single out one or a small number of facilities as the ‘worst’ environmental performers”); Konar & Cohen, *supra* note 4, at 110, 114.

lifting the bottom of the environmental performance distribution rather than from incentivizing improvements at the top.

These findings should not come as a surprise. They are in line with mainstream academic thinking, which understands environmental information regulation as a regulatory stick used to drive markets away from bad actors. For example, when explaining the mechanisms by which mandatory disclosures can induce environmental performance improvements, seminal scholars in the field invariably tell a story of how data on environmental harms induce consumers, investors, and workers to leave or avoid the worst performers in an industry.⁶² Put simply, they conceptualize environmental information disclosure as establishing a system of red lights that warn markets away from environmental laggards. Rarely, if at all, do they frame environmental information regulation as a mechanism for guiding markets toward environmental leaders.⁶³

Contrary, then, to the established consensus, this Article argues that mandatory disclosure requirements can and should be deployed to guide markets toward environmental leaders. It contends, in particular, that an information system composed solely of red lights will not fully harness investors' growing interest in sustainability. Rather, these investors need—but do not yet have—informational *green lights* that will help them identify and invest in sustainability leadership. Through carefully designed information regulations, policymakers can address these needs—and thereby work to align capital markets with sustainability goals.

II. Investor Interest in Sustainability: Opportunities & Obstacles

The need to expand environmental information regulation beyond the standard red-lights model stems from a recent groundswell of interest in sustainability among mainstream investors. This Part examines this transformation in the investment world—and its implications for environmental

62. See, e.g., Fung & O'Rourke, *supra* note 4, at 120 (explaining how the TRI “induces continual reduction of toxic releases by pressuring whoever happens to fall at the bottom of the list”); Herb et al., *supra* note 35, at 257 (explaining how “the public disclosure of industry environmental performance will motivate industry to take actions to prevent itself from being viewed as a poor environmental performer”); Karkkainen, *supra* note 1, at 295 (explaining how the TRI uses external actors—e.g., markets—to “exert powerful pressures on poor performers to up-grade their [environmental] performance”); Konar & Cohen, *supra* note 4, at 110, 111 (observing that mandatory disclosure only works if “the ‘public’ cares enough about the information being released to ‘punish’ firms that are bad actors” and hypothesizing that, “[i]f the provision of [] information negatively impacts the financial performance of the firm, it will provide a strong incentive to the firm to become a better environmental actor”); Sulkowski & White, *supra* note 7, at 503 (explaining how environmental information regulation harnesses investors and consumers to “bad actors . . . for creating risks and liabilities”).

63. To be sure, academics have developed a voluminous literature on how voluntary labeling schemes—such as organic food labels or the Department of Energy’s Energy Star program—can attract consumers to environmentally beneficial products. See, e.g., Stewart, *supra* note 6, at 136-39. But such initiatives are distinguishable from mandatory disclosure requirements. As discussed below in Section III.A of this Article, voluntary environmental disclosure regimes will not be sufficient to fully harness mainstream investor interest in sustainability.

information regulation. To begin, Section II.A reviews the literature on the relationship between sustainability leadership and financial profits. While far from settled, the extant research suggests that corporate sustainability performance can enhance corporate financial performance in some, but not all, instances. This body of work has helped move sustainability from the fringes of the investment world into the mainstream, as documented in Section II.B.

These new sustainability-minded investors, however, differ from the socially responsible investors of old in at least two important ways. First, they care about their portfolio returns, although they vary greatly in terms of their willingness to sacrifice profits for sustainability considerations. Second, they seek a more nuanced approach toward integrating sustainability into their investment strategies. While socially responsible investors will often categorically exclude entire industries from their portfolios, today's sustainability-minded mainstream investors often seek to bring a *sustainability tilt* to their portfolios by strategically divesting from sustainability laggards and investing in sustainability leaders. Section II.C then explains how the current patchwork of mandatory and voluntary disclosure regimes fails to satisfy the information needs of mainstream investors. While the current system provides a series of sustainability red lights that crudely correlate with business fundamentals, mainstream investors are looking for a set of sustainability red and green lights that materially relate to corporate financial performance. This information deficit, in turn, has slowed the translation of sustainability *interest* into sustainable *investing*.

A. Does Sustainability Leadership Pay Off?

Traditionally, academics and the business community have viewed the financial value of sustainability with skepticism.⁶⁴ Adopting a neoclassical theory of markets and firm behavior, these critics have argued that corporate sustainability initiatives—such as reducing pollution beyond legally mandated levels—increase operation costs, reduce profits, and therefore place firms at a competitive disadvantage.⁶⁵ Thus, according to this theory, pursuing *any*

64. Jan Endrikat, *Market Reactions to Corporate Environmental Performance Related Events: A Meta-Analytic Consolidation of the Empirical Evidence*, 138 J. BUS. ETHICS 535, 537 (2016) (“[T]he early literature rooted in neoclassical economics argued that environmental activities would withdraw financial resources from a firm and thus weaken its financial performance because the financial benefits of activities are deemed to be lower than their costs.”); Andrew King & Michael Lenox, *Exploring the Locus of Profitable Pollution Reduction*, 48 MGMT. SCI. 289, 289 (2002) (“Historically, scholars have argued that discretionary reductions in pollution by firms should lead to lower financial performance.”).

65. See, e.g., Milton Friedman, *The Social Responsibility of Business Is to Increase Its Profits*, N.Y. TIMES MAG. (Sept. 13, 1970), <https://graphics8.nytimes.com/packages/pdf/business/miltonfriedman1970.pdf> [https://perma.cc/7LJ7-377F].

considerations outside of a narrow, profit-maximization framework will invariably hurt the company's bottom line.⁶⁶

In recent years, however, a growing body of research has pushed back against the idea that investments in sustainability invariably come at the cost of corporate financial performance.⁶⁷ Instead, it has identified “win-win”⁶⁸ or “green-to-gold”⁶⁹ opportunities wherein sustainability leadership pays off in financial terms. Leading on sustainability can, for example, drive top- and bottom-line growth by improving organizational reputation and brand name.⁷⁰ Through these and other mediators, investments in sustainability can attract higher-quality employees,⁷¹ increase customer loyalty,⁷² reduce transaction costs with suppliers,⁷³ and appeal to green consumers who are willing to pay eco-premiums for their goods and services.⁷⁴ In addition to strengthening the firm's

66. Michael E. Porter & Mark R. Kramer, *Creating Shared Value*, HARV. BUS. REV. (Jan.-Feb. 2011), <https://hbr.org/2011/01/the-big-idea-creating-shared-value> [<https://perma.cc/6B2W-RWFM>] (“In neoclassical thinking, a requirement for social improvement . . . imposes a constraint on the corporation. Adding a constraint to a firm that is already maximizing profits, says the theory, will inevitably raise costs and reduce those profits.”).

67. For a detailed, narrative review of this literature, see generally Stefan Ambec & Paul Lanoie, *Does It Pay to Be Green? A Systematic Overview*, 22 ACAD. MGMT. PERSP. 45 (2008).

68. The potential existence of “win-win” situations has come to be known as the Porter Hypothesis. See Paul Lanoie et al., *Environmental Policy, Innovation and Performance: New Insights on the Porter Hypothesis*, 20 J. ECON. & MGMT. STRATEGY 803, 804 (2011). For the first articulations of this theory, see generally Porter & van der Linde, *supra* note 16; and Michael E. Porter & Claas van der Linde, *Green and Competitive: Ending the Stalemate*, HARV. BUS. REV. (Sept.-Oct. 1995), <https://hbr.org/1995/09/green-and-competitive-ending-the-stalemate> [<https://perma.cc/ZJN6-QKJY>].

69. ESTY & WINSTON, *supra* note 16.

70. Stephen Brammer & Stephen Pavelin, *Building a Good Reputation*, 22 EUR. MGMT. J. 704, 704 (2004) (discussing the link between CSR and company reputation); Heather R. Dixon-Fowler et al., *Beyond “Does It Pay to be Green?” A Meta-Analysis of Moderators of the CEP-CFP Relationship*, 112 J. BUS. ETHICS 353, 354 (2013) (describing how “firms with strong environmental performance might reap reputational benefits”); Tiago Melo & Jose Ignacio Galan, *Effects of Corporate Social Responsibility on Brand Value*, 18 J. BRAND MGMT. 423, 423 (2011) (finding that corporate social responsibility has a positive impact on brand value); Orlitzky, *supra* note 4, at 5 (“From theoretical and practical perspectives, organizational reputation ranks as one of the most important mediating variables linking [corporate sustainability] to [corporate financial performance].”).

71. See, e.g., Backhaus, *supra* note 30, at 293 (reviewing literature showing that “organization image influences the firm’s ability to attract applicants”); Daniel W. Greening & Daniel B. Turban, *Corporate Social Performance as a Competitive Advantage in Attracting a Quality Workforce*, 39 BUS. & SOC’Y 254, 254 (2000) (explaining how signaling theory and social-identity theory predict that corporate social-performance activities will attract higher-quality job applicants).

72. See, e.g., Ambec & Lanoie, *supra* note 67, at 47; Eccles et al., *supra* note 28, at 2850 (reviewing literature showing that sustainability practices affect a variety of consumer outcomes).

73. See, e.g., Porter & Kramer, *supra* note 66, at 10.

74. See, e.g., ESTY & WINSTON, *supra* note 16, at 135-42 (discussing various ways well designed corporate environmental strategies can deliver “eco-advantage” in the marketplace); Elisabeth Albertini, *Does Environmental Management Improve Financial Performance? A Meta-Analytical Review*, 26 ORG. & ENV’T 431, 434 (2013) (“Differentiation advantage creates the potential to increase product selling prices that results in higher revenues.”); Sheila Bonini & Jeremy Oppenheim, *Cultivating the Green Consumer*, STAN. SOC. INNOVATION REV. 56 (2008) (documenting growing corporate interest in attracting green consumers); Innes & Sam, *supra* note 28, at 271; Stephanie M. Tully & Russell S. Winer, *The Role of the Beneficiary in Willingness to Pay for Socially Responsible Products: A Meta-Analysis*, 90 J. RETAILING (2014) (providing meta-analysis showing that consumers are willing to pay significantly more for socially responsible products); Mehdi Miremadi et al., *How Much Will Consumers*

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position vis-à-vis external stakeholders, the development of strong sustainability practices can improve the internal efficiency of the company by streamlining firm operations, eliminating waste, improving resource use,⁷⁵ enhancing key managerial competencies, and catalyzing corporate innovations.⁷⁶

Importantly, this literature has identified sustainability leaders as a class unto themselves.⁷⁷ Sustainability leaders do not simply implement more sustainability initiatives than their peers. They take a fundamentally different approach toward sustainability. While some companies view environmental concerns, such as pollution control, as a fringe issue, sustainability leaders integrate sustainability considerations into their core business model.⁷⁸ That is, they treat sustainability not only as a risk to be mitigated at the margins, but as a key arena for delivering productivity gains and future revenue growth.⁷⁹ Rather than adopting sustainability practices in response to existing regulatory constraints and pressures, they proactively invest in sustainability as a business strategy to enhance short- and long-term growth.⁸⁰ In doing so, they recognize

Pay to Go Green?, MCKINSEY Q. (Oct. 2012), <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/how-much-will-consumers-pay-to-go-green> [<https://perma.cc/HZE7-CREQ>] (presenting survey evidence showing consumers' willingness to pay more for sustainable products).

75. See Porter & van der Linde, *supra* note 68 (arguing that “pollution often is a form of economic waste”).

76. Albertini, *supra* note 74, at 434 (“Through this framing, environmental practices are considered to result in strategic improvements by reassessing taken-for-granted engineering practices, rules of thumb, and protocols.”).

77. THE CONF. BOARD, THE SEVEN PILLARS OF SUSTAINABILITY LEADERSHIP ¶ 1 (2016) (identifying “seven pillars of sustainability leadership” that distinguish top sustainability companies from the pack, including embedding sustainability into the company’s innovation process and tying executive compensation to sustainability performance); Robert G. Eccles et al., *How to Become a Sustainable Company*, 55 MIT SLOAN MGMT. REV. 43, 44 (2012) (arguing that sustainability leadership may require a complete reframing of the company’s identity); Sheila Bonini & Anne-Titia Bové, *Sustainability’s Strategic Worth*, MCKINSEY & CO. fig.5 (July 2014), <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/sustainability-strategic-worth-mckinsey-global-survey-results> [<https://perma.cc/2595-BS2Z>] (distinguishing sustainability leaders on a variety of organizational characteristics, including whether a company has aggressive external sustainability targets, a unified sustainability strategy, and leadership buy-in).

78. See Lubin & Esty, *supra* note 16, at 4 (explaining how market leaders in the past “drove revenue growth by integrating innovative approaches into their core strategies”); Sheila Bonini & Stephan Görner, *The Business of Sustainability*, MCKINSEY & CO. (Oct. 2011), <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/the-business-of-sustainability-mckinsey-global-survey-results> [<https://perma.cc/9KU7-V2CP>] (finding that a handful of leading companies are capturing significant value by systematically integrating sustainability into their business operations).

79. ESTY & WINSTON, *supra* note 16, at 11; David A. Lubin & Daniel C. Esty, *Bridging the Sustainability Gap*, MIT SLOAN MGMT. REV. 19-20 (2014) (outlining a sustainability-based “value driver model” focused on growth and productivity as well as risk); Porter & Kramer, *supra* note 66, at 10 (describing how product and supply-chain redesign around sustainability principles can unlock new growth opportunities for companies); Bonini & Görner, *supra* note 78, at 13 (“[M]ost companies do not actively seek opportunities to invest in any area of sustainability and therefore miss potential growth opportunities.”).

80. See Endrikat, *supra* note 64, at 738 (discussing the advantages of proactive sustainability strategies over reactive ones).

sustainability as “an emerging megatrend”—an economic and societal transformation that will fundamentally alter how companies compete.⁸¹ While most executives understand that sustainability pressures—including, most notably, climate change and resource scarcity—will profoundly reshape markets in the twenty-first century,⁸² sustainability leaders are taking strategic actions now. They see both the existential risks from responding too late to the “sustainability imperative” and the profitable upsides from getting ahead of this impending societal shift.⁸³ As Professors Esty and Lubin explain, sustainability leaders are “placing strategic bets on innovation in energy efficiency, renewable power, resource productivity, and pollution control” in order to enhance “their companies’ long-term competitiveness.”⁸⁴ Other scholars have similarly pointed out that the real opportunities for sustainability-driven growth come when companies integrate sustainability into their core business functions (i.e., become sustainability leaders), rather than when companies merely address sustainability at the margins.⁸⁵

81. Lubin & Esty, *supra* note 16, at 1 (identifying electrification, the rise of mass production, globalization, and the quality movement of the 1970s and 1980s as other business “megatrends”).

82. See Gina Iacona, *Going Green to Make Green: Necessary Changes to Promote and Implement Corporate Social Responsibility While Increasing the Bottom Line*, 26 J. LAND USE & ENVTL. L. 113, 121 (2010) (reviewing survey evidence showing recognition among corporate executives that sustainability was important to corporate growth); Bonini & Görner, *supra* note 78, at 5 tbl.3 (2011) (showing that more than three quarters of CEOs surveyed identified sustainability as a priority in their global agenda); *id.* at 3 fig.2 (survey results showing that twice as many global CEOs reported in 2014 that sustainability was their top priority than 2012); Global Compact, *CEO Study on Sustainability 2013: Architects of a Better World*, UNITED NATIONS 11 (Sept. 2013), https://www.unglobalcompact.org/docs/news_events/8.1/UNGC_Accenture_CEO_Study_2013.pdf [<https://perma.cc/GT8K-TBYN>] (finding that in a 2013 survey of one thousand CEOs from across the world, ninety-three percent reported sustainability as “key to success”).

83. See generally Lubin & Esty, *supra* note 16.

84. *Id.* at 3.

85. See, e.g., 2 MARC J. EPSTEIN & ADRIANA REJC BUHOVAC, MAKING SUSTAINABILITY WORK: BEST PRACTICES IN MANAGING AND MEASURING CORPORATE SOCIAL, ENVIRONMENTAL, AND ECONOMIC IMPACTS 3 (2014) (“For sustainability to be valuable to both the organization and its stakeholders, it must be integrated into the way a company does business.”); LUCY NOTTINGHAM, MARSH & MCLENNAN COMPANIES, UNLOCKING GROWTH BY INTEGRATING SUSTAINABILITY: HOW TO OVERCOME THE BARRIERS 3 (2016) (“It is clear that corporate sustainability approaches must move from ‘nice to have’ efforts to promote the company and create employee engagement to a means to drive growth, manage risks to corporate earnings, and engage with financial markets.”); Jan Endrikat et al., *Making Sense of Conflicting Empirical Findings: A Meta-Analytic Review of the Relationship Between Corporate Environmental and Financial Performance*, 32 EUR. MGMT. J. 735, 735 (2014) (finding that proactive corporate environmental initiatives have a more positive impact on financial performance than reactive ones); Michael V. Russo & Paul A. Fouts, *A Resource-Based Perspective on Corporate Environmental Performance and Profitability*, 40 ACAD. MGMT. J. 534, 537-38 (1997) (explaining why proactive environmental initiatives, which go beyond regulatory standards and involve process redesign, should generate more value than reactive ones, which simply comply with “end-of-pipe compliance policies”). *But see* Dixon-Fowler, *supra* note 70, at 362 (finding that both proactive and reactive environmental initiatives positively impact corporate financial performance to equal degrees, and speculating that there is enough “‘low-hanging’ fruit available for [reactive] solutions to be still profitable, although this could change over time as they run out”).

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For example, Unilever, the consumer products giant, has distinguished itself as a corporate sustainability leader through its Sustainable Living Plan.⁸⁶ Launched in 2010, this ambitious corporate action plan promised to revamp the company's business model around a series of aggressive sustainability targets.⁸⁷ By 2020, Unilever pledged to double its revenues while halving the environmental footprint of its products, sourcing all of its agricultural raw materials sustainably and integrating half a million small-scale farmers and distributors into its supply chains.⁸⁸ Toward those ends, the company has aggressively and holistically integrated sustainability practices into its governance structures, product lines, management practices, and supply chains.⁸⁹ For example, Unilever has linked executive pay to sustainability targets, developed a central team dedicated to spreading best sustainability practices across the company's diverse operations, worked to improve the eco-efficiency of its supply chains through collaborations with its suppliers, sought advice from an external sustainable development advisory board,⁹⁰ and placed environmental and social responsibility at the core of its brand communications and strategies.⁹¹ Moreover, Unilever CEO Paul Polman made it clear that he views sustainability as a revenue-growth strategy.⁹² Accordingly, the company has focused its efforts on identifying and exploiting the profit upsides to sustainability.

From an environmental perspective, these efforts have delivered measurable gains. Since 2008, the company has cut carbon emissions and water consumption at its factories by 47% and 39%, respectively.⁹³ And in 2017, Unilever reported that it had reduced the waste associated with the disposal of

86. In surveys of sustainability experts, Unilever has consistently dominated corporate sustainability leadership rankings. See, e.g., *The 2015 Sustainability Leaders*, GLOBALSCAN & SUSTAINABILITY 4 (2015), <https://globescan.com/wp-content/uploads/2017/07/GlobeScan-Sustainability-Survey-Sustainability-Leaders-2015.pdf> [<https://perma.cc/LLC2-PZ79>].

87. *Our Sustainable Living Report Hub*, UNILEVER, <https://www.unilever.com/sustainable-living/our-sustainable-living-report-hub> [<https://perma.cc/HT23-ZV5E>].

88. Unilever, *Unilever Sustainable Living Plan*, THE GUARDIAN (Oct. 5, 2011, 11:00 PM EDT), <https://www.theguardian.com/sustainable-business/unilever-sustainable-living-plan> [<https://perma.cc/MC9B-DUQW>].

89. See BusinessGreen Staff, *Unilever's Sustainability Program Saves \$395M Since 2008*, GREENBIZ (Apr. 18, 2013, 4:00 AM), <https://www.greenbiz.com/news/2013/04/18/unilever-sustainability-program-saves-395m> [<https://perma.cc/LA6H-6YAH>] (documenting some of Unilever's sustainability initiatives); Michael Holder, *Unilever Reports Strong Growth for 'Sustainable Living' Brands*, GREENBIZ (May 19, 2016, 12:20 AM), <https://www.greenbiz.com/article/unilever-reports-strong-growth-sustainable-living-brands> [<https://perma.cc/AQ6X-PLCR>] (same).

90. Professor Esty served on this advisory board from 1996 to 2011.

91. *Unilever: In Search of the Good Business*, THE ECONOMIST (Aug. 9, 2014), <https://www.economist.com/business/2014/08/09/in-search-of-the-good-business> [<https://perma.cc/M5QN-F3NM>].

92. Vivienne Walt, *Unilever CEO Paul Polman's Plan to Save the World*, FORTUNE (Feb. 17, 2017), <http://fortune.com/2017/02/17/unilever-paul-polman-responsibility-growth> [<https://perma.cc/7YZ6-HL9K>].

93. *Sustainable Living Plan: 3 Year Summary of Progress*, UNILEVER (May 2018), https://www.unilever.com/Images/uslp-targets-3-year-summary-of-progress_tcm244-526543_en.pdf [<https://perma.cc/AG57-C63W>].

its products by 29%, cut the weight of its products' packaging by 13%, and obtained 56% of its agricultural materials from sustainable sources.⁹⁴ Thanks to these and other eco-efficiency measures, Unilever has avoided over seven hundred million euros in costs since 2008 by cutting its waste; reducing its use of energy, raw materials, and natural resources; and limiting its exposure to resource-price volatility.⁹⁵ While a causal link would be hard to prove, Unilever's sustainability initiatives also appear to have helped the company improve its market position. Unilever reported that, in 2017, its "sustainable living" brands—which represent Unilever's most sustainable product lines—grew 46% faster than the rest of its business and accounted for 70% of the company's turnover growth.⁹⁶ The company's stock value has also grown by more than 15% since 2009, even as other consumer-product giants, such as Proctor & Gamble, Campbell Soup, and Kellogg, have struggled in recent years.⁹⁷ Given how central sustainability is to Unilever's business model and brand image, the company's outperformance of its peers is suggestive, although by no means dispositive, of the profit potential of sustainability leadership.

While Unilever is exceptional in its alignment of core business functions with sustainability principles, its success at turning sustainability into revenue growth probably is not a fluke. Rather, it appears to be illustrative of the profit potential of becoming a sustainability leader.⁹⁸ In particular, empirical work on

94. *Id.*

95. *Unilever's Sustainable Living Brands Continue to Drive Higher Rates of Growth*, UNILEVER (May 18, 2017), <https://www.unilever.com/news/press-releases/2017/unilevers-sustainable-living-brands-continue-to-drive-higher-rates-of-growth.html> [https://perma.cc/B6FA-UWJ2]; *Commitment to Sustainability Delivers Even Faster Growth for Unilever*, UNILEVER (May 16, 2016), <https://www.unilever.com/news/press-releases/2016/Commitment-to-sustainability-delivers-even-faster-growth-for-unilever.html> [https://perma.cc/26ND-A6VU]. For example, Unilever's waste disposal program has achieved approximately 262 million euros in cost avoidance, primarily by reducing Unilever's production of waste (which eliminates the costs of managing and disposing of the company's waste), recycling and repurposing waste for additional internal use (which lowers input and resource costs), and selling waste streams to third parties to generate additional income (e.g., selling used paper, plastics, metal, and glass to other industries). See *Going Beyond Zero Waste to Landfill*, UNILEVER, <https://www.unilever.com/sustainable-living/reducing-environmental-impact/waste-and-packaging/going-beyond-zero-waste-to-landfill> [https://perma.cc/7FC7-MWM2]; Jessica Lyons Hardcastle, *Unilever Chief Supply Chain Officer on How to Achieve Zero Waste*, ENVIRONMENTAL LEADER (Feb. 15, 2016), <https://www.environmentalleader.com/2016/02/unilever-chief-supply-chain-office-on-how-to-achieve-zero-waste> [https://perma.cc/BKZ9-PQPZ]. Meanwhile, Unilever's energy efficiency program has yielded an estimated 493 million euros in cost savings by cutting the company's energy consumption by twenty-six percent. See *Our Eco-Efficiency Performance*, UNILEVER, <https://www.unilever.com/sustainable-living/reducing-environmental-impact/eco-efficiency-in-manufacturing/our-eco-efficiency-performance> [https://perma.cc/R7J9-E8PT].

96. *Unilever's Sustainable Living Brands Delivered 70% of Turnover Growth in 2017*, SUSTAINABLE BRANDS (May 10, 2018), https://www.sustainablebrands.com/news_and_views/business_case/sustainable_brands/unilevers_sustainable_living_brands_delivered_70_tur [https://perma.cc/DH3C-PEAQ].

97. Bill George, *As Consumer Giants Struggle, Unilever Rises Above the Pack*, CNBC (May 25, 2018), <https://www.cnbc.com/2018/05/25/bill-george-as-consumer-giants-struggle-unilever-rises-above-the-pack.html> [https://perma.cc/ETK9-4SXD].

98. To be clear, while Unilever stands out as a leader on corporate sustainability, it is not alone. Other companies have similarly attempted to reorient their business models around sustainability practices and principles. See, e.g., ESTY & WINSTON, *supra* note 16, at 122-44 (providing

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corporate sustainability has increasingly lent support to the idea that, under the right circumstances, there may be a systematic relationship between sustainability leadership and a company's bottom line.⁹⁹ Meta-analyses¹⁰⁰ of the literature, for example, have consistently identified positive relationships between corporate sustainability practices and corporate financial performance.¹⁰¹ Indeed, the five most recently published meta-analyses found strong evidence that at least some sustainability initiatives pay off.¹⁰² This conclusion has been echoed by a number of prominent narrative reviews of the empirical research. For instance, based on a survey of 190 academic studies, researchers at Oxford University and Arabesque Partners concluded that sustainability practices can enhance operational performance, lower the cost of capital, and improve stock price performance.¹⁰³

numerous examples of companies that have used sustainability practices to drive growth). For example, in 2005, General Electric launched its Ecomagination initiative, in which it pledged to generate \$20 billion in annual revenue from sustainable products by 2010. *See id.* at 122. By 2009, annual revenue from Ecomagination products had reached \$25 billion. *See* Joel Makower, *Ecomagination at 10: A Status Report*, GREENBIZ (May 11, 2015, 1:11 AM), <https://www.greenbiz.com/article/ecomagination-10-status-report> [<https://perma.cc/8EPU-X4WZ>]. During this time, Ecomagination sales also grew twice as fast as total company sales. *See* Andrew Winston, *GE Is Avoiding Hard Choices About Ecomagination*, HARV. BUS. REV. (Aug. 1, 2014), <https://hbr.org/2014/08/ges-failure-of-ecomagination> [<https://perma.cc/W67B-NJ93>]. After having invested \$17 billion into Ecomagination research and development, General Electric had reaped more than \$232 billion from the initiative by 2015. *See* Jasper Scherer, *How GE Is Changing the World*, FORTUNE (August 19, 2016), <http://fortune.com/2016/08/19/general-electric-change-world> [<https://perma.cc/U9H5-TQZY>]. While the Ecomagination program has come under fire in recent years for investing in technologies to reduce greenhouse gases from Canadian oil sands production, the first ten years of the initiative have been widely touted as a success at harnessing sustainability to generate profits. *See* Winston, *supra* note 98.

99. *See, e.g.*, Eccles et al., *supra* note 28, at 2835 (finding that “high sustainability” companies that “voluntarily adopted sustainability policies by 1993 . . . outperform[ed] their counterparts over the long term, both in terms of stock market and accounting performance”).

100. Meta-analyses employ econometric methods to aggregate and synthesize findings across individual studies.

101. *See, e.g.*, Friede et al., *supra* note 16, at 210 (stating that of the more than two thousand empirical articles published on the market value of sustainability since the 1970s, roughly ninety percent found nonnegative relationships between ESG factors and corporate financial performance, with the vast majority reporting positive associations); Susan L. Golicic & Carlo D. Smith, *A Meta-Analysis of Environmentally Sustainable Supply Chain Management Practices and Firm Performance*, 49 J. SUPPLY CHAIN MGMT. 78, 78 (2013) (finding that “the link between environmental supply chain practices and market-based, operational-based and accounting-based forms of financial performance is positive and significant”); Marc Orlitzky, *Does Firm Size Confound the Relationship Between Corporate Social Performance and Firm Financial Performance?*, 33 J. BUS. ETHICS 167, 167 (2001) (“[E]ven if firm size is controlled for across studies (comprising, on average, over fifteen thousand observations), [sustainability] and [corporate financial performance] remain positively correlated.”); Marc Orlitzky & John D. Benjamin, *Corporate Social Performance and Firm Risk: A Meta-Analytic Review*, 40 BUS. & SOC’Y 369, 391 (2001) (finding “the better a firm’s [sustainability] reputation, the lower its [market] risk”); Marc Orlitzky et al., *Corporate Social and Financial Performance: A Meta-Analysis*, 24 ORGANIZATIONAL STUD. 403, 403 (“The meta-analytic findings suggest that corporate virtue . . . is likely to pay off.”).

102. Albertini, *supra* note 74, at 431; Dixon-Fowler, *supra* note 70, at 353; Endrikat, *supra* note 64, at 535; Endrikat, *supra* note 85, at 735; Friede et al., *supra* note 16, at 210.

103. Clark et al., *supra* note 12, at 9; *see also* Ambec & Lanoie, *supra* note 67, at 57 (providing a comprehensive, narrative review of the literature that points to a number of “win-win” investments in sustainability).

This view, however, has not been universally adopted. Well-respected researchers continue to question the materiality of sustainability to profits, arguing that the scope of “win-win” opportunities is narrower than most believe.¹⁰⁴ Backing these conclusions is a steady stream of case studies and empirical analyses that find negative associations between financial performance and corporate environmental management.¹⁰⁵ Indeed, researchers have identified instances where corporate *irresponsibility* pays more than corporate *responsibility*.¹⁰⁶ Some have pointed to these mixed findings as evidence against the existence of green-to-gold opportunities, concluding that the empirical case for eco-efficiencies and other sustainability upsides is weak or nonexistent.¹⁰⁷ Others have interpreted these inconsistencies as evidence of pervasive regulatory failures that too often allow companies to externalize costs onto society and the environment.¹⁰⁸

A growing number of scholars, however, have turned to two alternative explanations of these mixed results. First, inconsistent findings may signal that some, but not all, ESG factors impact financial performance.¹⁰⁹ Sustainability leadership can take a myriad of forms, and few scholars expect that it always pays to be green. Indeed, it seems highly unlikely that sustainability practices would uniformly impact revenue growth, given the breadth of possible sustainability practices that can be pursued (e.g., compliance with minimal pollution standards versus proactive investments in clean energy technologies) and the many different channels by which sustainability can theoretically impact earnings (e.g., enhanced operational efficiency versus improved reputation). In

104. See, e.g., PETER FLEMING & MARC T. JONES, *THE END OF CORPORATE SOCIAL RESPONSIBILITY: CRISIS & CRITIQUE* 4 (2013); ALFRED A. MARCUS, *INNOVATIONS IN SUSTAINABILITY: FUEL AND FOOD* 2 (2015) (arguing that existing green-to-gold opportunities are “narrow and limited”); Andrew Crane et al., *Contesting the Value of “Creating Shared Value”*, 56 CAL. MGMT. REV. 130, 136 (2014) (“Many corporate decisions related to social and environmental problems, however creative the decision-maker may be, do not present themselves as potential win-wins, but rather will manifest themselves in terms of dilemmas.”); Peter Dauvergne & Jane Lister, *The Prospects and Limits of Eco-Consumerism: Shopping Our Way to Less Deforestation?*, 23 ORG. & ENV’T 132, 146 (2010) (expressing skepticism of corporate sustainability’s potential to produce global change); David Vogel, *Opportunities for and Limitations of Corporate Environmentalism*, in ENVIRONMENTAL PROTECTION AND THE SOCIAL RESPONSIBILITY OF FIRMS: PERSPECTIVES FROM LAW, ECONOMICS, AND BUSINESS 197-202 (Bruce L. Hay ed., 2005).

105. See, e.g., James J. Cordeiro & Joseph Sarkis, *Environmental Proactivism and Firm Performance: Evidence from Security Analyst Earnings Forecasts*, 6 BUS. STRATEGY & ENV’T 104, 104 (1997); Karen Fisher-Vanden & Karin S. Thorburn, *Voluntary Corporate Environmental Initiatives and Shareholder Wealth*, 62 J. ENVTL. ECON. & MGMT. 430, 430 (2011); Lars Hassel et al., *The Value Relevance of Environmental Performance*, 14 EUR. ACCT. REV. 41, 41 (2005).

106. See, e.g., Kwang-Ho Kim et al., *Effects of Corporate Social Responsibility on Corporate Financial Performance: A Competitive-Action Perspective*, 44 J. MGMT. 1097, 1097 (2018) (finding evidence that socially irresponsible activities improve firm financial performance in certain circumstances); Matthew J. Kotchen & Jon Jungbien Moon, *Corporate Social Responsibility for Irresponsibility* 1 (Nat’l Bureau of Econ. Research, Working Paper No. 17254, 2011).

107. See *supra* note 104.

108. Esty & Cort, *supra* note 14, at 20.

109. See Albertini, *supra* note 74, at 432; Endrikat, *supra* note 85, at 746; Esty & Cort, *supra* note 14, at 21; Orlitzky, *supra* note 4, at 13.

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support of this explanation, several meta-analytic studies have identified contextual and programmatic factors that mediate the positive effect of corporate environmental performance on corporate financial performance.¹¹⁰

Researchers also point to a variety of *methodological* inconsistencies as a second explanation for the literature's mixed findings.¹¹¹ Studies vary widely in terms of how they operationalize sustainability, and some variables have a stronger theoretical connection to the concept of sustainability than others. The rigor of the analyses also fluctuates greatly, with some researchers doing a better job than others at accounting for confounding factors and isolating causal relationships between environmental and financial performance.¹¹² To this point, a recent meta-analysis found that studies that employed less sophisticated models underestimated the financial benefits of sustainability leadership due to omitted variable bias.¹¹³

Increasingly, scholars have viewed these persisting empirical inconsistencies as a call to refine their conceptual and methodological tools, rather than to revisit the threshold question of whether sustainability can improve financial performance.¹¹⁴ Or, as one reviewer of the literature put it: "we must move beyond simply asking 'Does it pay to be green?' to 'When does it pay to be green?'"¹¹⁵ As discussed below in Section II.B, many investors are asking similar questions. They are intrigued by the potential of sustainability upsides,

110. See, e.g., Albertini, *supra* note 74, at 440-41 (estimating that the relationship between environmental performance and financial performance was strongest when the researchers measured environmental performance using environmental *management* variables, as opposed to environmental *output* or environmental *disclosure* variables); Orlitzky, *supra* note 4, at 13 ("The large variability of the [sustainability]-[corporate financial performance] relationships suggests several moderators (e.g. measurement strategies, industry growth, etc.) which should be examined in future research.").

111. Esty & Cort, *supra* note 14, at 20-21.

112. See Timo Busch & Volker H. Hoffmann, *How Hot Is Your Bottom Line? Linking Carbon and Financial Performance*, 50 BUS. & SOC'Y 233, 234-35 (2011) (linking inconsistencies in findings to inconsistencies in defining and measuring the constructions of "sustainability" and "corporate financial performance"); Abigail McWilliams et al., *Corporate Social Responsibility: Strategic Implications*, 43 J. MGMT. STUD. 1, 12 (2006) (positing that inconsistencies in the relationships between corporate social responsibility (CSR) and firm financial performance "may be a result of inconsistency in defining CSR, inconsistency in defining firm performance, inconsistency in samples, imprecision and inconsistency in research design, misspecification of models, changes over time, or some more fundamental variance in the samples that are being analyzed"); Orlitzky, *supra* note 4, at 13 (finding that "[t]he large variability of findings in studies is partly due to primary-study artifacts"—that is, differences in data and model specification); Kjetil Telle, "It Pays to Be Green"—A Premature Conclusion, 35 ENVTL. & RESOURCE ECON. 195, 197 (2006) (discussing the methodological shortcomings of many empirical studies of the effects of sustainability on financial performance, including failure to adequately address omitted variable bias).

113. Eva Horvathova, *Does Environmental Performance Affect Financial Performance? A Meta-Analysis*, 70 ECOLOGICAL ECON. 52, 56 (2010). On the other hand, studies that employed *qualitative* measures of environmental performance were more likely than *quantitative* ones to produce positive associations between sustainability and financial value. *Id.*

114. See, e.g., Orlitzky, *supra* note 4, at 13-14.

115. Dixon-Fowler, *supra* note 70, at 354; see also Busch & Hoffmann, *supra* note 112, at 234 (echoing this call); Renato J. Orsato, *Competitive Environmental Strategies: When Does It Pay to be Green?*, 48 CAL. MGMT. REV. 127, 127 (2006) (same).

but they want more clarity on *how* sustainability impacts companies' bottom lines and *when* sustainability leadership pays financial dividends.

B. Growing Interest in Sustainable Investing

Sustainable investing is by no means a new phenomenon.¹¹⁶ For decades, a small segment of investors have expressed their moral values by excluding socially or environmentally “bad” industries from their portfolios.¹¹⁷ Many religious groups, for example, have consistently refrained from investing in alcohol, gambling, or other so-called “sin” industries.¹¹⁸ More recently, secular organizations have begun using divestment as a means of advocating on behalf of the environment, civil rights, and other social issues.¹¹⁹

What is new, however, is sustainability's move into the mainstream of the investment world.¹²⁰ Until recently, sustainability has been considered a fringe issue, appropriate only for those investors who did not care about the financial returns on their portfolios.¹²¹ But the past decade has witnessed an explosion of interest in sustainable investing practices among mainstream investors who prioritize strong financial returns.¹²² For example, the United Nations Principles

116. In one of the first recorded instances of socially responsible investing, Quaker communities divested from slavery-related industries in the seventeenth century. See EUROSIF, EUROPEAN SRI STUDY 8 (2012).

117. See Stewart et al., *supra* note 14, at 2.

118. ALEXANDER BOERSCH, ALLIANZ GLOBAL INV., DOING GOOD BY INVESTING WELL? PENSION FUNDS AND SOCIALLY RESPONSIBLE INVESTMENT: RESULTS OF AN EXPERT SURVEY 5 (2010).

119. BOERSCH, *supra* note 118, at 5 (documenting the use of socially responsible investing by the Civil Rights Movement, the environmental movement, and the Anti-Apartheid Movement).

120. Clark et al., *supra* note 12, at 10 (identifying sustainability as “one of the most significant trends in financial markets for decades”); Shaheen Contractor & Gregory Elders, *Asset Growth Speeds ESG Shake Up*, BLOOMBERG (Oct. 11, 2017), <https://www.bloomberg.com/professional/blog/asset-growth-speeds-esg-shake> (“Environmental, social and governance funds are moving beyond their niche market, driven by new funds and an asset growth pace that’s picked up in the last few years.”); Alex Davidson, “Sustainable Investing” Goes Mainstream, WALL ST. J. (Jan. 13, 2016), <https://www.wsj.com/articles/sustainable-investing-goes-mainstream-1452482737> [<https://perma.cc/9YCU-L6E2>] (noting how mainstream financial firms—such as BlackRock and Goldman Sachs—have launched a variety of ESG investment products); Gregory Elders & Morgan Tarrant, *Sustainable Investing Grows on Asset Owner Demand*, BLOOMBERG (Apr. 17, 2017), <https://www.bloomberg.com/professional/blog/sustainable-investing-grows-asset-owner-demand> (providing detailed data analysis showing that “[s]ustainable investing is moving to broader investment analysis from the confines of specialty funds”); Elizabeth Lewis & Ariel Pinchot, *Overcoming These 3 Challenges Can Drive Sustainable Investing into the Mainstream*, WORLD RESOURCES INST. (Jan. 4, 2017), <http://www.wri.org/blog/2017/01/overcoming-these-3-challenges-can-drive-sustainable-investing-mainstream> [<https://perma.cc/8H49-GKDZ>] (“Sustainable investing is ballooning.”).

121. See Esty & Cort, *supra* note 14, at 13.

122. See EUROSIF, *supra* note 116, at 7 (reporting evidence “demonstrating the continuous appetite by investors to take into account Environmental, Social and Governance factors”); Busch et al., *supra* note 12, at 304; Elyse Douglas et al., *Responsible Investing: A Guide to ESG Data Providers and Relevant Trends*, 8 J. ENVTL. INVESTING 11, 94 (2017); Jody Grewal et al., *Market Reaction to Mandatory Nonfinancial Disclosure 6* (Harvard Bus. Sch., Working Paper No. 16-025, 2015); Sara Bernow et al., *From “Why” to “Why Not”: Sustainable Investing as the New Normal*, MCKINSEY & CO.

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for Responsible Investment—an initiative launched in 2006 to help investors integrate sustainability considerations into their portfolios—has signed on more than 1,400 investment organizations who collectively manage about \$60 trillion.¹²³ In another metric of sustainability’s growing popularity, the Global Sustainable Investment Alliance (GSIA) reports that nearly \$23 trillion of assets worldwide are professionally managed under a variety of “responsible investment strategies”—up by more than 70% from 2012 levels.¹²⁴ The United States Sustainable Investment Forum (USSIF) reports a similar shift taking place in the United States: since 1995, for example, American sustainable investments have jumped fourteen-fold, totaling to nearly \$9 trillion in 2016.¹²⁵

Notably, this investor interest in sustainability shows no signs of abating.¹²⁶ Surveys of asset owners and managers consistently find that demand for sustainability data is growing.¹²⁷ Financial experts likewise predict that sustainable investment numbers will continue to rise in the future.¹²⁸ Meanwhile, high-profile thought leaders continue to add momentum to the sustainable investing movement. For example, the CEO of Blackrock—the world’s largest asset manager—released a public letter in 2016 calling on chief executives at

(Oct. 2017), <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/from-why-to-why-not-sustainable-investing-as-the-new-normal> [<https://perma.cc/7XXK-XRZS>] (“Once a niche practice, sustainable investing has become a large and fast-growing major market segment.”); Ogechukwu Ezeokoli et al., *Environmental, Social, and Governance (ESG) Investment Tools: A Review of the Current Field*, U.S. DEP’T LABOR 2 (Dec. 2017), <https://www.dol.gov/asp/evaluation/completed-studies/ESG-Investment-Tools-Review-of-the-Current-Field.pdf> [<https://perma.cc/LN9Y-PD4W>] (“Interest and participation in ESG investing has increased notably in recent years.”); *Sustainable Investing: The Millennial Investor*, ERNST & YOUNG 1 figs.1, 2 (2017), [https://www.ey.com/Publication/vwLUAssets/ey-sustainable-investing-the-millennial-investor-gl/\\$FILE/ey-sustainable-investing-the-millennial-investor.pdf](https://www.ey.com/Publication/vwLUAssets/ey-sustainable-investing-the-millennial-investor-gl/$FILE/ey-sustainable-investing-the-millennial-investor.pdf) [<https://perma.cc/U8KE-T254>] (showing huge recent growth in sustainable investing).

123. *Principles for Responsible Investment: An Investor Initiative In Partnership with UNEP Finance Initiative and the UN Global Compact*, PRINCIPLES RESPONSIBLE INV. 6 (2018), <https://www.unpri.org/download?ac=6134> [<https://perma.cc/7JMH-TJSP>].

124. At the outset of 2012, sustainable investments totaled to \$13.3 trillion globally. *Global Sustainable Investment Review 2014*, GLOBAL SUSTAINABLE INV. ALLIANCE 3 (2014), http://www.gsi-alliance.org/wp-content/uploads/2015/02/GSIA_Review_download.pdf [<https://perma.cc/RW4N-PZCJ>]. By 2016, that figure rose to \$22.89 trillion. *Global Sustainable Investment Review 2016*, *supra* note 12, at 3.

125. *2016 Trends Report Highlights*, *supra* note 12, at 1.

126. EUROSIF, *supra* note 116, at 7; George Serafeim & Jody Grewal, *ESG Metrics: Reshaping Capitalism* 1 (Harv. Bus. Sch., Working Paper No. 116-037, 2019), <https://www.hbs.edu/faculty/Pages/item.aspx?num=50871> [<https://perma.cc/A66X-MJ6M>] (reporting that, between November 2010 and April 2011, capital market participants tried accessing ESG metrics forty-four million times); *Sustainable Investing: The Millennial Investor*, *supra* note 122, at 1 (basing predictions of continued sustainable investing growth on the aging of millennials, who tend to “prefer to invest in alignment with personal values”).

127. Audrey Choi, *Sustainable Investing Enters the Mainstream*, MORGAN STANLEY (Feb. 27, 2015), <https://www.morganstanley.com/ideas/sustainable-investing-enters-mainstream> [<https://perma.cc/BP75-XE8P>] (predicting that sustainability investing growth will likely accelerate as millennials begin investing more); *Sustainable Investing: The Millennial Investor*, *supra* note 122, at 1 (same).

128. See, e.g., BOERSCH, *supra* note 118, at 3 (providing results from a survey of European pension experts showing that most believe that sustainability criteria “will play an increasingly important role in how pension funds make investment decisions” in the future).

S&P 500 companies to disclose their sustainability plans to shareholders.¹²⁹ Meanwhile, Michael Bloomberg has led calls for companies to more fully disclose their climate impacts.¹³⁰ More telling still has been the investor community's advocacy on behalf of the Paris Agreement, the international climate accord signed by 197 countries in December 2015. When President Trump announced that he intended to withdraw the United States from the agreement, dozens of top executives from a wide array of industries took the President to task on Twitter and other social media platforms.¹³¹ On the same day, more than one hundred companies and investors teamed up with American mayors, governors, and university leaders to form the *We Are Still In* campaign—a coalition dedicated to fulfilling the United States' "nationally determined contribution" under the Paris Agreement.¹³² Today, that number has ballooned to more than 1,800 businesses who, together, hold \$2.5 trillion in assets under management.¹³³ American investors and companies have likewise joined forces with their foreign counterparts to voice continued support for the international climate framework. In advance of the G20 summit in Hamburg, for example, nearly 400 institutional investors, representing more than \$22 trillion in assets, signed a public letter urging heads of states to follow through on their Paris commitments.¹³⁴

No one factor explains this remarkable growth of interest in sustainable investing. As business scholars have cautioned, today's sustainability-minded

129. See Matt Turner, *Here Is the Letter the World's Largest Investor, BlackRock CEO Larry Fink, Just Sent to CEOs Everywhere*, BUS. INSIDER (Feb. 2, 2016), <http://www.businessinsider.com/blackrock-ceo-larry-fink-letter-to-sp-500-ceos-2016-2> [<https://perma.cc/R9TK-V62X>].

130. Oliver Ralph, *Michael Bloomberg Urges Companies to Reveal Climate Change Impact*, FIN. TIMES (Feb. 9, 2016), <https://www.ft.com/content/15425194-cefd-11e5-92a1-c5e23ef99c77> [<https://perma.cc/7SKM-Q74X>].

131. See, e.g., Javier E. David, *Big Businesses—Even Energy Companies—Disapprove of Trump's Decision to Walk Away from Climate Deal*, CNBC (June 2, 2017, 11:05 AM ET), <https://www.cnbc.com/2017/06/01/big-businesses-disapprove-of-trumps-decision-to-walk-away-from-paris-accord.html> [<https://perma.cc/Q7GF-Q7AD>] (noting how dozens of top executives from an array of industries publicly opposed President Trump's intended withdraw from Paris); Julia Horowitz & Jethro Mullen, *Top CEOs Tell the CEO President: You're Wrong on Paris*, CNN MONEY (June 2, 2017, 12:43 PM ET), <http://money.cnn.com/2017/06/01/news/ceos-respond-trump-paris-agreement/index.html> [<https://perma.cc/2T4N-C9DV>] (same).

132. See Hiroko Tabuchi & Henry Fountain, *Bucking Trump, These Cities, States and Companies Commit to Paris Accord*, N.Y. TIMES (June 1, 2017), <https://www.nytimes.com/2017/06/01/climate/american-cities-climate-standards.html> [<https://perma.cc/4ZBM-2VCJ>].

133. Mindy Lubber, *In Wake of Trump's Paris Announcement, Investors and Companies Show Remarkable Climate Leadership*, FORBES (July 7, 2017, 8:55 AM), <https://www.forbes.com/sites/mindylubber/2017/07/07/in-wake-of-trumps-paris-announcement-investors-and-companies-show-remarkable-climate-leadership> [<https://perma.cc/Z87B-XQFT>].

134. Nicholas Kusnetz, *200+ Investors Tell Trump: Don't Abandon the Paris Climate Accord*, INSIDE CLIMATE NEWS (May 8, 2017), <https://insideclimatenews.org/news/08052017/investors-trump-paris-climate-accord-g7-g20> [<https://perma.cc/32YZ-E468>]; *Letter from Global Investors to Governments of the G20 Nations*, CERES (July 3, 2017), <https://www.ceres.org/news-center/press-releases/over-200-global-investors-urge-g7-stand-paris-agreement-and-drive-its> [<https://perma.cc/32YZ-E468>].

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investors are not a homogenous group.¹³⁵ They include both retail investors and institutional investors,¹³⁶ and they run the gamut from individuals, family foundations, pension funds, universities, insurance companies, and investment banks.¹³⁷ They are also attracted to sustainability for a variety of reasons.¹³⁸ Some, for example, believe that sustainability leaders will outperform the market.¹³⁹ As such, they seek to maximize their financial returns by exploiting the profit upsides of sustainability.¹⁴⁰ Others, however, view sustainability primarily as a business risk that needs to be minimized. These risk-oriented investors, in turn, focus on mitigating the downsides of unsustainability through strategic divestment plans.¹⁴¹ Still others want better alignment between their sustainability values and their portfolios, but they worry that sustainability leadership may come at the cost of corporate financial performance. They want to bring a sustainability tilt to their portfolio but wish to do so by carefully divesting from unsustainable companies and investing in more sustainable

135. See Joakim Sandberg, *The Heterogeneity of Socially Responsible Investment*, 87 J. BUS. ETHICS 519, 521 (2009) (providing an extensive overview of the variations within the sustainable investment community); Ezeokoli et al., *supra* note 122, at 10 (“Currently, different segments of the investing landscape employ different ESG investment strategies.”); Lewis et al., *supra* note 14, at 9 (documenting a myriad of different sustainability strategies among mainstream investors).

136. While institutional investors account for the majority of sustainable investing, retail investors have increased their share in recent years. In 2014, for example, 13% of sustainable assets held in Canada, Europe, and the United States were retail, while 87% were institutional. Two years later, 26% were retail and 74% were institutional. See *Global Sustainable Investment Review 2016*, *supra* note 12, at 10. According to research analysts, this growth in sustainable investing among retail investors is driven by two groups in particular: women and millennials. See *Rising Interest in SRI*, MACKENZIE INV. 1 (Oct. 2017), <https://www.mackenzieinvestments.com/en/assets/documents/marketingmaterials/mi-rising-interest-in-sri-en.pdf> [<https://perma.cc/SWJ3-PZEZ>]; see also Inst. for Sustainable Investing, *Sustainable Signals: New Data from the Individual Investor*, MORGAN STANLEY 2 (2017), https://www.morganstanley.com/pub/content/dam/msdotcom/ideas/sustainable-signals/pdf/Sustainable_Signals_Whitepaper.pdf [<https://perma.cc/RJ2K-8J96>] (noting that “[m]illennial investors are nearly twice as likely as the general pool” to invest for ESG reasons and that “women [] lead men in their interest in sustainable investing”).

137. See Marc Gunther, *Sustainable Investing: Are Companies Finally Moving Money Away from Fossil Fuels?*, GUARDIAN (Sept. 16, 2015), <https://www.theguardian.com/sustainable-business/2015/sep/16/goldman-sachs-morgan-stanley-merrill-lynch-fossil-fuel-divestment> [<https://perma.cc/Y892-2C6U>]; *Sustainable Investment Joins the Mainstream*, ECONOMIST (Nov. 25, 2017), <https://www.economist.com/finance-and-economics/2017/11/25/sustainable-investment-joins-the-mainstream> [<https://perma.cc/D6VJ-2S3Z>]. This is not to say that all types of investors are equally interested in sustainable investing. For example, a recent working paper by economists at UC Davis and UC Berkeley found that demand for sustainable investing, as compared to more traditional investment vehicles, varies significantly across types of institutional investors. See Brad M. Barber et al., *Impact Investing*, CDAR 4 (Jan. 17, 2017), <https://cdar.berkeley.edu/wp-content/uploads/2017/01/Impact-Investing-170117-12font-1.pdf> [<https://perma.cc/V9YF-8QF3>].

138. For a helpful typology of today’s sustainability minded investors, see Esty & Cort, *supra* note 14, at 26.

139. See Bernow et al., *supra* note 122, at 3 (“For many investors, the likelihood that sustainable investing produces market-rate returns as effectively as other investments has provided convincing grounds to pursue sustainable investment strategies[.]”); Lewis et al., *supra* note 14, at 2 (“The leading driver [of asset owner interest in sustainable investing] is financial in nature: growing evidence of the material link between positive ESG performance and corporate financial performance.”); see also Esty & Cort, *supra* note 14, at 26 (offering a taxonomy of sustainability-minded investors).

140. Busch et al., *supra* note 12, at 312.

141. Bernow et al., *supra* note 122, at 3; Lewis et al., *supra* note 14, at 10 fig.4.

ones—while maintaining appropriate asset-class diversity and minimizing tracking error against investment strategy benchmarks.¹⁴²

Despite this heterogeneity, two main differences emerge between today's sustainability-minded mainstream investors and the socially responsible investors of the past. First, mainstream investors care about their portfolio returns. While socially responsible investors were willing to pursue *their* values without regard to the impact on *their portfolios'* value, mainstream investors want to maintain robust returns even as they align their investments with sustainability principles.¹⁴³ To be sure, many mainstream investors appear ready to sacrifice some profits in exchange for a more sustainable portfolio.¹⁴⁴ But even these investors care about the link between sustainability and corporate financial performance, as they want to carefully calibrate their portfolios to yield a desired mix of sustainability and financial returns.¹⁴⁵ Second, mainstream investors

142. There are, of course, other types of sustainability-minded investors. For example, some may seek to improve corporate sustainability through shareholder activism, rather than by simply redirecting their investments from unsustainable to sustainable companies. See Busch et al., *supra* note 12, at 313; Steve Waygood, *How Do the Capital Markets Undermine Sustainable Development? What Can Be Done to Correct This?*, 1 J. SUSTAINABLE FIN. & INV. 81, 81 (2011) (identifying investor advocacy as one of the primary routes by which capital markets can influence corporate sustainability).

143. See Esty & Cort, *supra* note 14, at 23 (distinguishing mainstream investors from socially responsible investors); Amir Amel-Zadeh & George Serafeim, *Why and How Investors Use ESG Information: Evidence from a Global Survey*, FIN. ANALYSTS J. (forthcoming) (manuscript at 4), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2925310 [<https://perma.cc/K958-7G3S>] (finding evidence in a global survey of 413 senior investment professionals that “the use of ESG information has primarily financial rather than ethical motives”); Bernow et al., *supra* note 122, at 2 (noting that “newer [sustainable investment] strategies typically put less emphasis on ethical concerns and are designed instead to achieve a conventional investment aim: maximizing risk-adjusted returns”); Davidson, *supra* note 120 (observing that BlackRock’s Impact U.S. Equity Fund—an ESG fund launched in October of 2015—had already attracted \$20 million in assets by January of 2016); Mark Fulton et al., *Sustainable Investing: Establishing Long-Term Value and Performance*, DEUTSCHE BANK GROUP 21 (June 2012), https://www.db.com/cr/en/docs/Sustainable_Investing_2012.pdf [<https://perma.cc/9UBG-SE7F>] (“The most modern wave of Sustainable Investors . . . seek a sustained competitive advantage and outperformance, partly by evaluating a company’s overall management ability to adapt to a dynamic business climate and create enduring value.”); Fiona Reynolds, *Mainstream Slow to Accept Benefits of Responsible Investment*, FIN. TIMES (Nov. 16, 2014), <https://www.ft.com/content/a8e2d2c6-69b8-11e4-8f4f-00144feabdc0> [<https://perma.cc/6JLS-XSKB>] (reporting that concerns about financial returns are a major impediment to mainstream investors’ adoption of sustainability strategies).

144. Esty & Cort, *supra* note 14, at 25-26; see also BOERSCH, *supra* note 118, at 3 (survey of pension experts reporting that “the growing [socially responsible investment] trend is being driven much less by the expectation of higher returns or lower risk as it is by public pressure”); Bernow et al., *supra* note 122, at 3 (observing that some mainstream institutional investors adopt sustainable investing practices in response to demands from fund beneficiaries who prioritize sustainability values).

145. Douglas, *supra* note 122, at 103 (observing that investors are primarily concerned with sustainability “issues that are material to financial performance”); Mozaffar Khan et al., *Corporate Sustainability: First Evidence on Materiality 2* (Harvard Bus. Sch., Working Paper No. 15-073, 2015), <https://hbswk.hbs.edu/item/corporate-sustainability-first-evidence-on-materiality> [<https://perma.cc/DH74-TP6U>] (noting that investors’ strategies for integrating ESG factors into their portfolios depend heavily on the materiality of those factors to corporate financial performance); Ezeokoli et al., *supra* note 122, at 11 (“One of the most common critiques of ESG investing is the difficulty for investors to correctly identify, and appropriately weigh, ESG factors in investment selection.”); *Tomorrow’s Investment Rules 2.0*, ERNST & YOUNG 12 (2015), [https://www.ey.com/Publication/vwLUAssets/ey-ccass-institutional-investor-survey-2015/\\$FILE/ey-ccass-institutional-investor-survey-2015.pdf](https://www.ey.com/Publication/vwLUAssets/ey-ccass-institutional-investor-survey-2015/$FILE/ey-ccass-institutional-investor-survey-2015.pdf) [<https://perma.cc/E2HV-HL7T>].

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diverge in their *methods* of integrating sustainability objectives into their portfolios. As noted above, socially responsible investors focus primarily on screening out bad actors.¹⁴⁶ Because their screening criteria are often based on purely nonfinancial considerations, such as a moral aversion to guns or gambling, this investment strategy will often exclude entire industries.¹⁴⁷ Mainstream investors, in contrast, prefer a more structured approach that will enable them to balance their sustainability objectives against their financial priorities. As such, many seek to bring a sustainability *tilt* to their portfolio by strategically divesting from unsustainable companies and investing in sustainable ones.¹⁴⁸

As discussed in the following Section, these differences hold important ramifications for the design of environmental information regulation. The current set of sustainability disclosure regimes—both mandatory and voluntary—cater to the informational needs of socially responsible investors, not mainstream investors. Following in the tradition of environmental information

146. See *supra* note 117-119 and accompanying text.

147. Fulton et al., *supra* note 143, at 20.

148. See Jeroen Derwall et al., *A Tale of Values-Driven and Profit-Seeking Social Investors*, 35 J. BANKING & FIN. 2137, 2138 (2011) (“[M]ost SRI [socially responsible investment] funds reflect a hybrid of negative and positive social responsibility screens”); Amel-Zadeh & Serafeim, *supra* note 143, at 1 (finding that investment professionals perceive negative screening ESG strategies as less beneficial than full integration strategies); Michael Baldinger & Christopher Greenwald, *Long-Term Value Creation: Sustainable Investing for Institutional Investors*, USBS 3-4 (Oct. 24, 2017), https://www.ubs.com/global/en/asset-management/insights/sustainable-and-impact-investing/si-insights/2017/long-term-value-creation/_jcr_content/mainpar/toplevelgrid/coll1/actionbutton.0290369320.file/bGluay9wYXRoPS9jb250ZW50L2RhbS91YnMvaW5zaWdodHMvc3VzdGFpbmFibGUtaW52ZXN0aW5nLWZvcj1pbmN0aXRldGlVbmFsLWludmVzdG9ycy5wZGY=/sustainable-investing-for-institutional-investors.pdf [<https://perma.cc/7CKV-XUGL>] (arguing for sustainable investing to move beyond “negative screening” strategies, which cannot satisfy mainstream investors preferences for screening procedures that provide “additional, value-adding insights into the long-term risks and opportunities of companies”); Bernow et al., *supra* note 122, at 2-3 (documenting how sustainable investment strategies are moving away from pure negative screening and toward “ESG integration, which is the systematic and explicit inclusion of ESG factors in financial analysis”); Davidson, *supra* note 120 (noting a shift in the sustainable investment community from using negative screens to “eliminate whole sectors” to using more tailored ESG investment strategies to “judge companies individually”); Fulton et al., *supra* note 143, at 20-21 (tracing the evolution of sustainable investing from purely negative screening to value-enhancing investment strategies); *In Unprecedented Response, Investors Call on SEC to Improve Reporting of Climate Risks and Other Sustainability Challenges*, CERES (July 20, 2016), <https://www.ceres.org/news-center/press-releases/unprecedented-response-investors-call-sec-improve-reporting-climate> [<https://perma.cc/A8R6-QK6T>] (“We look to the SEC to require the corporate reporting investors need to both assess risk and opportunity brought by climate change.” (quoting Anne Simpson, Investment Director at the California Public Employees’ Retirement System, the largest public pension fund in the United States (emphasis added))); Lewis et al., *supra* note 14 (presenting the results of a survey of asset owners showing that about a fifth employ positive sustainability screens, the most common being climate-related investment screens); *Performing for the Future: ESG’s Place in Investment Portfolios*, STATE ST. GLOB. ADVISORS 9 (2017), <https://www.ssga.com/investment-topics/environmental-social-governance/2017/esg-institutional-investor-survey-us.pdf> [<https://perma.cc/3YJ7-5YMJ>] (providing survey results indicating that “many investors have moved beyond negative screening and now employ other ESG strategies within a broader approach”); Stewart et al., *supra* note 14, at 11-12 (including a survey of large investors showing that, among those who adopted sustainability strategies, more than half used sustainability factors to *screen in* investments).

regulation more generally, they create a series of red lights that spotlight sustainability laggards—facilitating “negative screening” by broader industry categories and subpar company performance. But they do not create a companion set of *green* lights capable of guiding profit-minded investors toward sustainability leaders. As a result of this information deficit, *implementation* of sustainability investing practices has lagged behind mainstream investors’ *interest* in sustainability.

C. Informational Barriers to Sustainable Investing

Despite sustainability’s remarkable move into the mainstream, scholars and industry analysts generally agree that investor interest in sustainability has outstripped their adoption and integration of sustainable investment practices.¹⁴⁹ Accounting for sustainability factors in portfolio design continues to be the exception, rather than the rule. In the United States, for instance, sustainable investments—if construed very broadly—account for about a fifth of total assets under management.¹⁵⁰ Likewise, a survey of more than 1,100 large asset owners revealed that less than a quarter incorporated sustainability strategies in their investment policies.¹⁵¹ Even among investors who consider sustainability to be relevant to their portfolios, few have systematically integrated sustainability factors into their investment decisionmaking process.¹⁵² Rarely do asset owners

149. See, e.g., Friede et al., *supra* note 16, at 210-11; Falko Paetzold & Timo Busch, *Unleashing the Powerful Few: Sustainable Investing Behaviour of Wealthy Private Investors*, 27 *ORG. & ENV’T* 347, 348 (2014) (commenting that “[f]or private investors there seems to be a dichotomy between interest in SI [sustainable investing] and actual engagement in SI”); Jonathan Bailey et al., *Sustaining Sustainability: What Institutional Investors Should Do Next on ESG*, MCKINSEY & CO. 1 (2016), <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/sustaining-sustainability-what-institutional-investors-should-do-next-on-esg> [<https://perma.cc/6FAL-PZPP>] (“[I]t’s clear that many investors have struggled to convert their commitment [to sustainable investing] into practice.”); Lewis et al., *supra* note 14, at 4 (“Despite the promise, only a small proportion of these investors’ assets are managed under sustainable investing practices.”).

150. *Global Sustainable Investment Review 2016*, *supra* note 12, at 7 tbl.2 (showing in Table 2 that sustainable investments accounted for 21.6% of total managed assets in the United States in 2016); see also Rebecca O’Neill, *Closing the Sustainability-Investor Relations Gap*, SUSTAINABILITY 12 (2016), <https://sustainability.com/wp-content/uploads/2016/12/SA-ES-Report-Web-Spreads.pdf> [<https://perma.cc/7G93-DR8N>] (“According to a 2014 Nasdaq Advisory Services study of 500 publicly traded companies, barely one-fifth of US companies were integrating sustainability into their investor communications.”).

151. Stewart et al., *supra* note 14, at 3; see also Council on Found. & Commonfund Inst., *Council on Foundations—Commonfund Study of Responsible Investing: Foundations Survey 2016*, COMMONFUND 2 (June 2016), <https://www.commonfund.org/wp-content/uploads/News-and-Research/02-Whitepapers-PremiumContent/CCSF-Responsible-Investing-Survey/2016-06-CF-Study-of-Responsible-Investing.pdf> [<https://perma.cc/5QCS-VP8W>] (showing that in a 2014 survey of large foundations representing \$39.7 billion in endowment assets, only about a quarter report that their investment policy statement permitted or referred to responsible investing); *Tomorrow’s Investment Rules 2.00*, *supra* note 145, at 7 fig. E.1 (finding that only about a third of the two hundred institutional investors surveyed in 2015 used “structured, systematic methods to evaluate ESG [factors]”).

152. See Bernow et al., *supra* note 122, at 9 (observing that only “[a] few funds have begun to systematically assess how their entire portfolios are exposed to material ESG risks (notably, climate change and energy consumption)”); *A Blueprint for Responsible Investment: Genesis, Assumptions, and Process*, PRINCIPLES RESPONSIBLE INVESTING 16,

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move beyond high-level conversations about sustainability to build out specific sustainability strategies, and few investment professionals put sustainability principles into practice on a regular basis.¹⁵³

What explains this gap between interest and implementation? Although there are several contributors, as discussed below, the chief culprit is a dearth of reliable sustainability metrics and data that materially relate to corporate financial performance. In survey after survey, investors and analysts report that they do not have the information necessary to operationalize their interests in bringing a sustainability lens to their investment decisions.¹⁵⁴ Research conducted by scholars and industry experts has similarly confirmed that limitations in existing sustainability data act as a key barrier to the adoption of sustainable investing practices by mainstream investors.¹⁵⁵ Moreover, this ESG

<https://www.unpri.org/download?ac=1919> [<https://perma.cc/5J9R-95Y5>] [hereinafter *Blueprint for Responsible Investment*] (finding that, among investment managers, “systemic and truly insightful incorporation of ESG issues across a firm’s entire spectrum of assets is still relatively rare”); Reynolds, *supra* note 143.

153. See Bailey et al., *supra* note 149, at 1-2 (“While ESG and corporate-governance teams are commonplace, they are often held at arm’s length from core investment activities.”); *Blueprint for Responsible Investment*, *supra* note 152, at 38 (2017) (finding that the majority of PRI signatories “do not regularly consider climate change as a factor in their investment policy or decisionmaking”); Friede et al., *supra* note 16, at 211 (reporting that “just about 10% of global professionals receive formal training on how to consider ESG criteria in investment analysis”).

154. For example, based on interviews with more than one hundred asset owners and investment professionals, a 2016 report by the World Resources Institute identified limitations in sustainability data as a key barrier to the adoption of sustainable investing practices by mainstream investors. See Lewis et al., *supra* note 14, at 3 (“While reams of ESG data exist, key limitations restrict their broader use in mainstream investment decision making.”). A 2016 survey of large foundations, as well as a 2012 survey of asset owners and a 2012 survey of investment professionals, reached similar conclusions. See Council on Funds. & Commonfund Inst., *supra* note 151, at 13 (2016) (“One of the more urgent issues confronting those trying to develop their integration of ESG factors is the relative dearth of reliable metrics by which to measure progress.”); Stewart et al., *supra* note 14, at 16; Michael Sadowski, *Rate the Raters Phase Five: The Investor View*, SUSTAINABILITY (Nov. 2012), https://sustainability.com/wp-content/uploads/2016/07/rtr_phase5_investor_view.pdf [<https://perma.cc/A7TZ-3WSV>].

155. See, e.g., Busch et al., *supra* note 12, at 304-05 (identifying the lack of trustworthy ESG data as a major barrier to sustainable investing); Danielle Chesebrough et al., *2016 Report on Progress*, SUSTAINABLE STOCK EXCHANGES 29 (2016), http://unctad.org/en/PublicationsLibrary/unctad_sse_2016d1.pdf [<https://perma.cc/22EF-MAQD>] (“[T]he current state of ESG disclosure is not sufficient for investor needs.”); *Exploring ESG: A Practitioner’s Perspective*, BLACKROCK 8 (June 2016), <https://www.blackrock.com/investing/literature/whitepaper/viewpoint-exploring-esg-a-practitioners-perspective-june-2016.pdf> [<https://perma.cc/65XV-8EZC>] (“There is a need for comprehensive, standardized, and comparable data to accurately measure how companies are managing relevant ESG issues.”); Laura Gitman et al., *ESG in the Mainstream: The Role for Companies and Investors in Environmental, Social, and Governance Integration*, BSR 20 (2009), https://www.bsr.org/reports/BSR%20ESG%20Integration%20Report%20_Sept%202009_final.pdf [<https://perma.cc/WT5W-SR59>] (“The lack of consistent and comparable ESG data has been one of the most substantial and pervasive barriers to ESG integration.”); Lewis et al., *supra* note 14, at 3 (“ESG data, disclosure standards, and performance metrics are inadequate.”); Lewis & Pinchot, *supra* note 120 (identifying poor ESG data quality as a major barrier to continued growth in sustainable investing); Rory Sullivan et al., *Fiduciary Duty in the 21st Century*, UNEP FIN. INITIATIVE 9 (2014), https://www.unepfi.org/fileadmin/documents/fiduciary_duty_21st_century.pdf [<https://perma.cc/C5ZN-JZGZ>] (identifying as a major challenge “[i]nconsistency in corporate reporting, including inadequate analysis of the financial materiality of ESG issues, making it hard to assess investment implications”);

data problem exacerbates other commonly cited barriers to sustainable investment growth. For example, studies suggest that many mainstream investors are reluctant to engage in sustainable investing without more robust estimates of the effects of corporate sustainability initiatives on company profits.¹⁵⁶ However, as noted above, some of this empirical uncertainty can be traced to problems with the quality and methodologies of the underlying sustainability data.¹⁵⁷ Addressing the sustainability metrics problem could therefore help remove this second obstacle to sustainable investing by enabling academics to more accurately model the relationship between ESG performance and financial performance. Better sustainability data would also likely help alleviate two other widely discussed barriers, namely: (1) investors' lack of familiarity with ESG issues, and (2) institutional investors' concerns that sustainable investing conflicts with their fiduciary duties to their clients.¹⁵⁸ As to the first, it borders on tautological to note that investors' knowledge of ESG issues depends on their access to ESG information. Accordingly, making sustainability data more useable and more relevant to mainstream investors will help increase the investor community's exposure to, and understanding of, sustainable investing. For similar reasons, better sustainability data may help lessen investors' fiduciary duty concerns, which primarily stem from the belief that asset owners and advisers cannot take into account ESG factors when they make investment decisions because they have a legal obligation to maximize portfolio returns.¹⁵⁹ To begin, such concerns are often overstated, as fiduciary duty laws in many countries, including the United States, allow institutional investors to integrate ESG considerations into their portfolios.¹⁶⁰ That said, improvements in sustainability data can help mitigate these concerns by clarifying the profit upsides to corporate sustainability and by empowering investors to better manage any trade-offs between sustainability and financial returns. Thus, solving the sustainability data problem promises not only to remove a major obstacle to sustainable investing, but also to help mitigate a number of other barriers that are currently impeding the adoption of ESG investment practices.

Tomorrow's Investment Rules 2.0, *supra* note 145, at 19 ("Investors say repeatedly that they do not receive enough accurate, standardized nonfinancial [ESG] information relevant to companies' risk and performance assessment.").

156. *See, e.g.*, Lewis et al., *supra* note 14, at 3.

157. *See supra* notes 111-115.

158. *See* Sullivan et al., *supra* note 155, at 16.

159. *Id.*

160. *See id.* Indeed, the U.S. Department of Labor released an Interpretive Bulletin (IB 2015-01) in October 2015 that expressly notified fiduciaries of retirement pension plans that they may consider ESG factors without violating their fiduciary duties under the Employee Retirement Income Security Act (ERISA). *See* Interpretive Bulletin Relating to the Fiduciary Standard under ERISA in Considering Economically Targeted Investments, 80 Fed. Reg. 65135, 65136 (Oct. 26, 2015) ("[T]he Department does not believe ERISA prohibits a fiduciary from . . . incorporating ESG factors in investment policy statements or integrating ESG-related tools, metrics, and analyses to evaluate an investment's risk or return or choose among otherwise equivalent investments.").

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Admittedly, the idea that investors need *more* sustainability metrics appears counterintuitive at first glance, given that the sustainability metrics industry has boomed in recent years. For example, the global number of reporting instruments that either require or encourage disclosure of sustainability related information has grown from 19 in 2006 to nearly 400 in 2016.¹⁶¹ Presently, about 95% of the 250 largest companies globally¹⁶² issue sustainability reports, as do 75% of S&P 500 companies.¹⁶³ Numerous data providers have, in turn, synthesized and packaged this information into hundreds of different sustainability metrics that “score” corporations on a variety of different sustainability-focused dimensions.¹⁶⁴

A closer examination, however, reveals two problems with existing sustainability metrics that limit their usefulness to mainstream investors—the first pertaining to *what* they measure, the second pertaining to *how* they measure it. Regarding the former, today’s metrics largely follow the design and logic of traditional environmental information regulation.¹⁶⁵ That is, they are built to spotlight sustainability laggards, but not sustainability leaders.¹⁶⁶ As Professors Daniel Esty and Todd Cort note in their careful survey of existing sustainability metrics, most ESG frameworks focus on sustainability risks and downsides.¹⁶⁷

161. Wim Bartels et al., *Carrots & Sticks: Global Trends in Sustainability Reporting Regulation and Policy*, KPMG 9 (2016), <https://assets.kpmg/content/dam/kpmg/pdf/2016/05/carrots-and-sticks-may-2016.pdf> [<https://perma.cc/BWB4-TPPH>]. This study defined sustainability reporting instruments to include both government disclosure regulations or policies and NGO-published disclosure standards, guidance, and recommendations. *Id.* at 8.

162. Ernst & Young & B.C. Ctr. for Corp. Citizenship, *Value of Sustainability Reporting*, ERNST & YOUNG 2 (2016), [https://www.ey.com/Publication/vwLUAssets/EY_-_Value_of_sustainability_reporting/\\$FILE/EY-Value-of-Sustainability-Reporting.pdf](https://www.ey.com/Publication/vwLUAssets/EY_-_Value_of_sustainability_reporting/$FILE/EY-Value-of-Sustainability-Reporting.pdf) [<https://perma.cc/ZKY4-PZAK>].

163. Eric Nitzberg, *The Wild West of Measuring Corporate Sustainability*, STAN. SOC. INNOVATION REV. (Jan. 27, 2016), https://ssir.org/articles/entry/the_wild_west_of_measuring_corporate_sustainability [<https://perma.cc/MNB3-T4HE>].

164. Leading sustainability data providers include: MSCI, Bloomberg, and Thomson Reuters. See Esty & Cort, *supra* note 14, at 21-23. For a review of sustainability data providers and sustainability data products, see Douglas, *supra* note 122, at 94-100; and Betty Moy Huber & Michael Comstock, *ESG Reports and Ratings: What They Are, Why They Matter*, HARV. L. SCH. F. ON CORP. GOVERNANCE & FIN. REG. (July 27, 2017), <https://corpgov.law.harvard.edu/2017/07/27/esg-reports-and-ratings-what-they-are-why-they-matter> [<https://perma.cc/8QBW-HY9Z>].

165. See Diana Glassman et al., *The Missing Metrics That Matter to Investors: How Companies Can Develop ESG Financial Value Creation Metrics*, 8 J. ENVTL. INVESTING 206, 215 (2017) (“For the most part, traditional social and environmental metrics are designed to measure the societal value—beyond economic growth and jobs—that companies produce. However, traditional ESG metrics are less useful for investors whose primary need is to determine if a company’s ESG performance increases, decreases, or has minimal impact on its current and future financial performance.”).

166. See Glassman, *supra* note 165, at 216 (“Mainstream investors have primarily used ESG metrics as indicators of risk, highlighting governance weaknesses and the potential environmental and social controversies that can arise from governance failures. Because they were not designed to measure financial value, ESG metrics have proven ill-suited to helping investors discern the financial impact of companies’ ESG performance.”); Lewis et al., *supra* note 14, at 36 (concluding that sustainability metrics are often “backward-looking and risk-focused,” which limits their usefulness to mainstream investors).

167. Esty & Cort, *supra* note 14, at 29-31.

Few seek to capture the potential profit upsides to sustainability leadership—such as when companies position themselves to thrive by providing energy efficient products that will command increasing market share in a world with more widespread carbon pricing.¹⁶⁸ As a result, they miss a key factor that distinguishes sustainability leaders from the pack: their efforts to make sustainability a driver of financial success.

Moreover, the current data are not tightly focused on sustainability factors that materially relate to financial performance. Too often, they are based on a firm's past reputation on sustainability issues (as often measured by negative media reports) rather than its current or future sustainability operations.¹⁶⁹ Thus, for example, existing sustainability scorecards might flag Dow Chemical (now Dow DuPont) as an environmental laggard for its long history of problematic pollution practices but fail to recognize the company's recent move to integrate sustainability into its core business model.¹⁷⁰ While a socially responsible investor might care about the former, mainstream investors will be more interested in the latter. That is, they want *forward-looking* metrics that track sustainability strategies that can potentially deliver future financial growth.¹⁷¹ In line, however, with the red-lights model of environmental information regulation, many of today's sustainability metrics have not been designed with financial value in mind.¹⁷² Rather, they seek to identify sustainability laggards

168. See Douglas, *supra* note 122, at 107 (discussing the investment community's need for forward-looking metrics to identify future sustainability risks and opportunities). This omission is somewhat surprising given that several scholars have proposed frameworks for measuring sustainability growth opportunities. *E.g.*, Steve Lydenberg et al., *From Transparency to Performance: Industry-Based Sustainability Reporting on Key Issues*, INITIATIVE RESPONSIBLE INV. 24-25 (2010), [<https://perma.cc/GZF6-KZ7J>] (explaining the methodology behind sustainability "innovation indicators"); Glassman, *supra* note 165, at 217-23 (proposing a framework for ESG value creation metrics).

169. See Aaron K. Chatterji et al., *How Well Do Social Ratings Actually Measure Corporate Social Responsibility?*, 18 J. ECON. & MGMT. STRATEGY 125, 125 (2009) (finding that KDL's sustainability metrics were predictive of past environmental performance but not future environmental performance); Maria Egan, *ESG Is Incomplete: An Investor's Perspective*, GREENBIZ (Sept. 6, 2017, 1:40 AM), [<https://www.greenbiz.com/article/esg-incomplete-investors-perspective>] [<https://perma.cc/G86A-RAUF>] (observing that ESG data look backward, while investors want to know how ESG factors "will affect the company and its financial performance in the future"); Lewis et al., *supra* note 14, at 36 ("[O]ften, the orientation of the analysis is backward-looking and risk-focused. This perspective means that the analyses offer limited insight on the positive ESG impact of potential investments, which was identified as important by a number of participants."); Directorate-Gen. for Justice & Consumers, *Summary of the Responses to the Public Consultation on Long-term and Sustainable Investment*, EUR. COMM'N 19 (2016), [http://ec.europa.eu/information_society/newsroom/image/document/2016-44/feedback_final_pc_30068_en_19173.pdf] [<https://perma.cc/MZE2-5UZY>] (reporting that "most ESG research focu[s]ed on processes and consisted of short-term and backward looking indicators").

170. Esty & Cort, *supra* note 14, at 30.

171. World Bus. Council for Sustainable Dev. & UNEP Fin. Initiative, *Translating ESG into Sustainable Business Value: Key Insights for Companies and Investors*, UNEP FIN. INITIATIVE 11 (Mar. 2010), [<https://www.unepfi.org/fileadmin/documents/translatingESG.pdf>] [<https://perma.cc/6XHA-FYC7>] (reporting that asset managers want forward-looking ESG metrics).

172. See Cohen, *supra* note 7, at 10427 ("Current government-mandated disclosure programs tend to ignore indicators of future environmental performance such as the existence of sound environmental management practices, environmental research and development, new management and/or new initiatives designed to improve environmental performance, etc. However, these indicators tend to

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across a dizzyingly vast array of sustainability dimensions, only a few of which are material to corporate financial performance.¹⁷³ As a result, existing sustainability metrics—with their focus on sustainability laggards and their lack of focus on business fundamentals—often fail to satisfy the information needs of mainstream investors.¹⁷⁴

Put simply, mainstream investors need more green-light sustainability metrics that are keyed to the identifying characteristics of sustainability leaders. These metrics might track, for example, the share of revenue that a company derives from selling sustainable products or services, the amount of cost savings generated from a firm's eco-efficiency initiatives, and the level of investment that a company sinks into clean technology research and development. These types of measures would help distinguish leading companies who seek to make sustainability a core driver of revenue growth from those who merely work to mitigate the risks of sustainability at the margins.¹⁷⁵

In a similar vein, green-light metrics should also focus investors' attention on the degree to which firms are integrating sustainability considerations into their operational practices and business strategies. Such measures might include, inter alia, whether the company's board has approved a sustainability action plan, created a centralized sustainability team for coordinating and implementing that plan, implemented internal incentives to encourage sustainability thinking by its decisionmakers (e.g., tying executive bonuses to sustainability targets or using an internal carbon price when making investment decisions), and established internal mechanisms to monitor progress on sustainability objectives. While these types of disclosures would provide key information on how sustainability considerations factor into a company's everyday operations, it is also important to develop green-light metrics that capture a company's future sustainability plans. Such forward-looking measures might include, for example, a company's

be used by private ratings organizations, e.g., Innovest, SAM Sustainability Group, as important predictors of future performance.”).

173. A recent study of ninety-four Canadian companies found, for example, that these corporate sustainability reports contained as many as 585 different indicators of sustainability performance, with little overlap. This diversity of sustainability metrics speaks to the system's lack of focus on *material* issues and data comparability that makes benchmarking possible. See Laurence Clement Roca & Cory Searcy, *An Analysis of Indicators Disclosed in Corporate Sustainability Reports*, 20 J. CLEANER PRODUCTION 103, 103 (2012); see also Lydenberg et al., *supra* note 168, at 9 (discussing a PricewaterhouseCoopers analysis of corporate sustainability reports that found that “because companies take varying approaches to CSR reporting, it can be challenging to assess companies' actual performance, or to gauge their efforts in comparison to one another”).

174. See *Sustainability Disclosure: Getting Ahead of the Curve*, DELOITTE 5 (2016), <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/risk/us-risk-sustainability-disclosure.pdf> [<https://perma.cc/NAQ6-CC9C>] (reviewing survey data showing that “over 80 percent of investors are dissatisfied by how ESG risks and opportunities are identified and quantified in financial terms” (internal quotations omitted)); *Tomorrow's Investment Rules 2.00*, *supra* note 145, at 22-23 (attributing institutional investors' current dissatisfaction with ESG data to the fact that these data are not designed to serve the needs of investors).

175. Lubin & Esty, *supra* note 79, at 4 (discussing the need for a value-driver ESG disclosure framework that tracks sustainability-driven revenue growth, productivity, and risk).

future revenue projections for sustainable products and services, as well as a company's own internal targets for reducing pollution, energy, and waste.¹⁷⁶

Expanding the array of sustainability green lights, however, would only solve part of the problem. Sustainability metrics are only as useful to investors as they are trustworthy, and today's sustainability scorecards suffer from several methodological problems that severely undermine investor confidence in the data's accuracy.¹⁷⁷ First, the reporting coverage for any given sustainability metric remains small, in large part because most sustainability measures are based on self-reported, voluntarily disclosed data.¹⁷⁸ For example, only about two percent of companies worldwide report their greenhouse gas emissions to the Carbon Disclosure Project, one of the most widely used climate-related disclosure programs for companies.¹⁷⁹ Likewise, the Global Reporting Initiative (GRI)—the largest voluntary reporting regime for sustainability—contained data on less than 1,400 companies in 2015, which amounts to less than two percent of publicly traded companies worldwide.¹⁸⁰ Moreover, because firms are free to pick and choose which metrics to disclose, reporting rates for any single GRI metric are even lower.¹⁸¹ This inconsistency in coverage impedes investors' ability to meaningfully compare sustainability performance across broad swaths of their portfolios.¹⁸²

176. Notably a company's incentives to overstate its future sustainability gains would likely be tempered by the financial penalties that it would risk from failing to meet its targets. Furthermore, investors could assess the reliability of a company's future sustainability targets by cross-referencing them against metrics concerning the company's current sustainability operations, practices, and management. Ambitious sustainability predictions that are not supported by present-day investments in sustainability practices and procedures would raise red flags for investors looking to bet on tomorrow's sustainability leaders.

177. See Chatterji et al., *supra* note 169, at 125 (finding that the "environmental strengths" metrics of a prominent sustainability data provider are poor predictors of actual environmental performance); *Exploring ESG*, *supra* note 155, at 8; Gitman et al., *supra* note 155, at 20 ("The lack of specific mandated disclosures means that even among leading corporate responsibility/sustainability reports, the data are likely to vary on issues covered and methods for measurement.")

178. Esty & Cort, *supra* note 14, at 34; Lewis et. al., *supra* note 14, at 37 (observing that most sustainability metrics are based on voluntary self-disclosure by companies); Morrow & Yow, *supra* note 12, at 5 (finding that "the world's large listed companies—essentially the complete set of global mid- and large-cap equities—are failing to disclose their performance on seven basic sustainability metrics"). For a detailed discussion of why voluntary disclosure regimes result in the under-reporting of sustainability information, see *infra* Section III.A.

179. Esty & Cort, *supra* note 14, at 36; see also *CDP-SDSB Response to BIS: Publication of Draft Regulations for Narrative Reporting*, CLIMATE DISCLOSURE STANDARDS BD. 2 (Nov. 2012), https://www.cdsb.net/sites/cdsbnet/files/cdp-cdsb_joint_consultation_response_-_bis_narrative_reporting_0.pdf [<https://perma.cc/ZZH5-QS4B>] ("CDP now holds the largest collection globally of primary climate change and water data . . .").

180. Esty & Cort, *supra* note 14, at 36.

181. *Id.* at 36-37; see also Douglas, *supra* note 122, at 104 (discussing how voluntary reporting leads to selective ESG disclosures).

182. See Lewis et. al., *supra* note 14, at 35; *Sustainability Goes Mainstream: Insights into Investor Views*, PRICEWATERHOUSECOOPERS 8 (May 2014), <https://businessfacilities.com/wp-content/uploads/2014/05/pwc-sustainability-goes-mainstream-investor-views.pdf> [<https://perma.cc/2MRQ-LVGZ>] (reporting that nearly eighty percent of surveyed institutional investors were dissatisfied by the "comparability of sustainability reporting between companies in the same industry"); *Tomorrow's Investment Rules 2.00*, *supra* note 145, at 24 ("Survey data indicates that investors

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The absence of consistent and transparent methodological standards for collecting and preparing sustainability data further undermines investor confidence.¹⁸³ For example, data providers vary in how they address missing data: some use statistical techniques—such as averaging—to impute values to nonresponses, while others replace missing data with low scores in order to penalize companies for failing to disclose.¹⁸⁴ Likewise, they differ in the frequency with which they update their sustainability data, meaning that one metric might correspond to 2017 data while another refers to 2005 data.¹⁸⁵ Scholars and investors have also criticized existing sustainability metrics for failing to consistently normalize the underlying data with respect to key company characteristics, preventing “apples-to-apples” comparisons across firms.¹⁸⁶ At the same time, the fact that third-party verification of self-reported sustainability data remains a minority practice breeds further distrust.¹⁸⁷ Together, these methodological inconsistencies have worked to reduce investors’ confidence in—and use of—sustainability metrics.¹⁸⁸

are especially eager to measure a company’s nonfinancial performance against that of its sector peers and to link a company’s nonfinancial information to its expected performance.”)

183. Douglas, *supra* note 122, at 103 (identifying methodological inconsistencies as “a major data quality challenge” for sustainability metrics); Daniel C. Matisoff et al., *Convergence in Environmental Reporting: Assessing the Carbon Disclosure Project*, 22 *BUS. STRATEGY & ENV’T* 285, 296 (2013) (documenting how changes in the Carbon Disclosure Project’s survey of corporate greenhouse emissions hampers comparative analyses over time); Lewis et. al., *supra* note 14, at 3 (identifying inconsistencies across sustainability indicators as a major impediment to sustainable investment growth); *Sustainability Disclosure: Getting Ahead of the Curve*, *supra* note 174, at 5 (“Complicating matters further, sustainability reporting and disclosure, in many cases, currently lacks the discipline of established management systems, processes, and controls exhibited by financial reporting.”).

184. Esty & Cort, *supra* note 14, at 3; *see also* Timothy M. Doyle, *Ratings that Don’t Rate: The Subjective World of ESG Ratings Agencies*, AM. COUNCIL FOR CAPITAL FORMATION 8-9 (July 2018), http://accfcorgov.org/wp-content/uploads/2018/07/ACCF_RatingsESGReport.pdf [<https://perma.cc/P4P7-HNV2>] (highlighting the absence of standardized methodologies for producing ESG data).

185. *See* Morrow & Yow, *supra* note 12, at 7 (recommending that “policymakers take the necessary steps to minimize the time gap between companies’ financial and sustainability reporting cycles”).

186. Larger companies, for example, tend to pollute more in the aggregate, even though they might have lower emissions per output than their smaller counterparts. *See* Busch et al., *supra* note 12, at 316 (observing that sustainability information “is not very standardized and harmonized, which makes its interpretation for investment decision makers even more difficult”); Esty & Cort, *supra* note 14, at 37-38; Doyle, *supra* note 184, at 9-12 (discussing company-size, geographic, and industry biases in ESG metrics); *Tomorrow’s Investment Rules 2.00*, *supra* note 145, at 25 (“Investors consistently affirm their desire for disclosures [on ESG factors] that allow the apples-to-apples comparison of companies, but lament the fact that conducting such comparisons is often difficult and time consuming.”).

187. *See* Davidson, *supra* note 120 (identifying distrust of sustainability data as a key hurdle to the sustainable investment movement); *The KPMG Survey of Corporate Responsibility Reporting 2013*, KPMG INT’L 33 (Dec. 2013), <https://assets.kpmg/content/dam/kpmg/pdf/2015/08/kpmg-survey-of-corporate-responsibility-reporting-2013.pdf> [<https://perma.cc/NKN8-Z2GN>] (finding that rates of assurance among the 100 largest companies in 41 countries were less than 50%).

188. Sadowski, *supra* note 154, at 10, 12 (finding in a survey of one thousand investment professionals that only forty percent were “very” or “extremely” satisfied with existing sustainability metrics, while nearly half recommended that data providers improve the transparency of their metric’s methodologies); *Tomorrow’s Investment Rules 2.00*, *supra* note 145, at 21 (“Against this

To be clear, many sustainability data providers understand—and are taking steps to address—the problems identified above. To take just one example, MSCI, a leader in the field of sustainability analytics, recently developed the MSCI ACWI Sustainable Impact Index, which uses an array of targeted sustainability factors to identify sustainability leaders.¹⁸⁹ Meanwhile, several data providers are attempting to incorporate companies' forward-looking sustainability policies and management plans into their metrics databases.¹⁹⁰ Still others have taken steps to encourage third-party auditing and verification of self-disclosed corporate sustainability data.¹⁹¹ However, as discussed in the following Section, economic theory suggests that voluntary disclosure regimes alone cannot efficiently harness mainstream investor interest in sustainability. Instead, this Article argues that the sustainability-information deficit is best addressed by developing a new model of information regulation that is tailored to the priorities and needs of the mainstream investor.

III. Sustainability Information Regulation for the Mainstream Investor

To fully harness investor interest in sustainability, this Article calls for a mandatory sustainability reporting regime that provides investors with both sustainability red lights and green lights.¹⁹² In doing so, it recognizes that such a proposal deviates from the traditional understanding of environmental

current backdrop of uneven nonfinancial [ESG] information from companies, it comes as little surprise that more than one-quarter of respondents report that companies' non-financial performance did not play a pivotal role in their investment decisions even once during the previous year.”)

189. See *MSCI ACWI Sustainable Impact Index*, MSCI, <https://www.msci.com/msci-acwi-sustainable-impact-index> [<https://perma.cc/RW3N-ELY8>] (“The MSCI ACWI Sustainable Impact Index aims to identify companies that derive at least 50% of their revenues from products and services that address environmental and social challenges”); see also Esty & Cort, *supra* note 14, at 24-25 (describing these and other efforts by ESG data providers to develop metrics that focus on material sustainability factors).

190. Douglas, *supra* note 122, at 107 (reviewing some of these efforts to develop future-oriented sustainability metrics); Ezeokoli et al., *supra* note 122, at B-15 (noting that the HIP Investor Rating produces a sustainability score that seeks to “quantif[y] the mitigators of future risk and drivers of return potential”); *Overview of ESG Rating Agencies*, NOVETHIC 43 (Oct. 2014), https://www.novethic.fr/fileadmin/user_upload/tx_ausynovethicetudes/pdf_complets/2014_Overview-of-ESG-rating-agencies.pdf [<https://perma.cc/SN36-LFWG>] (observing that “South Pole Carbon offers a forward-looking climate impact assessment together with the [Climate Disclosure Project]: it gives investees[] individual positioning towards the risks and opportunities of climate change”).

191. For example, the World Business Council for Sustainable Development's Assurance Project aims to “inspire interest in external assurance amongst [its] members, informing and preparing them for such engagements and an approach for reporters and assurance providers to maximize value creation and reduce inefficiency.” *Assurance: Generating Value from External Assurance of Sustainability Reporting*, WORLD BUS. COUNCIL FOR SUSTAINABLE DEV. 2 (Feb. 2016), https://docs.wbcsd.org/2016/02/WBCSD_Redefining_assurance_guide.pdf [<https://perma.cc/8S56-KN8V>] [hereinafter *Generating Value*].

192. Others have called for new mandatory reporting requirements of environmental performance information. See, e.g., Case, *supra* note 1, at 387. However, this Article departs from past literature by calling for a disclosure regime that is tailored to the needs of mainstream investors. It therefore advocates for a new model of information regulation that is focused on business fundamentals and capable of guiding capital markets away from sustainability laggards and toward sustainability leaders.

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information regulation as a tool used primarily for spotlighting bad environmental behavior. But, as Section III.A discusses, the public nature of sustainability metrics justifies this reorientation of environmental information regulation. Section III.B then outlines several core principles for developing a mandatory sustainability disclosure regime that can address the needs of mainstream investors. Section III.C concludes by arguing that the benefits of such a regulation outweigh the costs.

A. Economic Rationale for Mandatory Disclosure

Can the private sector address the sustainability information needs of today's mainstream investors without government help or a mandatory disclosure regime? Such an outcome is possible in theory. Voluntary disclosures on key sustainability metrics could, for example, increase as a result of mounting pressures from shareholders.¹⁹³ Likewise, data providers might eventually reformulate their sustainability metrics to better address the informational needs of mainstream investors.¹⁹⁴ Over time, market pressures and greater stakeholder dialogue could transform today's largely voluntary disclosure framework into a vehicle capable of maximizing investors' appetite for sustainability.¹⁹⁵

Three characteristics of corporate sustainability metrics, however, suggest that voluntary reporting schemes alone will not adequately or efficiently overcome the informational barriers to sustainable investing.¹⁹⁶ First, information on corporate sustainability practices is—like nearly all forms of information—a public good.¹⁹⁷ Firms cannot easily limit the consumption of sustainability information once publicized (i.e., information is nonexcludable), and use of such information does not reduce its availability to other parties (i.e.,

193. See, e.g., Andrea Vittorio, *Investors to SEC: We Want Better Sustainability Reporting*, BLOOMBERG BNA (July 26, 2016), <https://www.bna.com/investors-sec-we-better-n73014445306> [<https://perma.cc/FE2N-74GD>] (“Investors representing trillions of dollars around the world are asking the [SEC] to approach corporate reporting on environmental, social and governance (ESG) issues . . .”).

194. As noted above, some are already doing so. See *supra* notes 189-191.

195. Lydenberg et al., *supra* note 168, at 5-6 (observing that voluntary reporting regimes have made “valuable contributions” but ultimately concluding that a mandatory sustainability reporting framework is needed to overcome existing problems with ESG data).

196. Case, *supra* note 1, at 387 (calling for a “comprehensive system of mandatory reporting of environmental performance information”); Lydenberg et al., *supra* note 168, at 4 (“[W]ithout mandatory reporting, the crucial task of transforming sustainability reporting into actual improvements in sustainability performance will remain an especially difficult task.”).

197. For some of the first discussions of public goods, see Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS*, 609, 614-15 (NBER ed., 1962) (characterizing information as a public good); and Paul A. Samuelson, *The Pure Theory of Public Expenditure*, 36 REV. ECON. & STAT. 387, 387 (1954) (formalizing the definition of public goods). See also Case, *supra* note 1, at 440 (characterizing sustainability data as a public good).

information is nonrivalrous).¹⁹⁸ As a result, freeriding incentives can work to limit the production of publicly available information on corporate sustainability practices to below socially optimal levels.¹⁹⁹ Specifically, when a company releases sustainability data to the public, its shareholders benefit from new insights into the firm's management and operational processes.²⁰⁰ But those insights can also accrue to rival firms, who can exploit the once-proprietary information to their advantage.²⁰¹ Competitors, for example, might copy the disclosing firm's strategies for streamlining supply chains or its plans for investing in sustainability-driven growth areas.²⁰² Thus, because firms cannot capture all the benefits of sustainability information disclosures (i.e., it cannot easily charge other firms for using that information), economic theory predicts that the private sector will underproduce sustainability-related information if left to its own devices.²⁰³

Second, externalities caused by corporate greenwashing further reduce the incentives to disclose on sustainability metrics. When a company reports inaccurate information on its sustainability practices, it damages not only its own reputation but also the trustworthiness of sustainability metrics in general.²⁰⁴ These negative externalities result from information asymmetries between companies and shareholders. Because sustainability data often pertain to the internal workings of the firm, investors cannot easily ascertain the veracity of self-reported, voluntarily disclosed company data.²⁰⁵ Thus, investors cannot

198. See 3 HUGH GRAVELLE & RAY REES, *MICROECONOMICS* 326 (2004) (defining the properties of a public good); Joseph E. Stiglitz, *Economic Foundations of Intellectual Property Rights*, 57 *DUKE L.J.* 1693, 1699-1700 (2008) (describing knowledge as a public good).

199. See Kennedy et al., *supra* note 50, at 32 (describing the freeriding incentives in the production of new ideas); Zachary Liscow & Quentin Karpilow, *Innovation Snowballing and Climate Law*, 95 *WASH. U. L. REV.* 385, 395-96 (2017) (same).

200. For a discussion of how disclosure of sustainability information can induce internal and peer-to-peer learning, see *supra* notes 19-22 and accompanying text.

201. See Frank H. Easterbrook & Daniel R. Fischel, *Mandatory Disclosure and the Protection of Investors*, 70 *VA. L. REV.* 669, 686 (1984).

202. Indeed, new value-generating sustainability strategies can perhaps be best understood as a form of research and development (R&D). There exists a vast literature showing that the private sector underinvests in R&D because firms rarely capture the full benefits of their investments in innovative ideas and technologies. See Bronwyn H. Hall et al., *Measuring the Returns to R&D*, in 2 *HANDBOOK OF THE ECONOMICS OF INNOVATION* 1033-82 (Bronwyn H. Hall & Nathan Rosenberg eds., 2010) (reviewing the theoretical and empirical literature on R&D externalities).

203. See Case, *supra* note 1, at 441.

204. Karkkainen, *supra* note 1, at 290-91 ("In the absence of verifiable reporting standards and publicly accessible comparative performance data, some firms may exploit opportunities to provide the public with misleading (even if not overtly false) information. This could be done by overstating environmental accomplishments while selectively omitting or obscuring damaging and potentially undercutting incentives for even top environmental performers to self-report because such reports may be deemed unreliable by a skeptical public."). Notably, the capacious definition of sustainability creates ample opportunities for selective and misleading reporting. See Esty & Cort, *supra* note 14, at 15 (noting the lack of consensus on what sustainability means).

205. See Beatriz Cuadrado-Ballesteros et al., *Mitigating Information Asymmetry Through Sustainability Assurance: The Role of Accountants and Levels of Assurance*, 26 *INT'L BUS. REV.* 1141, 1141 (2017) (discussing how information asymmetries reduce the value of sustainability data to investors and firms alike); Chatterji et al., *supra* note 169, at 126 ("It can be difficult, however, for

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distinguish between accurate and inaccurate sustainability reporting. Discoveries of corporate greenwashing, therefore, can breed distrust in sustainability disclosure mechanisms as a whole.²⁰⁶ In turn, these dynamics reduce both the incentives to accurately report sustainability data and the market value of sustainability leadership, since companies that accurately report on their high sustainability performance might nonetheless be labeled as “greenwashers” due to the misreporting of others.²⁰⁷ In this way, the market for corporate sustainability becomes a market for lemons: because investors cannot differentiate sustainability leaders from sustainability imitators, markets will not reward sustainability leadership with a premium.²⁰⁸ Of course, third-party auditing and verification of sustainability reporting could mitigate some of these negative externalities by reducing the information asymmetries between companies and investors.²⁰⁹ That said, firms will only voluntarily pay for these external assurance services if the financial benefits that they will receive from an external audit and verification outweigh its costs. Given that these companies do not fully internalize the benefits of their sustainability disclosures in general,

stakeholders to evaluate companies’ environmental impacts.”); Sarah Elena Windolph, *Assessing Corporate Sustainability Through Ratings: Challenges and Their Causes*, 1 J. ENVTL. SUSTAINABILITY 37, 40 (2011) (“Consumers, investors, and other stakeholders are not able to verify the sustainability claims made by companies, because they do not have access to the relevant information. This not only affects products, but also processes inside companies and along supply chains.”).

206. See Karkkainen, *supra* note 1, at 290-91 (observing that “some firms may exploit opportunities to provide the public with misleading (even if not overtly false) information,” thereby “reducing the value of self-reported information generally”); William S. Laufer, *Social Accountability and Corporate Greenwashing*, 43 J. BUS. ETHICS 253, 255-258 (2003) (raising concerns about corporate greenwashing); Bailey et al., *supra* note 149, at 3 (underscoring investors’ need for “a kind of ‘greenwashing’ detector”); Lewis et al., *supra* note 14, at 36 (identifying concerns about greenwashing as a major barrier to sustainable investment integration); Serafeim & Grewal, *supra* note 126, at 11 (noting that ESG reporting has been undermined by concerns about “goodwashing”).

207. Case, *supra* note 1, at 395 (“Unquestionably, instances of disclosure of inaccurate or misleading information substantially reduce the value of self-reporting mechanisms generally. Public skepticism engendered by misleading or inaccurate reporting undercuts incentives for even superior environmental performers to voluntarily report due to concern that even accurate, reliably informative reporting will be viewed as nothing more than ‘green washing.’”). Indeed, in some instances, it might be in the best interest of sustainability laggards to artificially inflate their sustainability performance. If their cheating goes undiscovered, they can erase any stock advantages that accrue to sustainability leaders. On the other hand, if they are discovered, they can still reduce any stock premium associated with sustainability leadership by engendering investor distrust of sustainability reporting in general.

208. See generally George A. Akerlof, *The Market for “Lemons”: Quality Uncertainty and the Market Mechanism*, 84 Q.J. ECON. 488 (1970) (explaining how information asymmetries can cause low-quality products to drive high-quality products out of a market).

209. See Ryan J. Casey & Jonathan H. Grenier, *Understanding and Contributing to the Enigma of Corporate Social Responsibility (CSR) Assurance in the United States*, 32 AUDITING: J. PRACTICE & THEORY 97, 108 (2015) (“Assurance, by improving the information provided to users, further reduces information asymmetry.”); Iris H-Y Chiu, *Standardization in Corporate Social Responsibility Reporting and a Universalist Concept of CSR?—A Path Paved with Good Intentions*, 22 FLA. J. INT’L L. 361, 387 (2010) (“Information asymmetry between the corporation (essentially management) and others is at the root for the demand for assurance services . . .”); Ana Zorio et al., *Sustainability Development and the Quality of Assurance Reports: Empirical Evidence*, 22 BUS. STRATEGY & ENV’T 484, 486 (2013) (noting that “the importance of assurance comes from the need to mitigate information asymmetry with institutional creditors”).

it seems unlikely that voluntary third-party auditing and verification can raise sustainability reporting to socially optimal levels.²¹⁰

Third, this under-reporting problem is exacerbated by the comparative nature of sustainability metrics. Investors want sustainability data in order to rank companies in terms of their sustainability practices—i.e., to separate the leaders from the laggards.²¹¹ Firms therefore have a strategic incentive to avoid disclosing information that will make them look worse than their competitors.²¹² Thus, many scholars and investors worry that sustainability data produced through voluntary disclosure regimes will be biased due to selective reporting.²¹³ These concerns are not unfounded, as prior studies have shown a tendency among firms to emphasize positive sustainability information and downplay the negative aspects of their sustainability track record.²¹⁴

Of course, if investors interpret a firm's failure to disclose on a particular indicator as a signal for poor performance, it might mitigate the incentives to selectively disclose.²¹⁵ According to this so-called "signaling theory," firms will voluntarily disclose any and all good news that will make them more attractive to investors.²¹⁶ Markets, in turn, will equate no news with bad news—and penalize nondisclosures accordingly.²¹⁷ Fearing that markets will overpenalize them for missing data, firms will voluntarily disclose bad news, resulting eventually in the complete disclosure of all material information—good and bad.²¹⁸

210. Casey & Grenier, *supra* note 209, at 98 (attributing the relatively low demand for sustainability auditing and verification practices to their perceived costs); *Generating Value*, *supra* note 191, at 26 (2016) (noting the perception among some firms that costs of external assurance of sustainability reports outweighs its benefits).

211. *See supra* Section II.B.

212. *See* Easterbrook & Fischel, *supra* note 201, at 687; Stewart, *supra* note 6, at 139 (observing that "businesses rarely have a market incentive" to disclose negative information).

213. *See, e.g.*, Douglas, *supra* note 122, at 104 (discussing how voluntary reporting can lead to selective and biased ESG reporting); Lewis et al., *supra* note 14, at 36 (discussing investor concerns about greenwashing).

214. Rudiger Hahn & Regina Lulfs, *Legitimizing Negative Aspects in GRI-Oriented Sustainability Reporting: A Qualitative Analysis of Corporate Disclosure Strategies*, 123 J. BUS. ETHICS 401, 402 (2014) (reviewing this literature); Lois S. Mahoney et al., *A Research Note on Standalone Corporate Social Responsibility Reports: Signaling or Greenwashing?*, 24 CRITICAL PERSP. ACCT. 350, 357 (2013) (citing evidence of "companies with 'bad' social and environmental activities voluntarily releas[ing] their social and environmental activities in a positive light and fail[ing] to disclose negative environmental performance or disclos[ing] it in less detail to protect their self-interests").

215. *See* Easterbrook & Fischel, *supra* note 201, at 683 (explaining this signaling theory in detail). *See generally* Steven A. Ross, *Disclosure Regulation in Financial Markets: Implications of Modern Finance Theory and Signaling Theory*, in ISSUES IN FINANCIAL REGULATION (Franklin R. Edwards ed., 1979) (same). Notably, sustainability data providers can reinforce these signaling incentives by penalizing firms for failing to report on key metrics—e.g., by replacing missing data (nondisclosures) with lower-than-average scores. *See* Esty & Cort, *supra* note 14, at 37.

216. Merritt B. Fox et al., *Law, Share Price Accuracy, and Economic Performance: The New Evidence*, 102 MICH. L. REV. 331, 336 n.14 (2003).

217. *Id.*

218. Easterbrook & Fischel, *supra* note 201, at 683 ("Once the firm starts disclosing it cannot stop short of making any critical revelation, because investors always assume the worst. It must disclose the bad with the good, lest investors assume that the bad is even worse than it is."); Allen Ferrell,

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While the signaling theory might have some explanatory power in the context of corporate financial disclosures,²¹⁹ it is a particularly poor fit for corporate sustainability disclosures. To begin, nonresponses are, at best, a crude proxy for poor sustainability performance.²²⁰ As noted above, firms tend to under-report on sustainability metrics—both because they cannot capture the full benefits of their data disclosures and because the negative externalities of corporate greenwashing reduce the value of sustainability disclosures in general. In addition, some firms may fail to report good sustainability news simply because the costs of reporting outweigh the perceived benefits of publicizing this information.²²¹ As a result, no news should not be equated with bad news when it comes to sustainability. Instead, investors face the challenging task of determining *which* nonresponses are due to businesses strategically hiding their unsustainable practices and which have more benign causes.²²² This task is made all the more difficult by investors' general lack of familiarity with sustainability issues.²²³ To date, mainstream investors have struggled to interpret and utilize reported sustainability data; the interpretative challenges are even greater for missing sustainability data.²²⁴ Arguably then, the signaling theory's central

The Case for Mandatory Disclosure in Securities Regulation Around the World 9-10 (Harvard John M. Olin Ctr. for Law, Economics & Bus., Discussion Paper No. 492, 2004) (“Simply put, firms that wish to maximize the value of their shares will ensure that investors do not mistakenly assign a positive probability that the firm is withholding information that would reveal a low firm value and, hence, assign a low value to the firm’s shares. Eventually, the market completely unravels with all firms voluntarily disclosing any private information they have concerning firm value even if their firm value is low.”).

219. There is a robust debate over whether market forces alone can incentivize socially optimal levels of corporate financial information. Compare Roberta Romano, *The Need for Competition in International Securities Regulation*, 2 THEORETICAL INQUIRIES IN L. 387, 418 (2001) (“The signaling hypothesis regarding information disclosure is a plausible scenario in today’s capital markets in which the majority of investors are sophisticated institutional investors.”), with Merritt B. Fox, *Retaining Mandatory Securities Disclosure: Why Issuer Choice Is Not Investor Empowerment*, 85 VA. L. REV. 1335, 1361 (1999) (“While the signaling phenomenon means that the market will be better informed in a system of issuer choice than might first appear, it will not be as well informed as it would be if all issuers were compelled to disclose at the higher level that some issuers choose voluntarily.”).

220. Professor Merritt B. Fox makes a similar point when arguing in favor of securities regulations requiring disclosure of financial data to investors. He argues that “[s]ilence is not a complete substitute for affirmatively disclosing [information] because the market knows that an issuer could choose a low-disclosure regime for reasons other than a lack of good news.” He notes, in particular, that “an issuer may choose not to disclose because revealing the information might put it in an inferior position vis-à-vis a competitor, major supplier, or major customer.” Fox, *supra* note 219, at 1361.

221. Ioannis Ioannou & George Serafeim, *The Consequences of Mandatory Corporate Sustainability Reporting* 14 (Harvard Bus. Sch., Working Paper 11-100, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1799589 [<https://perma.cc/2CCH-5Z7D>] (“[S]ustainability disclosure regulations might decrease firm value by imposing significant preparation costs (e.g., environmental management systems for gathering environmental information) on firms.”); *Generating Value*, *supra* note 191, at 26 (observing that some firms believe that costs of external assurance of sustainability reports outweighs its benefits). Nondisclosures resulting from reporting costs may not matter from an efficiency standpoint. See Ferrell, *supra* note 218, at 10. However, as discussed below, economic efficiency is not necessarily the appropriate metric for measuring the desirability of a mandatory sustainability disclosure framework.

222. Easterbrook & Fischel, *supra* note 175, at 687-88 (discussing similar challenges when interpreting missing data on corporate finances); Fox, *supra* note 220, at 1361 (same).

223. See *supra* notes 149-153 and accompanying text.

224. See *supra* notes 183-188 and accompanying text.

assumption—that “a sufficient number of investors understand the significance of nondisclosure”²²⁵—is not met in the case of sustainability data.

In light of the above market failures, this Article suspects that voluntary disclosure regimes alone will not generate the types of comprehensive, standardized, and trustworthy sustainability metrics that mainstream investors can confidently incorporate into their portfolio management policies. Indeed, it is notable that, despite decades of experimentation in—and development of—voluntary sustainability reporting, investors are still frustrated with existing sustainability datasets.²²⁶ Environmental regulators should therefore follow in the footsteps of American financial regulators and mandate corporate disclosures on material sustainability issues.²²⁷ A mandatory reporting regime would significantly reduce the nonreporting and selective-reporting problems that currently plague sustainability metrics.²²⁸ It would also lower costs over time as standard forms and guidance become widespread. And as discussed in the following Section, carefully designed regulations can also enhance investor confidence in sustainability reporting by developing robust methodological standards that facilitate comparability across material sustainability issues.

Before moving to these additional design considerations, however, it is worth briefly noting this Article’s relationship to the voluminous literature on mandatory financial reporting requirements. Since the passage of the Securities Act of 1933 and the Securities Exchange Act of 1934, legal scholars and economists have debated the effectiveness and desirability of a federal mandatory disclosure regime for public company securities.²²⁹ Some maintain that mandatory disclosure reduces information asymmetries between firms and shareholders, boosts corporate reporting of financial data, increases investor confidence in capital markets, and enhances the nation’s economic efficiency.²³⁰ Others, however, question the extent to which market forces underproduce

225. Romano, *supra* note 219, at 418; *see also* Roberta Romano, *Empowering Investors: A Market Approach to Securities Regulation*, 107 YALE L.J. 2359, 2367 (1998).

226. *See* Case, *supra* note 1, at 388-91 (tracing the history of voluntary corporate sustainability reporting). For a discussion of the problems with current sustainability metrics, *see* Section II.B of this Article.

227. *See id.* at 387 (arriving at a similar conclusion).

228. Lydenberg et al., *supra* note 168, at 5 (arguing that mandatory ESG reporting would address many of the problems with existing ESG data, including lack of data comparability and selective reporting).

229. Joel Seligman, *The Historical Need for a Mandatory Corporate Disclosure System*, 9 J. CORP. L. 1, 1-2 (1983). The debate rapidly escalated in the 1960s, when financial economists began arguing that disclosure was not required to protect ordinary investors from buying unfairly priced stock. *See* Fox, *supra* note 216, at 335-36.

230. *See, e.g.*, Fox, *supra* note 216, at 334 (providing empirical evidence that mandatory disclosures rules increase share price accuracy); Fox, *supra* note 219, at 1338 (“This Article argues that, despite these apparent attractions, we should reject issuer choice and retain the current mandatory system.”); Zohar Goshen & Gideon Parchomovsky, *The Essential Role of Securities Regulation*, 55 DUKE L.J. 711, 711-12 (2006) (arguing for the efficiency of a mandatory disclosure regime for securities on the grounds that it reduces search costs and information verification costs); Seligman, *supra* note 229, at 9 (explaining the historical rationale for the SEC’s mandatory corporate disclosure system).

corporate financial information.²³¹ And even assuming that voluntary disclosures result in sub-optimal levels of information, these critics challenge the effectiveness of federal mandatory disclosure regulations, arguing that these requirements either do not raise social welfare (once the costs of regulation are taken into account) or are less efficient than other regulatory regimes (e.g., state disclosure regulations).²³²

This Article does not take a position on these debates. The issues that are most contentious in the literature on mandatory *financial* reporting are less central to evaluating the desirability of mandatory *sustainability* reporting. In particular, scholars have reasonably disagreed over whether markets underproduce financial information as an empirical matter.²³³ By contrast, there is clear evidence of a sustainability information shortage. As discussed above, response rates for today's voluntary sustainability disclosure regimes are strikingly low; mainstream investors have expressed widespread frustration with the coverage of existing sustainability metrics; and market analysts agree that these data gaps have significantly impeded the growth of sustainable investing.²³⁴ At the same time, empirical evidence from the TRI program—as well as from other mandatory disclosure programs enacted in other countries²³⁵—strongly suggests that companies do not voluntarily disclose all financially material sustainability information. If they did, stock market prices should not have declined in response to TRI disclosures.²³⁶

More importantly though, the goals of mandatory sustainability reporting differ from those of mandatory financial reporting. While improving the efficiency of capital markets is often viewed as the central justification of financial securities regulation,²³⁷ sustainability information regulation aims to

231. See, e.g., Roberta Romano, *Empowering Investors: A Market Approach to Securities Regulation*, 107 YALE L.J. 2359, 2373-81 (1998); Jonathan Macey, *Administrative Agency Obsolescence and Interest Group Formation: A Case Study of the SEC at Sixty*, 15 CARDOZO L. REV. 909, 928 (1994).

232. See, e.g., Romano, *supra* note 225, at 2361-62 (arguing for a state-centered system of securities regulation); Romano, *supra* note 219, at 439 (arguing that supporters of mandatory disclosure regimes have committed “the grass is always greener fallacy” by “assum[ing] that the government alternative achieves the optimal output without examining that government alternative as closely as they scrutinize market outcomes”).

233. Compare Romano, *supra* note 225, at 2373 (concluding based on a review of the empirical literature that “[t]here is little tangible proof of the claim that corporate information is ‘underproduced’ in the absence of mandatory disclosure, or that the benefits to investors from information that firms would not produce in the absence of mandatory disclosure actually outweigh their costs”), with Fox, *supra* note 219, at 1379 (coming to the opposite conclusion).

234. See *supra* notes 178-182 and accompanying text.

235. See Ioannou & Serafeim, *supra* note 221, at 8 (providing empirical evidence that the adoption of mandatory sustainability reporting requirements increased levels of ESG information disclosed by companies in China, Denmark, Malaysia, and South Africa).

236. See *supra* notes 32-37 & 54-61 and accompanying text.

237. Fox, *supra* note 216, at 336 (describing a shift in scholarly attention “from the effects of mandatory disclosure on fairness to its effects on economic efficiency”); Michael D. Guttentag, *An Argument for Imposing Disclosure Requirements on Public Companies*, 32 FLA. ST. U. L. REV. 123,

further ESG policy objectives by harnessing untapped investor interest in sustainability. This Article’s definition of success therefore encompasses disclosure requirements that shift capital away from unsustainable firms and toward sustainable ones, even if they do not necessarily improve—or perhaps even reduce—the efficiency of stock prices. Of course, this Article is mindful of the reporting costs imposed on firms by mandatory disclosure regimes, which it argues can be minimized through carefully designed disclosure requirements.²³⁸ However, in weighing the costs and benefits of a mandatory sustainability reporting regime, Section III.C of this Article adopts a more expansive view of welfare that goes beyond capital market efficiency to include the many environmental externalities that are not currently being priced into today’s markets.

B. Core Design Considerations

Mandatory disclosure is, of course, only one component of an effective sustainability reporting regime for mainstream investors. To fully harness investor interest in sustainability, a new model of information regulation is needed to elicit the right types of information that are material to mainstream investors. This Section outlines several key considerations for guiding the development of such a mandatory sustainability reporting regime.

First, such efforts should focus on developing a menu of sustainability metrics that allow investors to tailor their sustainability interests to their investment goals.²³⁹ As noted earlier, mainstream investors vary greatly in terms of their sustainability and financial objectives.²⁴⁰ The mandatory sustainability reporting regime should account for this heterogeneity in preferences by offering a range of metrics that measure different dimensions of sustainability. Limits should be placed, however, on the number of sustainability metrics that any given firm must report on, as an overly expansive set of mandatory reporting requirements will be costly for firms and confusing for investors.²⁴¹

126 (2004) (identifying efficiency as the main rationale for federal disclosure requirements on public companies).

238. For a more detailed discussion of this point, see *infra* Section III.C.

239. See Esty & Cort, *supra* note 14, at 41.

240. See *supra* Section II.B.

241. For example, the Global Reporting Initiative (GRI)—a well-known voluntary sustainability reporting framework—asks companies to assess their performance on up to fifty-eight “General Standard Disclosures,” eighty-two “Specific Standard Disclosures,” and a variety of additional disclosures listed in ten “Sector Supplements.” As Professors Esty and Cort note: “The exhaustiveness of [the GRI’s] reporting framework has been seen as excessively burdensome by many companies and in tension with GRI’s stated goal of highlighting the most *material* issues.” Esty & Cort, *supra* note 14, at 33; see also Douglas, *supra* note 122, at 102 (finding that top ESG data providers track hundreds of sustainability indicators); Alnoor Ebrahim & V. Kasturi Rangan, *What Impact?: A Framework for Measuring the Scale and Scope of Social Performance*, 56 CAL. MGMT. REV. 118, 122 (2014) (arguing, in the context of philanthropic funding, that an overload of impact and outcome measurements “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”); Roca & Searcy,

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To balance these competing interests, this Article recommends a reporting structure with three tiers of sustainability metrics, namely: (1) core indicators, (2) industry-specific indicators, and (3) governance indicators. The first tier of core indicators would cover a small set (no more than ten to fifteen) of material sustainability issues that are shared by all industries. Thus, these core indicators have two defining features. First, they are tightly focused on sustainability factors that have strong, direct impacts on financial performance—both long term and short term. And second, they only include sustainability issues that are common to businesses across different industries. Greenhouse gas emissions and energy efficiency, for example, would likely qualify as common core issues, as nearly all companies have an energy and carbon footprint that exposes them to policy and market shifts toward decarbonization.²⁴² Core indicators therefore allow mainstream investors to make broad comparisons across industries on sustainability issues that strongly correlate with business fundamentals.

By contrast, the second tier of industry-specific indicators would track those sustainability dimensions deemed most material to businesses within each industry.²⁴³ As others have noted, the materiality of many sustainability issues varies substantially across sectors of the economy.²⁴⁴ A case in point: toxic waste is likely a material indicator for the electronics industry but not for financial services. Thus, a reporting regime that focused only on sustainability issues shared by all industries would miss this important variation. Instead, investors need a second tier of industry-specific indicators that drill down on the most pressing sustainability challenges facing different segments of the economy and that are detailed enough to sort sustainability leaders from laggards *within* each industry. As with core indicators, the selection of industry-specific metrics should be guided by the principles of materiality. Done correctly, then, second-

supra note 173, at 103 (finding nearly six hundred different sustainability indicators among just ninety-four corporate sustainability reports); Lois Guthrie, *Mapping the Sustainability Reporting Landscape: Lost in the Right Direction*, CLIMATE DISCLOSURE STANDARDS BD. 26 (May 2016), https://www.cdsb.net/sites/default/files/acca_cdsb_mapping_the_sustainability_landscape_lost_in_the_right_direction.pdf [<https://perma.cc/F76E-4THW>] (describing how fragmented sustainability reporting regimes lead to duplicative reporting by companies, uncertainty about what should be reported, and a cluttered landscape of sustainability information that sows confusion among investors and companies alike).

242. However, as noted earlier, corporate reporting on greenhouse gas emissions is currently far from ubiquitous. Only about two percent of companies worldwide report global warming emissions to the Carbon Disclosure Project, the most widely used corporate disclosure program for carbon emissions. *See supra* note 179 and accompanying text. This reality reiterates the importance of a *mandatory* reporting regime to overcome under-reporting on material sustainability issues.

243. *See* Mozaffar N. Khan et al., *supra* note 145, at 2 (observing that the materiality of sustainability issues will likely vary by industry); Usman Hayat & Matt Orsagh, *Environmental, Social, and Governance Issues in Investing*, CFA INST. 13 (2015), <https://www.cfainstitute.org/-/media/documents/article/position-paper/esg-issues-in-investing-a-guide-for-investment-professionals.ashx> [<https://perma.cc/TV9F-M2WW>] (same).

244. *E.g.*, Satyajit Bose & Amy Springsteel, *The Value and Current Limitations of ESG Data for the Security Selector*, 8 J. ENVTL. INV. 56, 64 (2017) (“Materiality is industry-specific. What is an important operational requirement or reputational issue to one company may not be to another in a different industry.”); Lydenberg et al., *supra* note 168, at 12 (discussing the importance of industry-specific ESG metrics).

tier metrics should create a tailored portrait of the sustainability obstacles and opportunities that are most likely to impact the financial trajectory of companies in a given industry.

Finally, the third tier of governance indicators would apply to all industries and would focus on a company's institutional capacity to respond to sustainability pressures and opportunities. Such indicators might cover, for example, the degree to which the company's board oversees and addresses sustainability issues; whether the company has established procedures for monitoring sustainability risks in its supply and value chains; whether the firm has a centralized team dedicated to developing best practices for sustainability management; and whether the company has mechanisms for systematically integrating sustainability considerations into investment and business strategy decisions, such as an internal price on carbon. Governance indicators, however, should not be limited solely to measuring institutional investments in sustainability management. A company's responsiveness to present and future sustainability pressures also depends on the quality of its governance and management practices more generally. Thus, this third-tier of governance indicators should also track a company's workforce training investments, human resource management practices, and allocation of responsibilities between officers and the board. These general measures of corporate institutional health may not be directly linked to financial growth in the short or medium run, as is the case with many *core* sustainability issues.²⁴⁵ However, they are critical to the long-run health of a company and, if mismanaged, these types of governance issues can devastate a firm, as illustrated by Uber's recent string of corporate management fiascos.²⁴⁶ Ultimately, by measuring both a company's governance structures around sustainability and a company's governance practices more generally, the third tier of governance indicators would provide mainstream investors with much-needed insights into a company's ability to ride the sustainability wave of the future.

Notwithstanding these differences, materiality should be the central principle guiding the development of indicators at all three tiers of the proposed reporting structure. Materiality, in turn, should be defined with the mainstream investor in mind—recognizing that many sustainability-minded investors want to get a line of sight on issues, such as climate change, that may not be financially

245. As this Article has discussed, companies can build profitable new business strategies and product lines around core sustainability issues, a prime example being the auto industry's recent shifts toward electric and hybrid vehicles in response to the core sustainability issue of climate change. See, e.g., Jack Perkowski, *The Auto Industry Can't Ignore the Electric Vehicle Revolution Any Longer*, FORBES (Sept. 7, 2017), <https://www.forbes.com/sites/jackperkowski/2017/09/07/how-electric-vehicles-are-changing-the-auto-landscape> [<https://perma.cc/H9K3-YW2H>]. By contrast, it is difficult to envision a new business strategy or product line arising from innovations in corporate governance or human resource management, even though both are critical to firm performance.

246. See generally John Boudreau, *Uber Is Finally Realizing HR Isn't Just for Recruiting*, HARV. BUS. REV. (Mar. 8, 2017), <https://hbr.org/2017/03/uber-is-finally-realizing-hr-isnt-just-for-recruiting> [<https://perma.cc/DL9C-CQBV>] (documenting how Uber's human resource management practices have created a crisis for the company).

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material in the short term (especially where policies to control greenhouse gas emissions are being withdrawn) but are likely to affect marketplace performance over time.²⁴⁷ To the extent possible, metrics should focus on those dimensions of sustainability with strong empirical or theoretical links to corporate financial performance.²⁴⁸ In addition, the menu of sustainability metrics as a whole should enable investors to distinguish sustainability leaders from laggards. In other words, they should cater to the preferred investing strategies of mainstream shareholders by providing a set of sustainability red and green lights that can redirect capital away from laggards and toward leaders. Of course, it will not always be clear which dimensions of sustainability are most material to the financial performance of a firm.²⁴⁹ But regulators can partially mitigate this concern by developing metrics that focus on future operational performance, rather than past reputation.

Policymakers should be careful, however, to not adopt too narrow a definition of materiality. Some sustainability issues may have direct, short-term impacts on financial performance, such as reducing toxic-waste output²⁵⁰ or improving supply-chain efficiency.²⁵¹ Many others, however, will have indirect, longer-term effects on firm value, and these factors have traditionally been ignored by the financial markets' focus on short-term profits.²⁵² By design, some of these long-term value creators will be captured by the third-tier of governance sustainability variables. But to create a truly effective sustainability reporting regime, core and industry-specific sustainability metrics must also be broad

247. See Douglas, *supra* note 122, at 103 (observing that “[i]nvestor concern that neither GRI nor IIRC provided sufficient focus on material ESG factors that most interest investors led to a new reporting standard developed by the Sustainability Accounting Standards Board (SASB)”).

248. For a discussion of mainstream investors' preference for sustainability factors that correlate with financial performance, see *supra* notes 135-148 and accompanying text.

249. See *supra* Section II.A.

250. As discussed above in Sections I.A and I.B, markets quickly responded to disclosures of toxic waste under the TRI program.

251. See Porter & Kramer, *supra* note 66, at 9 (discussing how value creation can arise through the careful streamlining of supply chains).

252. See Clark et al., *supra* note 12, at 11 (“One reason for this imbalance between acknowledging the importance of sustainability and acting on it is pressure from the financial markets’ focus on short-termism.”); Lewis et al., *supra* note 14, at 3 (“A focus on short-term performance frequently leads investors to overlook material ESG issues that can play out over time.”); Orlitzky, *supra* note 4, at 8 (“Probably the most direct explanation of a positive effect of CC [corporate citizenship] on CFP [corporate financial performance] is the view of CC as a revenue generator—especially in the long run.”). Indeed, it is generally understood that investments in sustainability often pay off in the medium- and long-run. See Bonini & Bové, *supra* note 77, at 3 (noting the tension between “short-term earnings pressure” and “the longer-term nature of these [sustainability] issues”); Endrikat, *supra* note 85, at 740 (observing that “long-term effects . . . are likely to be involved in the CEP-CFP [corporate environmental performance-corporate financial performance] link”); *Exploring ESG*, *supra* note 155, at 1 (discussing how “ESG factors contribute to long-term value”); Fulton et al., *supra* note 143, at 29 (highlighting “the relatively long-term nature of E, S and G factors”); Lewis et al., *supra* note 14, at 33 (“To plan for ESG risks, companies must make large capital investments that do not necessarily generate returns in the immediate term.”).

enough to track sustainability's potential for *long-term* value creation.²⁵³ The tricky question, of course, is determining how broad is "broad enough." Non-government data providers have struggled with this problem over the years, often leading to divergent outcomes. The Sustainability Accountability Standards Board (SASB), for example, has adopted a narrow definition of materiality that has resulted in just two to ten sustainability metrics per industry.²⁵⁴ In contrast, the GRI's expanded view of materiality has produced a reporting framework that asks companies to assess up to fifty-eight "General Standard Disclosures," eighty-two "Specific Standard Disclosures," and various other "Sector Supplement Disclosures."²⁵⁵ We suspect that the optimal number of metrics lies somewhere in between the SASB's number and the GRI's. Further, we believe that our proposed three-tiered reporting regime will help policymakers strike the right balance. On the one hand, the regime's dedicated focus on materiality, as understood by the mainstream investor, works to limit the number of sustainability indicators included in the reporting framework. On the other hand, the regulation's three tiers of metrics—core, industry-specific, and governance—work to create tailored, multilayered portraits of the sustainability challenges and opportunities facing each industry.

For initial guidance on this three-tiered reporting structure, policymakers can look to the disclosure framework developed by the Task Force on Climate-Related Financial Disclosures (TCFD).²⁵⁶ Chaired by Michael Bloomberg, the TCFD recently released a voluntary disclosure framework for companies to report climate-related information in their financial filings.²⁵⁷ Materiality is the guiding force behind this framework, which the TCFD expressly designed to address the informational needs of mainstream investors, lenders, insurers, and

253. See Lydenberg et al., *supra* note 168, at 20 (proposing a definition of ESG materiality that "is broader in scope than the definitions of materiality historically used by financial regulatory parties"); Marcy Murningham & Ted Grant, *Redefining Materiality II: Why It Matters, Who's Involved, and What It Means for Corporate Leaders and Boards*, ACCOUNTABILITY 2 (Aug. 2013), <https://www.accountability.org/wp-content/uploads/2017/02/Redefining-Materiality-2.pdf> [<https://perma.cc/NT23-RCUW>] (calling for an expanded definition of materiality that accounts for the risks, opportunities, and longer time horizons of sustainability issues); *Implementing the Recommendations of the Task Force on Climate-Related Financial Disclosures*, TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURE 1 (June 2017), <https://www.fsb-tcfid.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf> [<https://perma.cc/GQH4-VK9T>] [hereinafter *Implementing the TCFD Recommendations*] (cautioning "against prematurely concluding that climate-related risks and opportunities are not material based on perceptions of the longer-term nature of some climate-related risks").

254. See *SASB Materiality Map*, SUSTAINABILITY ACCOUNTING STANDARDS BD., <https://materiality.sasb.org/?hsCtaTracking=28ae6e2d-2004-4a52-887f-819b72e9f70a%7C160e7227-a2ed-4f28-af33-dff50a769cf4> [<https://perma.cc/54Q4-HWLG>] (containing an interactive table listing industry-specific sustainability performance metrics).

255. See Esty & Cort, *supra* note 14, at 32-33.

256. See *generally About the Task Force*, TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, <https://www.fsb-tcfid.org/about/#> [<https://perma.cc/D8AA-C9MD>] (describing the TCFD).

257. *Implementing the TCFD Recommendations*, *supra* note 253, at 1 (discussing the TCFD's history).

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other market stakeholders.²⁵⁸ As such, the TCFD aims to solicit “decision-useful, forward-looking information on financial impacts” arising from both the risks and opportunities presented by global warming.²⁵⁹ Toward that end, the TCFD organizes its disclosures around four core elements, namely: (1) governance, (2) strategy, (3) risk management, and (4) metrics and targets.²⁶⁰ Under the first element, companies disclose information relating to the board and management’s roles in overseeing, assessing, and addressing climate-related risks and opportunities.²⁶¹ Thus, the governance element of the disclosure regime seeks to measure the level of attention that corporate leadership dedicates to climate issues. In contrast, the strategy element elicits information that will allow investors to catalogue the climate-related risks and opportunities facing each company.²⁶² For instance, the TCFD recommends that all companies describe in their disclosures any business risks or opportunities posed by climate change over the short-, medium-, and long-term time horizon.²⁶³ It further urges companies to consider how climate change will impact their products, services, supply chains, and operations, as well as how they might adapt their business models to a warmer world with stricter climate regulations.²⁶⁴ Next, under the risk management element, companies are encouraged to describe the internal programs and procedures that they have in place for identifying and managing climate-related risks.²⁶⁵ Thus, these risk-management disclosures focus on the company’s ability and readiness to respond to, and get ahead of, the downsides of climate change. Finally, the TCFD recommends that companies disclose (1) all climate-related targets that they have set for themselves (e.g., targets for reducing emissions, water use, and energy) and (2) any performance metrics that they are using to track their progress toward those targets.²⁶⁶

While the TCFD encourages all companies to report on these four core elements, it also recognizes that the materiality of climate change varies by sector.²⁶⁷ It therefore provides supplemental guidelines for industries that face unique climate change challenges and risks, including those in the energy,

258. See *Recommendations of the Task Force on Climate-Related Financial Disclosures*, TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, at iii (2017), <https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-2017-TCFD-Report-11052018.pdf> [<https://perma.cc/KM8T-WSCJ>] (“The Task Force was asked to develop voluntary, consistent climate-related financial disclosures that would be useful to investors, lenders, and insurance underwriters in understanding material risks.”).

259. *Id.* at iii.

260. See *Implementing the TCFD Recommendations*, *supra* note 253, at 11-12.

261. *Id.* at 14.

262. *Id.* at 15-16.

263. *Id.*

264. *Id.*

265. *Id.* at 16-17.

266. *Id.* at 17-18.

267. *Id.* at 4 (“While climate change affects nearly all economic sectors, the level of exposure and the impact of climate-related risks differ by sector, industry, geography, and organization.”).

transportation, materials and buildings, and agriculture sectors.²⁶⁸ For example, this second tier of guidance drills down on the energy sector's exposure to the financial risks and opportunities that could arise if changes in climate policy or market demand caused a structural shift toward a low-carbon energy system.²⁶⁹ In contrast, TCFD's industry-specific guidance for the agriculture sector focuses mainly on water use, land management, and changing weather patterns.²⁷⁰ Thus, by creating this two-tiered guidance structure, the TCFD encourages cross-industry comparisons of common climate change issues, while at the same time providing capital markets with "a fuller picture of potential climate-related financial impacts" in particularly affected industries.²⁷¹

We believe that the TCFD provides a strong starting point for developing the type of reporting regime that can effectively harness mainstream investor interest in sustainability. Its four core elements of disclosure seek to elicit financially material information by focusing on how climate change intersects with a company's current and future sales, operations, and business models. At the same time, its guidelines promote the disclosure of forward-looking climate performance metrics and encourage climate change planning across the short-, mid-, and long-term time horizons. This disclosure framework further invites companies to view climate change leadership as not only a risk mitigation strategy, but also a revenue growth strategy. If fully adopted and correctly implemented, this disclosure framework could greatly enhance investors' understanding of both the climate-related business challenges facing today's companies and the actions that each company is taking to prepare for a world with warming temperatures and, in all likelihood, stricter climate regulations.

The TCFD will not, however, fully satisfy the information needs of mainstream investors for at least two reasons. First, it is too narrowly focused on climate change. The investor community, by contrast, wants ESG data on a broader set of sustainability issues. Second, while the TCFD articulates a two-tiered structure of common and industry-specific disclosures, it neither specifies the metrics that companies should use to make these disclosures nor establishes uniform methodologies to ensure comparability between companies' climate-related metrics.²⁷² Instead, it only provides broad guidance on the types of climate information that should be disclosed, leaving the actual definition and operationalization of climate performance indicators to the discretion of the companies themselves.²⁷³ Thus, for example, it is up to the companies to decide

268. *Id.* at 2 (identifying as particularly impacted industries energy; transportation; materials and buildings; and agriculture, food, and forest products).

269. *Id.* at 52.

270. *Id.* at 62.

271. *Id.* at 4.

272. *Id.* at 17-20 (providing guidance on climate change metrics and targets and directing companies to select metrics from an array of existing climate disclosure indicators, including GRI, CDP, and CDSB).

273. *Id.*

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whether their climate targets should be defined on an absolute basis (e.g., tons of carbon emissions) or an intensity basis (e.g., emissions per product), the time frames over which each target applies, and the base year from which progress toward a target is measured.²⁷⁴ Furthermore, the TCFD permits companies to determine which climate-related issues are most material to them—that is, to pick and choose what their climate-related metrics measure.²⁷⁵ As a result, one consumer goods company might disclose water consumption at its factories. Another might report water consumption across its entire supply chain, and still another might not even include measures of water use, deeming the risk of future water shortages to be immaterial to its business model. This flexible, deferential approach toward ESG reporting is understandable, given that the TCFD is a voluntary framework that can advise, but not compel, corporate disclosures. However, as this Article has repeatedly stressed, a key shortcoming of existing sustainability metrics is their lack of completeness and comparability.

It is therefore critical that the proposed mandatory disclosure regime limits company discretion over sustainability reporting by clearly defining and specifying indicators for all three tiers of sustainability metrics. Toward that end, regulators should create a uniform set of methodological standards for sustainability reporting and metrics development. For guidance, regulators can look to existing methodological standards on finance, such as those produced by FASB, the International Monetary Fund, or the Bank of England.²⁷⁶ In line with investor surveys, regulators should implement procedures for normalizing sustainability data, so investors can make meaningful comparisons across companies in an industry.²⁷⁷ For example, firms that outsource production need to be held accountable for the environmental impacts of their supply chains to ensure an apples-to-apples comparison with vertically integrated firms.²⁷⁸ The standards should also require third-party verification and assurance of self-reported data in order to alleviate concerns about greenwashing.²⁷⁹ To maximize

274. *Id.* at 18.

275. *Id.*

276. See Esty & Cort, *supra* note 14, at 40 (stating that among other things, these finance methodological standards provide “procedures for statistical analysis; processes for data management; strategies for avoiding data collection problems; guidelines for the use of proxy metrics, data aggregation, and weighting; and protocols for the normalization of divergent metrics and reporting”).

277. See *supra* note 186 and accompanying text. For guidance on normalization, policymakers can look to MSCI’s ESG Ratings, which normalize company scores by industry. See Ezeokoli et al., *supra* note 122, at B-13.

278. Indeed, for a variety of industries, Scope 3 emissions—which include those arising from a company’s supply chain—account for the majority of a company’s carbon footprint. See Christian Blanco et al., *The State of Supply Chain Carbon Footprinting: Analysis of CDP Disclosures by US Firms*, 135 J. CLEANER PRODUCTION 1189, 1189 (2016).

279. See Casey & Grenier, *supra* note 209, at 97-98 (reviewing theoretical and empirical evidence suggesting that corporate social responsibility assurance can increase the value of sustainability disclosure); Gary F. Peters & Andrea M. Romi, *The Association Between Sustainability Governance Characteristics and the Assurance of Corporate Sustainability Reports*, 34 AUDITING: J. PRAC. & THEORY 163, 164 (2015) (underscoring the potential benefits of sustainability assurance “[i]n a time when sustainability reporting is increasingly criticized for its lack of transparency”); Danny Visscher,

investor confidence, regulators should make transparent any assumptions underlying the sustainability data, such as gap-filling procedures for missing data.

It will undoubtedly be challenging to develop a robust set of material sustainability metrics and their underlying methodologies. Regulators, however, will not be starting from scratch. Over the past decade, leading nongovernmental data providers have amassed a wealth of knowledge about the design and effectiveness of sustainability metrics and reporting.²⁸⁰ For example, both the Climate Disclosure Standards Board and the TCFD have developed rigorous methodological standards for reporting climate-related data that are materially relevant to corporate financial performance.²⁸¹ Meanwhile, the SASB has created a framework for integrating sustainability data into existing internal financial data controls and procedures—efforts that could significantly improve the comparability of sustainability metrics across companies.²⁸² Regulators can therefore significantly reduce the costs and challenges of implementing a mandatory sustainability reporting regime by collaborating with investors, firms, and NGOs in the field. Indeed, nongovernmental organizations have, in many respects, already done much of the heavy intellectual lifting. We therefore expect that regulators will work primarily to collate, synthesize, streamline, and standardize best practices on sustainability reporting into a unified mandatory reporting framework.

In the United States, the Securities Exchange Commission (SEC) is a natural home for such regulatory efforts.²⁸³ The agency could, for example, require mandatory disclosure of sustainability information through its 10-K

Determinates of External Assurance of Sustainability Reporting: A European Analysis 8 (July 4, 2016) (unpublished Ph.D. dissertation, Radboud University), https://theses.ubn.ru.nl/bitstream/handle/123456789/1774/Visscher%2C_Danny_1.pdf [<https://perma.cc/D3WX-F7VY>] (“External assurance is particularly important for positive information . . . Leaving positive information unassured can be perceived as greenwashing.”); *The External Assurance of Sustainability Reporting*, GLOB. REPORTING INITIATIVE 6 (2013), <https://www.globalreporting.org/resource/library/gri-assurance.pdf> [<https://perma.cc/XL36-BYV2>] (explaining how external assurance can increase “recognition, trust and credibility” of sustainability data).

280. Lead data providers include: Bloomberg, MSCI, Thomson Reuters, Arabesque, Oekom, Sustainalytics, and CDP—among others. See Douglas, *supra* note 122, at 96 (analyzing seventeen top ESG data providers, as identified by SustainAbility’s *Rate the Raters* report).

281. See generally *Implementing the TCFD Recommendations*, *supra* note 253 (describing recommended climate-related financial disclosures).

282. See Esty & Cort, *supra* note 14, at 41 (describing these efforts).

283. See Cynthia A. Williams, *The Securities and Exchange Commission and Corporate Social Transparency*, 112, HARV. L. REV. 1197, 1199 (1999) (arguing that the SEC has authority under the Securities Exchange Act of 1934 to require disclosure of material environmental and social issues); Linda M. Lowson, *Global Climate Change and Sustainability Financial Reporting: An Unstoppable Force with or Without Trump*, HARV. L. SCH. F. ON CORP. GOVERNANCE & FIN. REG. (Apr. 30, 2017), <https://corpgov.law.harvard.edu/2017/04/30/global-climate-change-and-sustainability-financial-reporting-an-unstoppable-force-with-or-without-trump> [<https://perma.cc/WN8A-C4WL>] (calling on the SEC to develop a disclosure regime for climate-related risks). But see Case, *supra* note 1, at 410 (arguing that “the SEC is not the appropriate agency” for developing new environmental information regulation because of the agency’s “troubled record on enforcing existing environmental disclosure requirements”).

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requirements.²⁸⁴ Indeed, the SEC has already issued detailed guidance on the disclosure of climate-related information under Regulation S-K.²⁸⁵ Furthermore, a group of investors representing more than \$1 trillion in assets under management recently urged the agency to require stronger reporting requirements for a range of sustainability issues.²⁸⁶

That said, the SEC is not the only regulatory body capable of spearheading a mandatory disclosure regime in the United States. Indeed, it may not even be the ideal choice, given the federal government's current antipathy toward action against climate change, environmental regulation, and sustainability more generally.²⁸⁷ Stock exchanges, for example, could incorporate a mandatory disclosure regime on sustainability into their listing requirements.²⁸⁸ Notably, nearly sixty stock exchanges—listing over thirty thousand companies and holding a market capitalization of more than \$55 trillion²⁸⁹—have already signed onto the Sustainability Stock Exchanges (SSE) Initiative, a UN-led “peer-to-peer” platform that explores how exchanges can promote sustainable investing.²⁹⁰ With the expansion of this network of sustainability-minded stock markets, many exchanges have begun taking concrete steps to facilitate sustainability disclosures among listed companies, including providing sustainability-themed indices, communicating with stakeholders about sustainability problems, and creating formal guidance for issuers on reporting

284. Esty & Cort, *supra* note 14, at 40-41.

285. See SEC, RELEASE NOS. 33-9106, 34-61469, FR-82, COMMISSION GUIDANCE REGARDING DISCLOSURE RELATED TO CLIMATE CHANGE (2010). For an overview of this guidance, see GARY SHORTER, CONG. RESEARCH SERV., R42544, SEC CLIMATE CHANGE DISCLOSURE GUIDANCE: AN OVERVIEW AND CONGRESSIONAL CONCERNS 1-2 (2013).

286. Letter from Ceres to Mary Jo White, Chair, SEC 1 (July 20, 2016), <https://www.ceres.org/sites/default/files/Fact%20Sheets%20or%20misc%20files/Ceres%20Investor%20Letter%20SEC%20Concept%20Release%207-20-16.pdf> [<https://perma.cc/2C38-CQKY>] (calling for “the SEC to improve reporting of material sustainability risks in issuers’ SEC filings”).

287. But see Matthew E. Kahn, *Requiring Companies to Disclose Climate Risks Helps Everyone*, HARV. BUS. REV. 2 (Feb. 16, 2017), <https://hbr.org/2017/02/requiring-companies-to-disclose-climate-risks-helps-everyone> [<https://perma.cc/8BGR-VY8T>] (noting that Jay Clayton has “advised clients to disclose climate-related risks,” but also suggesting that “the administration’s general deregulatory bent and refusal to recognize the existence of climate change [throws into question] the fate of the [SEC’s] climate disclosure [policy]”); Francine McKenna, *Trump’s SEC Pick Pushed Clients to Say More About Climate-Change Risks*, MARKETWATCH (Jan. 5, 2017), <https://www.marketwatch.com/story/trumps-sec-pick-pushed-clients-to-say-more-about-climate-change-risks-2017-01-05> [<https://perma.cc/X7Z4-2WXC>] (suggesting that Jay Clayton, President Trump’s choice for SEC chair, has previously encouraged clients to engage in climate-related disclosures).

288. That is, they would make disclosure of sustainability information a prerequisite for participation in the exchange. See Lydenberg et al., *supra* note 168, at 7 (discussing this option); see also UNEP, *Stock Exchanges and Sustainability* 5 (UNEP Inquiry Working Paper 15/13, 2015) (arguing that stock exchanges are “attractive targets as sustainability change agents”).

289. Chesebrough et al., *supra* note 155, at 17.

290. See *About the Sustainable Stock Exchanges (SSE) Initiative*, SUSTAINABLE STOCK EXCHANGES INITIATIVE, <http://www.sseinitiative.org/about> [<https://perma.cc/VG84-ZZR2>] (discussing the formation and expansion of the SSE Initiative, “a peer-to-peer learning platform” that works through dialogue, capacity building, and research to promote sustainable investing across the world’s stock exchanges).

sustainability information.²⁹¹ But relatively few have adopted *mandatory* sustainability disclosure policies relating to data collection, reporting, or verification.²⁹² As a result, stock exchange reporting frameworks have, to date, produced low disclosure rates and spotty sustainability metrics.²⁹³

Nevertheless, stock exchanges have the potential to jumpstart the development and adoption of a mandatory sustainability reporting framework.²⁹⁴ Indeed, some have already demonstrated real leadership and innovation in designing mandatory sustainability disclosure rules. At the end of 2017, for example, the Singapore Stock Exchange replaced its voluntary sustainability reporting regime with a so-called comply-or-explain disclosure framework.²⁹⁵ Under the new reporting rules, listed companies have two options. They can *comply* with the reporting standard by preparing and publishing an annual sustainability report that includes information on five “primary components,” namely: (1) the ESG factors that are most material to the company’s business strategy and model; (2) the company’s policies, practices, and performance with respect to those material ESG factors; (3) the company’s targets in relation to

291. Chesebrough et al., *supra* note 155, at 10; *see also* Anya Khamayzer, *Sustainability Reporting in Stock Exchanges ‘Comes of Age’*, GREENBIZ (Dec. 7, 2016) (stating that as of 2016, twenty-one stock exchanges have joined the Sustainability Stock Exchanges (SSE) initiative, pledging to provide sustainability reporting guidelines to their listed companies).

292. *See* Chesebrough et al., *supra* note 155, at 29 (reporting that seventy-one stock exchanges do not require sustainability reporting as a listing rule).

293. Morrow & Yow, *supra* note 12, at 5 (documenting low sustainability reporting rates among companies listed on the world’s stock exchanges); UNEP, *supra* note 288, at 13 (identifying as a barrier to sustainable investing growth stock exchanges’ “reluctan[ce] to require their listed companies to disclose sustainability information”).

294. Chesebrough et al., *supra* note 155, at 10 (stressing the unique position of stock exchanges to advance sustainable investing). In many respects, stock exchanges seem particularly attractive due to their potential to spark innovation in sustainability disclosure design. In the context of mandatory financial disclosures, some scholars have advocated for shifting securities regulation from the federal government to the states, basing this proposal, in part, on the regulatory innovations that could arise from states competing to list companies. *See* Romano, *supra* note 225, at 2392. Likewise, competition between stock exchanges for listings might lead them to formulate and adopt better sustainability policies and metrics. *Id.* at 2399 (“To the extent that maximizing trading volume is a function of listings, exchanges would be subject to the same incentives as states competing for charters, leading them to adopt listing requirements preferred by investors (or to shares discounted accordingly).”). Notwithstanding their potential to drive innovation in sustainability information regulation, stock exchanges have historically hesitated to impose mandatory sustainability disclosure requirements out of fear that unilateral action will reduce their attractiveness as a listings venue. UNEP, *supra* note 288, at 13. Thus, this Article suspects that competition among stock exchanges will not, by itself, address the issue of sustainability under-reporting. However, if stock markets could overcome this collective action problem (perhaps by agreeing that each will mandate disclosure on a certain number of sustainability factors), competitive forces might work to improve the design of a mandatory sustainability reporting regime.

295. *See SGX Launches Sustainability Reporting Guide and Rule: Will Provide Training and Tools to Companies*, SGX (June 20, 2016), http://sgx.com/wps/wcm/connect/sgxlite/sgx_en/home/highlights/news_releases/SGX_launches_Sustainability_Reporting_Guide_and_rule_will_provide_training_and_tools_to_companies?presentationtemplate=design_new/PT_Lite_Friendly [<https://perma.cc/NB4D-KBEM>]; *see generally* *SGX-ST Listing Rules: Practice Note 7.6: Sustainability Reporting Guide*, SGX (June 20, 2016), http://rulebook.sgx.com/net_file_store/new_rulebooks/s/g/SGX_Mainboard_Practice_Note_7.6_July_20_2016.pdf [<https://perma.cc/N2XC-MHE3>] (describing new sustainability reporting requirements).

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material ESG issues; (4) the sustainability reporting framework that the company used to guide its reporting and disclosure; and (5) a statement from the company's board concerning how the company integrates sustainability considerations into its strategic decisionmaking.²⁹⁶ Or they can explain their reasons failing to report on one or more of the primary components. Thus, the comply-or-explain model functions as a “soft” form of mandatory disclosure regulation in that companies are required to either disclose or explain their failure to disclose, but the choice between the two is left to each company's discretion.

Supporters of the comply-or-explain approach note that it has some advantages over both voluntary reporting frameworks and traditional mandatory disclosure regimes. In particular, the comply-or-explain model may provide greater incentives for companies to disclose information than voluntary reporting regimes, while simultaneously offering companies greater flexibility (and therefore lower compliance costs) than reporting regimes that mandate responses on all disclosure items.²⁹⁷ For example, rather than developing a costly monitoring program to track water consumption, a company might decide that it is more cost effective to explain to investors why water consumption is not material to its business operations or strategies. Notably, in this example, the company's failure to disclose its water consumption would nonetheless disclose valuable information to investors, namely, that the company faces minimal exposure to water shortage risks. Thus, in theory, a company's explanations for not disclosing under a comply-or-explain approach can themselves provide investors with material data on that company's sustainability risks and opportunities.²⁹⁸

While this Article sees real innovative potential in Singapore's comply-or-explain approach to mandatory sustainability reporting, it suspects that Singapore's disclosure framework will nonetheless fail to provide mainstream investors with the sustainability metrics that they need. Like the TCFD's regime, Singapore's reporting regime allows listed companies to pick and choose which ESG issues and metrics to disclose.²⁹⁹ Although the framework's five primary components of sustainability reporting provide broad guidance on the issues that

296. See *SGX-ST Listing Rules*, *supra* note 295, at 1-2; see also Fang Eu-Lin & Sahil Malhotra, *SGX Sustainability Reporting Guide: Key Highlights*, PRICEWATERHOUSECOOPERS 1-2 (2016), <https://www.pwc.com/sg/en/publications/assets/sustainability-reporting-sgx-2016.pdf> [<https://perma.cc/43JR-XDPJ>] (summarizing this disclosure regime).

297. See Virginia Harper Ho, *'Comply or Explain' and the Future of Nonfinancial Reporting*, 21 LEWIS & CLARK L. REV. 317, 330 (2017) (summarizing the theoretical and empirical literature on the effects and benefits of comply-or-explain regimes).

298. Research on comply-or-explain regulations, however, has raised serious concerns about the adequacy of companies' explanations for noncompliance. In particular, several studies have found that, when companies elect to explain rather than comply, they frequently offer generic, boilerplate explanations that are of little value to investors. See *id.* at 333 (summarizing this literature).

299. See *SGX-ST Listing Rules*, *supra* note 295, ¶ 4.2 (directing the issuer to “review its business in the context of the value chain and determine what ESG factors, in relation to its interaction with its physical environment and social community and its governance, are material for the continuity of its business”).

companies should consider when crafting their annual sustainability reports, the definition and operationalization of sustainability is ultimately left to each company's discretion. True, the Singapore Stock Exchange encourages some standardization by recommending that companies make their disclosures according to well-established sustainability reporting frameworks, such as the Global Reporting Initiative's Sustainability Reporting Guidelines.³⁰⁰ However, this Article contends that a *uniform* set of methodological standards will be needed to achieve the level of comparability that mainstream investors require. Ultimately, in giving listed companies so much flexibility over the substance and methods of ESG reporting, Singapore's disclosure regime misses an opportunity to create sustainability metrics that are standardized, comparable, and therefore useful to mainstream investors.

Notably, the Hong Kong Stock Exchange has taken some promising steps in recent years to address the problem of comparability among ESG metrics. Like the Singapore Stock Exchange, it deploys a comply-or-explain model of mandatory reporting in which listed companies are supposed to make disclosures with respect to three "Environmental Subject Areas" and eight "Social Subject Areas."³⁰¹ In January of 2017, however, the Hong Kong Stock Exchange began requiring all listed companies to report on twelve environmental "key performance indicators" (KPIs).³⁰² The KPIs are notable for their specificity and their quantitative nature. To take just a few examples, companies are required to report (or explain why they did not report) their greenhouse gas emissions, energy consumption, hazardous and nonhazardous waste production, and water consumption on an absolute basis (e.g., total tons) and on an intensity basis (e.g., tons per product).³⁰³ While it remains to be seen whether Hong Kong's comply-or-explain model can generate high disclosure rates on these twelve environmental metrics, Hong Kong has undoubtedly taken a key, innovative step toward developing the set of core sustainability indicators envisioned by this Article.

Moving forward, however, the Hong Kong Stock Exchange should consider supplementing this core tier of environmental KPIs with industry-specific and governance KPIs. As this Article has argued, although core sustainability indicators are essential to an effective sustainability disclosure

300. See *id.* ¶¶ 4.15-4.16.

301. See *Analysis of Environmental, Social and Governance Practice Disclosure in 2016/2017*, HKEX 6 (May 2018), https://www.hkex.com.hk/-/media/HKEX-Market/Listing/Rules-and-Guidance/Other-Resources/Exchanges-Review-of-Issuers-Annual-Disclosure/ESG-Guide/esgreport_2016_2017.pdf [<https://perma.cc/Y9SZ-ULVZ>] [hereinafter *HKEX Analysis*]; see also *Environmental, Social and Governance Reporting Guide*, HKEX ¶¶ 4, 6, http://en-rules.hkex.com.hk/net_file_store/new_rulebooks/h/k/HKEX4476_3841_VER10.pdf [<https://perma.cc/7F3D-QYDT>] [hereinafter *HKEX ESG Rules*] (listing current sustainability reporting requirements).

302. See *HKEX Analysis*, *supra* note 301, at 6; see also *HKEX ESG Rules*, *supra* note 301, at A27-4 to -6 (listing all twelve environmental KPIs).

303. See *HKEX ESG Rules*, *supra* note 301, at A27-4 to -6.

regime because they allow investors to draw broad comparisons across industries, mainstream investors also need industry-specific metrics that allow them to evaluate the most salient sustainability risks and opportunities facing individual companies. At the moment, the Hong Kong Stock Exchange attempts to account for industry-specific sustainability attributes by encouraging listed companies to “identify and disclose additional ESG issues and KPIs . . . that reflect the issuer’s significant environmental and social impacts.”³⁰⁴ While such a flexible reporting approach allows a company to disclose its unique sustainability profile, it also risks producing sustainability information that does not allow for comparisons between peer companies. To balance the need for standardization with the need to account for the diversity of sustainability challenges and opportunities that face different companies, the Hong Kong Stock Exchange should pilot industry-specific KPIs that focus on the most important sustainability issues for different industries.

Notably, it appears that the Hong Kong Stock Exchange is on its way to developing the third tier of governance indicators recommended by this Article. For a number of its Social Subject Areas, the reporting regime outlines several optional KPIs that relate to general corporate governance, such as (1) average training hours completed per employee by gender and employee category (e.g., senior management, middle management), (2) employee turnover rate by gender, age group, and geographical region, and (3) descriptions of supply chain management practices.³⁰⁵ The Hong Kong Stock Exchange should not only make reporting on these types of general governance KPIs mandatory, as it has done with the environmental KPIs, but should also expand its governance KPIs to cover sustainability-specific governance issues, such as board oversight of sustainability risks and company procedures for monitoring and responding to sustainability pressures.

Of course, the design principles discussed in this Article only provide general guidance on the development of a sustainability disclosure regime for mainstream investors. The real challenge will lie in fleshing out the technical details of such a reporting framework, including how to define industry categories and which sustainability performance issues are most salient in each industry.³⁰⁶ Moreover, this Article suspects that the reporting framework will need to be updated over time as research on corporate sustainability performance and metrics continues to evolve. Nonetheless, these policy design challenges should not prevent regulators from moving forward on a mandatory disclosure framework for corporate sustainability. As discussed below in Section III.C, the cost-benefit analysis of such a framework weighs strongly in favor of this new form of information regulation.

304. *Id.* ¶ 6.

305. *Id.* at A27-7 to -13.

306. Lydenberg et al., *supra* note 168, at 10 (identifying as “[o]ne of the chief challenges of sustainability reporting . . . striking a balance between comprehensiveness and relevance”).

C. Costs & Benefits

This Article has argued that informational barriers have stymied investors' interest in sustainability. It has suggested that a mandatory disclosure regime would better address these obstacles than existing voluntary disclosure initiatives, and it further outlined several key guiderails for developing this new environmental information regulation. But even assuming these arguments to be true, policymakers may still not want to pursue the proposed approach if the costs of the new regulation outweigh its benefits to society.

This Article maintains, however, that the welfare analysis weighs decidedly in favor of a mandatory sustainability disclosure regime. On the benefits side of the ledger, the proposed information regulation directly addresses a key problem facing policymakers: the insufficiency of taxpayer dollars to solve today's most pressing sustainability challenges.³⁰⁷ For example, according to a recent study conducted by Ceres and Bloomberg New Energy Finance, achieving the Paris Agreement's goal of limiting global warming to below two degrees Celsius will require about \$12 trillion of investments in clean energy power generation over the next 25 years.³⁰⁸ Realizing the Sustainable Development Goals (SDG) will likewise require significant financing—on the order of \$5 to \$7 trillion annually.³⁰⁹ Government coffers alone cannot bridge either of these finance gaps.

307. See Douglas Beal et al., *Narrowing the SDG Investment Gap: The Imperative for Development Finance Institutions*, BOS. CONSULTING GROUP (Feb. 12, 2018), <https://www.bcg.com/publications/2018/narrowing-sdg-investment-gap-imperative-development-finance-institutions.aspx> [<https://perma.cc/TUY8-LR6E>] (attributing slow progress on Sustainable Development Goals to a failure to effectively mobilize private investors); Marga Hoek, *Why Mobilizing Private Capital Towards the SDG Is Good for Business*, GREENBIZ (Feb. 17, 2018, 2:00 AM), <https://www.greenbiz.com/article/why-mobilizing-private-capital-towards-sdgs-good-business> [<https://perma.cc/YA9X-UXNA>] (achieving the Sustainable Development Goals by 2030 will require a massive mobilization of private capital); United Nations, *Trends in Private Sector Climate Finance*, RELIEFWEB 8 (Oct. 9, 2015), <https://reliefweb.int/sites/reliefweb.int/files/resources/sg-trends-private-sector-climate-finance-aw-hi-res-web1.pdf> [<https://perma.cc/8JJ3-D3U5>] (“While the public sector has a vital role to play, the private sector will provide the bulk of the financing and insurance driving the transition to a low-carbon economy.”).

308. Ethan Zindler & Ken Locklin, *Mapping the Gap: The Road from Paris: Finance Paths for a 2-Degree Future*, BLOOMBERG 3 (Jan. 27, 2016), https://data.bloomberglp.com/bnef/sites/4/2016/01/CERES_BNEF_MTG_Overview_Deck_27January.pdf [<https://perma.cc/C867-8Q69>]; see also *Deep Energy Transformation Needed by 2050 to Limit Rise in Global Temperature*, IEA (Mar. 20, 2017), <https://www.iea.org/newsroom/news/2017/march/deep-energy-transformation-needed-by-2050-to-limit-rise-in-global-temperature.html> [<https://perma.cc/J79R-28RL>] (estimating that the world needs to invest \$3.5 trillion per year in the energy sector alone prevent the global temperature from rising by over two degrees Celsius).

309. Chesebrough et al., *supra* note 155, at 6. On September 25, 2015, 193 countries adopted the 2030 Agenda for Sustainable Development, which includes 17 Sustainable Development Goals and 169 targets relating to poverty, education, gender equality, clean water, and income inequality—among other sustainability issues. See United Nations, *UN Adopts New Global Goals, Charting Sustainable Development for People and Planet by 2030*, UN NEWS (Sept. 25, 2015), <https://news.un.org/en/story/2015/09/509732-un-adopts-new-global-goals-charting-sustainable-development-people-and-planet> [<https://perma.cc/N9SA-3WNP>].

Rather, as one recent United Nations report put it: “the scale of the investment challenge requires new flows of private capital.”³¹⁰

To the extent that a mandatory reporting regime can help align capital markets with sustainability objectives, it will generate large dividends for the environment and society. It is risky, of course, to speculate about the effects of a sustainability disclosure framework that has no comparable real-world analog. However, we suspect that implementation of the proposed regulation would yield a number of beneficial consequences. To begin, we believe that the disclosure framework would provide mainstream investors with the informational tools they need to confidently integrate sustainability considerations into their portfolios. The first tier of core sustainability indicators would allow these investors to bring a broad sustainability tilt to their investments by enabling cross-industry comparisons across broad swaths of companies. The industry-specific and governance indicators would help investors fine-tune their portfolios to balance their sustainability preferences and their desired rates of return. The disclosure’s overarching focus on materiality would further bring mainstream investors into the folds of the sustainable investing movement, as would the adoption of a uniform set of methodologies for sustainability data, which would boost confidence in the accuracy of sustainability metrics as market signals. As a result, we expect that the proposed disclosure framework would expand both the number of sustainable investors and the amount of sustainable investments, thereby encouraging the broad movement of capital away from unsustainable industries and toward sustainable ones.

At the same time, the framework’s commitment to expanding sustainability green lights would help redirect capital toward sustainability leaders within and across industries. Over time, these green-light metrics would help both investors and corporate executives come to understand the financial premiums that can arise from sustainability leadership. More companies may, in turn, decide to pursue ambitious sustainability action plans that are in the spirit of Unilever’s Sustainable Living Plan or General Electric’s Ecomagination program. More generally, well-designed green light metrics that focus on the profit potential of sustainability initiatives may engender a broader shift in the business community’s thinking on sustainability, helping to reframe sustainability pressures as core business opportunities, rather than simply as fringe risks.

At the same time, we believe that the proposed reporting regime would expose companies to new competitive forces around key sustainability problems, and thereby sharpen companies’ focus on developing sustainability solutions. Through the second tier of industry-specific indicators, companies would see themselves ranked against their peers across an array of material sustainability issues. As predicted by the success of the TRI program, such comparative rankings would not only harness market forces to pressure companies into improving their sustainability performance, but they would also encourage

310. Chesebrough et al., *supra* note 155, at 6.

corporate introspection, as companies are inspired by their peers to re-examine their procedures and practices in search of hidden or overlooked inefficiencies. We suspect that these external pressures to become more sustainable would be enhanced by the first tier of core sustainability indicators, which would create sustainability competition across industries. At the same time, internal pressures to become more sustainable would be enhanced by the third tier of governance indicators, which would force companies to examine their internal management and governance structures for handling sustainability challenges and opportunities. We therefore expect that companies would respond to the proposed mandatory reporting regime by increasing investments in clean technology R&D, developing new product lines around sustainability issues, collaborating with supply partners to enhance the resiliency of supply chains to sustainability pressures, and integrating sustainability considerations into business planning, investment decisions, and corporate governance.

To be clear, this Article is not suggesting that solving the sustainability information problems outlined above will necessarily channel trillions of dollars of capital toward sustainability problems—although it would be a step in the right direction.³¹¹ The final impact of a mandatory sustainability disclosure regime will likely depend in part on factors that lie outside the control of policymakers, such as the true scope and frequency of win-win opportunities and how investors weigh long-term, sustainability-driven growth against short-term, unsustainable gains.³¹² That said, even modest movements toward sustainable investing could yield large benefits given the size of today’s capital markets. In 2016, for example, the SDG finance gap could have been closed with only about eight percent of total assets under management globally.³¹³

The societal benefits of increased sustainable investing would also likely exceed any compliance costs associated with a mandatory reporting regime. True, collecting sustainability data may require some firms to invest in new monitoring equipment or data management systems.³¹⁴ And the costs of

311. Recall, after all, the responsiveness of stock markets to TRI disclosures. *See supra* Part II.

312. *See supra* Sections II.A-II.B.

313. In 2016, total assets under management globally summed to about \$87 trillion. *See Global Sustainable Investment Review 2016, supra* note 12, at 3 (reporting in Table 1 total sustainable assets of \$22.89 trillion and in Table 2 the proportion of sustainable investments relative to total managed assets to be 26.3% in 2016, such that total managed assets in 2016 equals \$87 trillion (\$22.89 trillion/0.263)). As noted above, achieving the SDGs is estimated to require \$5-7 trillion annually. *See* Chesebrough et al., *supra* note 155, at 6. Thus, this finance gap could be covered with roughly 8% of total assets managed (\$7 trillion to achieve the SDGs/\$87 trillion of total managed assets globally).

314. *See* Bartels et al., *supra* note 161, at 21 (2013) (“The requirement for companies to disclose sustainability information is seen by some business associations as an increase in red tape, administrative burdens, and increased direct costs.”); Ioannou & Serafeim, *supra* note 221, at 5 (“Critics of sustainability disclosure regulations argue that companies that are ‘forced’ to increase disclosure will bear significant costs either because of the disclosure per se or because of the changes in managerial practices that they will be forced to make, thus destroying shareholder value.”); Lydenberg et al., *supra* note 168, at 6 (“The arguments most often made against mandatory reporting, and in favor of continuing the current regime of voluntary reporting, are typically ones of practicality and costs—it is difficult for

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mandatory auditing and verification of self-reported data can be substantial for companies, especially during the first several years.³¹⁵ But a sustainability disclosure framework that focuses on a core set of common ESG metrics covering no more than ten to fifteen issues—combined with a limited number of material, industry-specific sustainability performance measures—should help to contain these costs. Indeed, recent empirical research suggests that existing mandatory reporting regimes requiring basic sustainability data have not imposed burdensome costs on firms.³¹⁶ Moreover, for sustainability leaders in particular, any additional reporting costs may very well be offset by increases in stock value as mainstream investors—guided by a clearer and more robust set of sustainability metrics—begin adding a sustainability tilt to their portfolios.³¹⁷ As a result, a well-designed mandatory disclosure program might actually increase shareholder value, net the additional reporting expenses, by allowing leading firms to finally cash in on sustainability premiums.³¹⁸

Furthermore, a mandatory reporting regime likely imposes fewer costs than other forms of environmental regulation. As noted above, environmental information regulation is known for its relatively light regulatory touch and high value.³¹⁹ The sustainability disclosure regime proposed by this Article is no different. Unlike command-and-control regulations, for example, mandatory sustainability reporting does not attempt to force capital markets to align with

regulators or stock exchanges to determine what data should be required and how to monitor the adequacy of its reporting; and it is expensive for companies to compile sustainability data.”); *see also supra* note 221 and accompanying text.

315. *See* Esty & Cort, *supra* note 14, at 35; *see also* Lois Guthrie et al., *Frequently Asked Questions on Corporate Sustainability Reporting: Tackling the Big Questions Around the Global Corporate Sustainability Reporting Agenda*, GLOBAL REPORTING 20 (2013), <https://www.globalreporting.org/resource/library/gof47para47-faqs.pdf> [https://perma.cc/LK4X-DXME] (reviewing some evidence that “external assurance represents the highest cost” in preparing corporate sustainability reports).

316. Professors Ioannis Ioannou and George Serafeim empirically analyzed the effects of mandatory sustainability disclosure requirements in China, Denmark, Malaysia, and South Africa. Their analysis revealed that “the net effect of mandating sustainability reporting is, on average, value-enhancing rather than value-destroying.” Ioannou & Serafeim, *supra* note 221, at 6. These findings suggest that the benefits of increased sustainability disclosure (e.g., enhanced corporate reputation, better management of risks and operations) outweighed the costs of increased sustainability disclosure (e.g., expenses associated with gathering, verifying, and disseminating new ESG data). *Id.* at 5.

317. Professors Jody Grewal, Edward J. Riedl, and George Serafeim, for example, empirically analyzed the stock market effects of the European Union’s Directive 2014/95, which mandated increased disclosure of ESG information by various companies. Grewal et al., *supra* note 122, at 2. They found that stock prices fell as a result of the new regulation for firms with low ESG disclosure levels prior to regulation, as well as firms with weak ESG performance. *Id.* at 3-4. However, they also found that stock prices rose for firms that exhibited high ESG disclosure levels and strong ESG performance. *Id.* at 4. These results are consistent with the hypothesis that sustainability leaders enjoy net financial benefits from increased disclosure of sustainability data.

318. For a discussion of sustainability premiums, *see supra* Section II.A and accompanying text. Notably, if policymakers are concerned about reporting costs, they could adopt a “comply or explain” approach whereby firms are required to either report on a particular sustainability metric or explain why they are unable to do so. Although this more flexible disclosure framework allows firms to opt out of reporting, it has, in practice, increased sustainability disclosure rates. *See* Ioannou & Serafeim, *supra* note 221, at 3-4.

319. *See supra* notes 40-41 and accompanying text.

sustainability objectives. Rather, it seeks merely to unlock investor interest in sustainability that already exists. Arguably then, it goes after the lowest hanging opportunities to further the sustainability agenda. Moreover, it builds on existing intellectual and regulatory infrastructure, including decades of experimentation and development of sustainability metrics and an even longer history of mandatory financial disclosures.³²⁰ As a result, the costs of designing the proposed regulation should be relatively small. Taken together, there are strong reasons to believe that the benefits of a mandatory sustainability disclosure regime would substantially outweigh its costs.

We note that this calculus does not depend on the validity of the well-known, but contentious, efficient capital market hypothesis.³²¹ According to this theory of finance, investors cannot systematically beat the market (i.e., receive above-market returns) through strategic stock picking (e.g., selecting sustainable companies over unsustainable ones).³²² This conclusion follows from the premise that information spreads very quickly through capital markets.³²³ Thus, when new information about a company or industry is released into the public domain, stock prices adjust almost instantaneously as hordes of investors quickly sell or buy shares that have become over- or undervalued as a result of the new information.³²⁴ In turn, the prices of the over- or undervalued firms will fall or

320. See *supra* notes 161-164 and accompanying text.

321. See Michael L. Barnett & Robert M. Salomon, *Beyond Dichotomy: The Curvilinear Relationship Between Social Responsibility and Financial Performance*, 27 STRATEGIC MGMT. J. 1101, 1104 n.3 (2006) (“There remains considerable debate in the finance literature as to whether, and in what form, the EMH [efficient market hypothesis] holds.”); Richard H. Thaler, *Behavioral Economics: Past, Present, and Future*, 106 AM. ECON. REV. 1577, 1587 (2016) (“There is an enormous literature devoted to testing this hypothesis, with many arguments on each side.”).

322. See John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 VA. L. REV. 717, 719 n.10 (1984) (“[T]he basic point [is] that investors cannot ‘beat’ the market based on diligent search efforts.”); Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 554-55 (1984) (“[T]he empirical claim [is] that ‘available information’ does not support profitable trading strategies or arbitrage opportunities.”). For a review of the literature on the efficient capital markets hypothesis, see generally Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FIN. 1575 (1991); and Burton G. Malkiel, *The Efficient Market Hypothesis and Its Critics*, 17 J. ECON. PERSP. 59 (2003).

323. Malkiel, *supra* note 322, at 59.

324. John H. Langbein & Richard A. Posner, *Social Investing and the Law of Trusts*, 79 MICH. L. REV. 72, 81-82 (1980). Market efficiency comes in three forms: weak, semi-strong, and strong. See Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 383 (1970) (labeling and defining these three forms of efficiency). The weak form holds that stock prices reflect all information on the past history of asset prices. The semi-strong version maintains that stock prices reflect all publicly available information, and the strong form holds that stock prices incorporate all information, both public and private. See Michael S. Knoll, *Ethical Screening in Modern Financial Markets: The Conflicting Claims Underlying Socially Responsible Investment*, 57 BUS. LAW. 681, 693 n.88 (2002). Notably, most economists do not believe that the strong form exists in reality; there is, however, some empirical support for semi-strong efficiency. See, e.g., *id.*; Fama, *supra* note 322, at 415 (“[T]he strong-form efficient markets model, in which prices are assumed to fully reflect all available information, is probably best viewed as a benchmark against which deviations from market efficiency (interpreted in its strictest sense) can be judged.”); Daniel R. Fischel, *Efficient Capital Markets, The Crash, and the Fraud on the Market Theory*, 74 CORNELL L. REV. 907, 911 (1988) (“The empirical evidence to date (with some exceptions) appears to establish the validity of the weak and semi-strong

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rise until the risk-adjusted returns are identical across all publicly traded companies of the same systemic-risk class.³²⁵ While those investors who acted first on the information release may realize above-market returns, adherents to the efficient market hypothesis argue that few investors will consistently have this information edge over their peers, given the vast number of investors and analysts dedicated to continuously combing markets for relevant financial data.³²⁶ Therefore, they contend that stock picking cannot outperform market indices in the long run.³²⁷

Whether capital markets are, in fact, efficient remains a hotly debated issue among finance scholars. Advancements in behavioral finance research have contested many of the theory's central tenants.³²⁸ Other work suggests that stock prices are particularly slow to incorporate information on intangible assets, including many sustainability initiatives.³²⁹ In addition, today's capital markets are notorious for their focus on short-term profit maximization.³³⁰ They may therefore misprice the long-term value creation resulting from sustainability

versions but not the strong form of the efficient capital markets hypothesis.”). This Article assumes the semi-strong version of the efficient capital market hypothesis.

325. Thus, returns may vary, but they will be offset by higher risk. See Langbein & Posner, *supra* note 324, at 78-79. Risk comes in two forms: diversifiable risk or non-diversifiable risk (i.e., systemic risk). Diversifiable risk can be eliminated through portfolio expansion. By contrast, systemic risk can be reduced, but not zeroed out completely. *Id.* at 79-80.

326. See *id.* at 81-82; Donald C. Langevoort, *Theories, Assumptions, and Securities Regulation: Market Efficiency Revisited*, 140 U. PA. L. REV. 851, 851 (1992) (describing the efficient market hypothesis's “central insight” as being a recognition that “a variety of forces impound available information into stock prices fast enough that arbitrage opportunities cannot be exploited systematically”).

327. Langbein & Posner, *supra* note 324, at 81-82. Indeed, stock-picking strategies are expected to yield subpar returns due to losses in portfolio diversification and higher transaction costs. See Derwall, *supra* note 148, at 51 (noting that the efficient market hypothesis “suggests that socially responsible investors, who would be inherently suffering from imposed limits to diversification, should report suboptimal returns when the appropriate performance attribution framework is used”); Knoll, *supra* note 324, at 694-700 (discussing both the diversification and transaction costs of socially responsible investing).

328. See, e.g., ANDREI SHLEIFER, *INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE 2* (2000); Richard H. Thaler, *Preface*, in 2 *ADVANCES IN BEHAVIORAL FINANCE*, at xi-xvii (Richard H. Thaler ed., 2005); Thaler, *supra* note 321, at 1590 (“The conclusion I reach from research in behavioral finance is that even these most efficient markets often lead to empirical results that are inconsistent with theories based on rational investors making choices in markets with tiny transactions.”).

329. Busch et al., *supra* note 12, at 315.

330. See, e.g., Dominic Barton & Mark Wiseman, *Focusing Capital on the Long Term*, HARV. BUS. REV. 50 (Jan.-Feb. 2014), <https://hbr.org/2014/01/focusing-capital-on-the-long-term> [<https://perma.cc/FXS7-C7SJ>] (discussing the downsides arising out of the “continuing pressure on public companies from financial markets to maximize short-term results”); see also *supra* note 252 and accompanying text.

leadership.³³¹ Indeed, a growing number of empirical studies suggest that sustainability-conscious portfolios can outperform the market in the long run.³³²

However, even if the efficient market hypothesis holds true, it would not undermine the desirability or policy logic of a mandatory sustainability disclosure regime. This Article has argued that well-designed sustainability reporting requirements will generate new financially material information on sustainability leaders and laggards.³³³ On the basis of this new information, an efficient capital market should respond by shifting investments away from overvalued firms (sustainability laggards) and toward undervalued firms (sustainability leaders). Thus, even if individual investors cannot systematically beat the market on the basis of sustainability factors, mandatory disclosure of material sustainability information will nonetheless increase overall sustainable investment levels—thereby realizing the public policy objectives of the proposed information regulation.³³⁴

IV. Conclusion

American environmental law needs fresh thinking on regulatory design to solve the sustainability challenges of the twenty-first century. While the traditional command-and-control model of environmental regulation made great strides in cleaning up and protecting the nation's environment and public health, this regulatory strategy has become outdated in the face of today's increasingly complex sustainability problems—including, most notably, climate change.³³⁵

331. See Derwall, *supra* note 148, at 51 (“Proponents of SRI, however, typically argue that corporate social responsibility reflects the company managers’ views on how the company will perform in the long term. These views may be mispriced because of short-term thinking within the financial community.”); Christopher P. Skroupa, *ESG Reporting Reshapes Global Markets*, FORBES (Apr. 24, 2017), <https://www.forbes.com/sites/christopherskroupa/2017/04/24/esg-reporting-reshapes-global-markets> [<https://perma.cc/S43A-AKND>] (linking investor reluctance to invest based on sustainability-driven growth to short-termism in capital markets).

332. See, e.g., Barnett & Salomon, *supra* note 321, at 1104 (“Despite the financial logic of modern portfolio theory, many researchers have found that SRI funds yield returns that equal or exceed those of mutual funds that operate without the constraints of social responsibility.”); Clark et al., *supra* note 12, at 10 (reviewing studies showing that “investment strategies that incorporate ESG issues outperform comparable non-ESG strategies”).

333. See *supra* Section III.A.

334. Of course, this conclusion only holds true if mandatory disclosure generates new sustainability performance information that is materially relevant to financial performance. Sustainability metrics that do not correlate with value creation will be less effective at aligning efficient capital markets with public policy goals. For one, mainstream investors will likely eschew those metrics, given their preferences for maintaining robust portfolio returns. For another, efficient markets will mitigate the impacts of any stockholder who invests on the basis of nonfinancial factors. For example, suppose that a socially responsible investor withdraws her capital from a company for purely moral reasons. If capital markets are efficient, other investors will step into her place, recognizing that the socially responsible investor has undervalued the company. Thus, the net result is that the socially responsible investor’s divestment has a negligible impact on the company’s finances. For these reasons, this Article calls for the development of material ESG metrics that link sustainability to corporate financial performance.

335. See, e.g., Carol A. Casazza Herman et al., *Breaking the Logjam: Environmental Reform for the New Congress and Administration*, 17 N.Y.U. ENVTL. L.J. 1, 4 (2008) (“The first wave of federal environmental regulation was aimed at addressing easily understood gross insults to the

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As a number of scholars have noted, much of the low-hanging fruit has already been harvested under the current command-and-control regime, and it will be costly to continue to use this model to address new sustainability challenges.³³⁶ As Professor Esty recently argued, it makes sense to go “beyond ‘red lights’ that tell polluters what they cannot do, and create[] an expanded structure of green lights—incentives to spur fresh thinking and creative responses to persistent pollution challenges.”³³⁷

The present Article answers this call by recasting environmental information regulation to harness mainstream investors’ growing interest in sustainability. Like American environmental regulation writ large, the standard model of environmental information regulation has worked to create a series of red lights that warn investors away from environmental laggards and penalize poor environmental performance. But it has done much less to identify and reward sustainability leaders who deliver innovative solutions to critical sustainability problems. As this Article argues in Part II, the red-lights model may have worked well when investors’ interest in sustainability remained limited to a few socially responsible investors. But it has become increasingly obsolete in the face of growing interest in sustainability among mainstream investors. Now, as with American environmental law more generally, regulators must commit to developing an expanded set of green lights if they hope to fully harness the potential of sustainable investing.

Toward this end, Part III outlines several core features of a revamped sustainability information regulation for mainstream investors. It argues, in particular, for a framework that is based on the principles of financial materiality and that is capable of identifying sustainability leaders and laggards. Developing the optimal menu of industry-specific sustainability metrics will certainly be a challenge. But there are good reasons to believe that efforts to develop a robust mandatory sustainability disclosure framework will succeed. For one, such a regulation has strong support from large segments of the investor community. For another, much of the intellectual and regulatory groundworks for a mandatory sustainability reporting program have already been laid through

environment—smog filled urban air, flammable rivers, uncontrolled smoke stacks, and discharge pipes. Hierarchical command and control regulatory approaches were generally well-suited to addressing such problems. But these approaches now need to be augmented with additional regulatory tools to address a number of environmental problems that have proven intractable to hierarchical regulation (such as non-point water pollution) and new problems that have yet to be tackled (such as climate change).”); Peter Lehner, *The Logjam: Are Our Environmental Laws Failing Us or Are We Failing Them?*, 17 N.Y.U. ENVTL. L.J. 194, 196 (2008) (underscoring the progress that has been made under existing environmental statutes and regulations, while also calling for new regulatory approaches to environmental management and protection).

336. See, e.g., Jonathan Adler, *Free and Green: A New Approach to Environmental Protection*, 24 HARV. J.L. & PUB. POL’Y 653, 659 (2001) (detailing the costs and limits of the existing environmental regulatory system); Karkkainen, *supra* note 1, at 264 (noting that conventional environmental regulation has already picked much of the “low-hanging fruit” and has been “less successful at controlling emissions from small mobile sources . . . or diffuse sources”).

337. Esty, *supra* note 9, at 5.

decades of financial disclosure standards and years of experimentation with sustainability metrics. Regulators should not let this policy window pass, as few sustainability regulations promise so many benefits for so little cost. Rather, they should act now and harness this momentum toward sustainability by updating environmental information regulation to the needs of the twenty-first-century investor.