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The Case for Corporate Climate Ratings: Nudging Financial Markets

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The Case for Corporate Climate Ratings: Nudging Financial Markets

Felix Mormann[†] and Milica Mormann^{*}

Capital markets are cast as both villain and hero in the climate playbill. The trillions of dollars required to combat climate change leave ample room for heroics from the financial sector. For the time being, however, capital continues to flow readily toward fossil fuels and other carbon-intensive industries. Drawing on the results of an empirical study, this Article posits that ratings of corporate climate risk and governance can help overcome pervasive information asymmetries and nudge investors toward more climate-conscious investment choices with welfare-enhancing effects.

In the absence of a meaningful price on carbon, three private ordering initiatives are trying to mobilize capital markets as a force for good in the war on carbon. But shareholder climate activism, calls for better climate-related financial disclosures, and the divestment movement have yet to usher in the paradigm shift toward low-carbon capitalism.

Corporate climate ratings overcome existing information asymmetries to nudge investors toward more carbon-conscious allocation of their assets. Every year, rating agencies like Standard & Poor's, Moody's, and Fitch pass judgment on over one hundred trillion dollars' worth of securities. Modeled after these well-established ratings of creditworthiness, independent ratings of companies' climate risk and governance can redirect the flow of capital away from high-carbon assets toward more climate-friendly options—without the need for government authorization or other market-distorting interventions.

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A series of survey experiments, with over fifteen hundred participants, test and demonstrate the capacity of corporate climate ratings to promote low-carbon investment. Inclusion of climate ratings among the performance metrics commonly considered by investors significantly increases investment in the stock of companies with favorable climate ratings, even when other stocks boast a stronger return profile. Variations in the ratings' framing and format, informed by insights from behavioral economics and finance, facilitate recommendations for best practices and future research.

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INTRODUCTION

Capital markets have a conflicted relationship with climate change. Gone are the days when companies and their shareholders could afford to simply ignore the risks associated with global warming, sea level rise, and other manifestations of our planet's changing climate.¹ Too large is the physical risk flowing from more frequent extreme weather events and long-term shifts in climate patterns that threaten food and water supplies.² Add to that the transition risk arising from changes in policy, technology, and markets as part of the shift to a low-carbon economy and it becomes clear why climate change has truly arrived on Wall Street.³

Considering the ubiquity and severity of these risks, it comes as no surprise that investors increasingly urge publicly traded companies to disclose climate-related risk and to develop more decisive strategies for mitigation and adaptation.⁴ Regulatory pressure, too, is mounting. Over three dozen central banks and other financial regulators representing five continents have sounded a clarion call for better disclosure of climate risk on financial markets.⁵ Yet, companies continue to vary dramatically in their

1. See, e.g., Brad Plumer, *Companies See Climate Change Hitting Their Bottom Lines in the Next 5 Years*, N.Y. TIMES (June 4, 2019), <https://nyti.ms/2XodNCZ> [<https://perma.cc/JZ99-EEMN>] (reporting estimates of aggregate corporate costs imposed by climate change of approximately \$1 trillion in the coming decades).

2. For an illustrative example of physical risk, see LUCIA BEVERE ET AL., SWISS RE INST., NATURAL CATASTROPHES AND MAN-MADE DISASTERS IN 2018: "SECONDARY" PERILS ON THE FRONTLINE 1, 2, 6 (2019) (reporting a record \$219 billion in insured losses from natural catastrophes for 2017–18 alongside greater frequency and severity of extreme weather events). According to the National Centers for Environmental Information, eighteen separate billion-dollar weather and climate disaster events ravaged the United States in the first nine months of 2021 alone, causing losses of \$105 billion and bringing the 5-year loss average to \$140 billion per annum. See *Billion-Dollar Weather and Climate Disasters: Time Series*, NOAA, <https://www.ncdc.noaa.gov/billions/time-series> [<https://perma.cc/3799-HZHL>].

3. For an eloquent illustration of climate-related transition risk, see Sarah E. Light, *The Law of the Corporation as Environmental Law*, 71 STAN. L. REV. 137, 167–68 (2019) (discussing investigations by the SEC and the New York Attorney General's office into whether ExxonMobil misled its investors about the possibility that the company's oil reserves could become inaccessible if future climate regulations prohibited their extraction).

4. See TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, 2019 STATUS REPORT, at iii (2019) ("[T]here is a growing demand for . . . climate-related financial information by investors."). For a more generalized account of the virtues of mandatory disclosure in financial markets, see John C. Coffee, Jr., *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 VA. L. REV. 717 (1984).

5. See NETWORK FOR GREENING THE FIN. SYS., A CALL FOR ACTION: CLIMATE CHANGE AS A SOURCE OF FINANCIAL RISK 5, 31 (2019) (emphasizing the importance of a "robust and internationally consistent climate and environmental disclosure framework"); see also Sarah E. Light & Christina P. Skinner, *Banks and Climate Governance*, 121 COLUM. L. REV. 1894, 1934–40 (2021) (reporting on emerging climate governance efforts by major banks shaping borrower behavior through exercise of their lending power and funding low-carbon projects).

management and disclosure of climate risk, with many failing to consider, let alone disclose, the potential adverse impacts of climate change on their business.⁶

It is easy to forget, amidst calls for better climate risk disclosure and management, that climate change poses not only a threat for financial markets but also an enormous opportunity.⁷ After all, where else should the massive amounts of capital come from that are needed for a successful response to the climate crisis? According to the Intergovernmental Panel on Climate Change, the energy sector alone will require investment of approximately \$2.4 trillion *annually* over the next decade and a half if we are to prevent global warming from reaching the tipping point toward massive and irreversible damage to the global ecosystem.⁸ Others have pegged the investment needs for climate-resilient, low-carbon infrastructure at \$90 trillion, or \$6 trillion annually, between 2016 and 2030.⁹ Whatever the exact number, actual investment flows lag woefully behind projected needs. Recent data suggests that global climate investment averages below \$500 billion annually, roughly one-tenth

6. See, e.g., Roshan Wasim, *Corporate (Non)Disclosure of Climate Change Information*, 119 COLUM. L. REV. 1311, 1311 (2019) (“[T]here is virtually no discussion of climate change risks in publicly traded companies’ filings with the Securities and Exchange Commission and on other public platforms.”); TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, *supra* note 4, at iv (“[M]ore companies need to consider the potential impact of climate change and disclose material findings.”).

7. Close to 90% of companies, cities, and regions submitting voluntary climate-related disclosures are able to identify business opportunities as part of their management of climate risk. See Wasim, *supra* note 6, at 1320; see also ANDREW CLAPPER ET AL., WORLD WILDLIFE FUND ET AL., POWER FORWARD 3.0: HOW THE LARGEST U.S. COMPANIES ARE CAPTURING BUSINESS VALUE WHILE ADDRESSING CLIMATE CHANGE 2 (2017) (“The largest companies in the United States are steadily increasing their clean energy and energy efficiency efforts while improving their bottom lines.”); Lisa Benjamin, *The Road to Paris Runs Through Delaware: Climate Litigation and Directors’ Duties*, 2020 UTAH L. REV. 313, 351 (2020) (“Even for carbon-major corporations, energy transitions away from fossil fuels can be profitable.”). The Global Commission on the Economy and Climate expects direct economic gains from decisive global climate action to exceed \$26 trillion by the end 2030. See HELEN MOUNTFORD ET AL., GLOB. COMM’N ON THE ECON. & CLIMATE, UNLOCKING THE INCLUSIVE GROWTH STORY OF THE 21ST CENTURY: ACCELERATING CLIMATE ACTION IN URGENT TIMES 8–9 (2018).

8. See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, GLOBAL WARMING OF 1.5°C: AN IPCC SPECIAL REPORT ON THE IMPACTS OF GLOBAL WARMING OF 1.5°C ABOVE PRE-INDUSTRIAL LEVELS AND RELATED GLOBAL GREENHOUSE GAS EMISSION PATHWAYS, IN THE CONTEXT OF STRENGTHENING THE GLOBAL RESPONSE TO THE THREAT OF CLIMATE CHANGE, SUSTAINABLE DEVELOPMENT, AND EFFORTS TO ERADICATE POVERTY 22 (2018).

9. See JAN CORFEE-MORLOT ET AL., GLOB. COMM’N ON THE ECON. & CLIMATE, THE SUSTAINABLE INFRASTRUCTURE IMPERATIVE: FINANCING FOR BETTER GROWTH AND DEVELOPMENT 8, 23 (2016).

of the capital required to effectively combat climate change—and less than the annual subsidy hand-out to fossil fuel interests.¹⁰

In the words of Bob Litterman, former Head of Risk Management at Goldman Sachs, “[C]apital is flowing freely in the wrong direction, emissions continue to rise, catastrophic climate-related damages proliferate, and the threat of truly cataclysmic impacts increases.”¹¹ Why do financial markets continue to fund carbon capitalism instead of leveraging the investment needed to tackle the climate crisis? How can we unleash the power of capital markets as a force for good in the war on carbon? These are the questions this Article sets out to answer.

Part One takes stock of existing initiatives to mobilize financial markets in the fight against climate change and explains their limitations. Economists have long advocated for a price on carbon, in the form of a carbon tax or cap-and-trade regime, to internalize the social cost of greenhouse gas emissions and to provide market incentives for their abatement.¹² But a meaningful price on carbon remains politically elusive in many of the highest-emitting regions

10. PADRAIG OLIVER ET AL., CLIMATE POL’Y INITIATIVE, GLOBAL CLIMATE FINANCE: AN UPDATED VIEW 2 (2018) (estimating that global annual climate investment from combined public and private sources was below \$500 billion from 2012–2016); see CORFEE-MORLOT ET AL., *supra* note 9, at 8, 12, 23 (estimating the investment necessary to address climate change to be \$90 trillion from 2016 to 2030, or \$6 trillion annually, and reporting \$550 billion in fossil fuel subsidies for 2014, not counting the subsidy value inherent in the widely afforded ability to externalize associated environmental costs); see also Sophie Yeo, *Where Climate Cash Is Flowing and Why It’s Not Enough*, 573 NATURE 328, 329 (2019) (“[Climate investment] figures are rising, but researchers say that banks, investors and governments are not spending anywhere near enough money to stem the impacts of climate change—and they continue to fund projects that worsen the problem.”). President Biden acknowledged the urgent need to dramatically increase investment in low-carbon, climate-friendly assets, including the development of a climate finance plan, in his Executive Order on Tackling the Climate Crisis at Home and Abroad, issued within a week of taking office. Exec. Order No. 14008, 86 Fed. Reg. 7619 (Jan. 27, 2021).

11. Statement from Robert B. Litterman, Partner Kepos Cap. & Former Head of Risk Mgmt., Goldman Sachs, to the Senate Special Comm. on the Climate Crisis, *Climate Change Is a Risk Management Failure that Can and Must Be Fixed Immediately* (Mar. 12, 2020), <https://www.schatz.senate.gov/imo/media/doc/Litterman%20Testimony%20short%20version%20.pdf> [<https://perma.cc/UXB5-CDPE>].

12. See, e.g., David Klenert et al., *Making Carbon Pricing Work for Citizens*, 8 NATURE CLIMATE CHANGE 669, 669 (2018) (“Economic analyses have long recommended carbon pricing as an indispensable strategy for efficiently reducing GHG emissions and tackling climate change.”); Richard Schmalensee & Robert N. Stavins, *Lessons Learned from Three Decades of Experience with Cap and Trade*, 11 REV. ENV’T ECON. & POL’Y 59, 74 (2017) (“[C]ap-and-trade merits serious consideration when regions, nations, or subnational jurisdictions are developing policies to reduce GHG emissions.”); NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 18 (2007) (“Establishing a carbon price, through tax, trading or regulation, is an essential foundation for climate-change policy.”).

of the world.¹³ Without reliable government guidance, three initiatives are seeking to fill the policy void, with limited success to date.

In 2015, the G20 Finance Ministers and Central Bank Governors responded to growing concerns over the financial impact of climate change by creating the industry-led Task Force on Climate-Related Financial Disclosures, instructed to develop recommendations for consistent climate-related risk disclosure by publicly traded companies.¹⁴ The Task Force's recommendations, released in 2017 after extensive stakeholder consultations, have been well received by financial regulators, stock exchanges, credit rating agencies, and asset managers.¹⁵ The corporate targets of these recommendations, however, have responded less enthusiastically, with most companies continuing to make no meaningful disclosures of their climate-related risk.¹⁶ The tepid corporate reaction, coupled with the failure of the SEC and regulators elsewhere to turn non-binding recommendations into legal requirements, casts serious doubt on the near-term availability of decision-useful climate disclosures to guide investor choices.¹⁷

Lagging policy and regulatory action have united 615 institutional investors controlling over \$60 trillion in assets worldwide under the banner of Climate Action 100+, an initiative seeking to convince companies to curb emissions, improve climate governance, and strengthen climate-related

13. See, e.g., Robert N. Stavins, *The Future of US Carbon-Pricing Policy*, 1 ENV'T & ENERGY POL'Y & ECON. 8, 13–52 (2020) (discussing political obstacles to carbon pricing in the United States); Ian Bailey et al., *The Fall (and Rise) of Carbon Pricing in Australia: A Political Strategy Analysis of the Carbon Pollution Reduction Scheme*, 21 ENV'T POL. 691, 691–93 (2012) (analyzing the political strategies deployed for and against Australia's carbon pricing policy efforts); Jesse D. Jenkins, *Political Economy Constraints on Carbon Pricing Policies: What Are the Implications for Economic Efficiency, Environmental Efficacy, and Climate Policy Design?*, 69 ENERGY POL'Y 467, 469–76 (2014) (noting the multitude of political economy factors that combine to prevent adoption of carbon pricing at the socially optimal level).

14. See TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, PHASE I REPORT OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES 8–9 (2016).

15. See Press Release, Task Force on Climate-Related Fin. Disclosures, More than 1,000 Global Organizations Declare Support for the Task Force on Climate-Related Financial Disclosures and Its Recommendations (Feb. 12, 2020), <https://www.fsb-tcfd.org/press/more-than-1000-global-organizations-declare-support-for-the-task-force-on-climate-related-financial-disclosures-and-its-recommendations/> [<https://perma.cc/E8R6-RLPT>].

16. See TRUCOST ESG ANALYSIS, S&P GLOBAL, BEST PRACTICES IN CORPORATE CLIMATE DISCLOSURE: HOW THE LEADERS ARE LEADING 2, 8 (2019) (reporting that over one-third of companies issue no climate-related disclosures whatsoever, with others disclosing little, if any, information of value to investors).

17. See *infra* Part I.A.; see also Ian Edwards et al., *Climate-Related Financial Disclosures in the Public Sector*, 10 NATURE CLIMATE CHANGE 588, 589 (2020) (expressing concern that implementation of the Task Force's recommendations is proceeding too slowly to change investor behavior at a meaningful scale).

disclosures.¹⁸ Between 2017 and 2019, annual proxy seasons witnessed a steady rise in shareholder climate activism, coaxing commitments to better climate governance from Chevron, ExxonMobil, Shell, and other top emitters.¹⁹ The systemic, economy-wide risks associated with climate change have produced a paradigm shift among institutional investors based on a simple cost-benefit analysis. Calculating that the agency costs and firm-specific losses from their engagement with carbon-intensive companies will be outweighed by the overall benefits of better climate governance for their diversified portfolio holdings, institutional investors are increasingly abandoning their historical reluctance to exercise corporate governance rights.²⁰ But the momentum of shareholder climate activism has stalled of late raising concerns that Climate Action 100+ and similar initiatives may not be able to scale at the pace required to effectively mobilize financial markets in the fight against climate change.²¹

While shareholder climate activists advocate for change from within, the fossil fuel divestment movement urges investors to vote with their feet.²² Since 2014, more than 1,300 institutional investors managing nearly \$15 trillion in assets around the world have committed to dropping some, if not all, of their fossil fuel holdings.²³ With this “exodus” strategy, the divestment movement hopes to both delegitimize the fossil fuel industry and reduce its access to capital. Critics note, however, that the size of the global financial market and the liquidity of most fossil fuel stocks allow any divested holdings to quickly find their way into the portfolios of other, less concerned

18. Home Page, CLIMATE ACTION 100+, <http://www.climateaction100.org> [<https://perma.cc/T7R4-3HKU>].

19. See *infra* Part I.B (describing shareholder climate activism at these companies); see also Shirley Westcott, *Surprises from the 2018 Proxy Season*, HARV. L. SCH. F. ON CORP. GOVERNANCE (June 27, 2018), <https://corpgov.law.harvard.edu/2018/06/27/surprises-from-the-2018-proxy-season/> [<https://perma.cc/7H4F-PGEJ>] (reporting several successful shareholder resolutions requiring fossil fuel multinationals to make commitments related to climate change).

20. See Madison Condon, *Externalities and the Common Owner*, 95 WASH. L. REV. 1, 3–6 (2020) (presenting a persuasive argument for the shift from a firm-centric to a portfolio-oriented governance approach among widely diversified institutional investors).

21. See *infra* Part I.B.

22. See generally ALBERT O. HIRSCHMAN, *EXIT, VOICE, AND LOYALTY: RESPONSES TO DECLINE IN FIRMS, ORGANIZATIONS, AND STATES* (1970) (discussing the range of options open to members of a deteriorating organization, from staying and trying to effect change from within to leaving and joining another, better organization).

23. 1200+ *Divestment Commitments*, GOFOSSILFREE, <https://web.archive.org/web/20211021015336/https://gofossilfree.org/divestment/commitments>. Some participants limit their commitment to divestment of a subset of fossil fuel companies, such as the coal industry, continuing to invest in other fossil assets. See, e.g., *infra* note 144 and accompanying text, explaining the exit of Stanford University’s endowment from coal but not oil and gas.

investors.²⁴ These and other limitations,²⁵ including the failure to engage retail investors, prevent the divestment movement from turning financial markets into a full-blown battlefield in the war on carbon.

Part Two makes the conceptual case for corporate climate ratings to promote more carbon-sensitive asset allocation on capital markets. Recent advances in behavioral economics, consumer psychology, and related fields have produced a veritable “behavior change revolution.” Subtle changes to the decision environment, or nudges,²⁶ have enabled stakeholders to overcome biases and other cognitive limitations, resulting in welfare-enhancing choices across a wide range of contexts, from healthier food selection²⁷ to greater retirement savings.²⁸ This Article posits that ratings of corporate climate risk and governance can help overcome existing

24. See ATIF ANSAR ET AL., STRANDED ASSETS PROGRAMME, STRANDED ASSETS AND THE FOSSIL FUEL DIVESTMENT CAMPAIGN: WHAT DOES DIVESTMENT MEAN FOR THE VALUATION OF FOSSIL FUEL ASSETS? 70 (2013); see also Randall Morck et al., *The Stock Market and Investment: Is the Market a Sideshow?*, 1990 BROOKINGS PAPERS ON ECON. ACTIVITY, no. 2, at 207 (contending that “liquidity . . . [is one of] the fundamental determinants of stock values”); Robert Schwarz, *Reinvesting After Divesting: A Few Fossil-Fuel-Free Options*, 6 J. ENV’T INVESTING, no. 1, 2015, at 43 (noting that money divested from fossil fuel companies and reinvested in banks will very likely end up funding such companies again); ALISON KIRSCH ET AL., RAINFOREST ACTION NETWORK, BANKING ON CLIMATE CHANGE: THE FOSSIL FUEL FINANCE REPORT 2020, at 10–12 (2020) (criticizing the sustained growth in funding for fossil fuel ventures from the world’s largest banks). But see Truzaar Dordi & Olaf Weber, *The Impact of Divestment Announcements on the Share Price of Fossil Fuel Stocks*, SUSTAINABILITY, June 2019, at 11–14 (offering empirical evidence of short-term depressions in stock prices for fossil fuel companies following divestment events).

25. See *infra* Part I.C.

26. Nobel Laureate Richard Thaler and co-author Cass Sunstein, the founders of the nudge movement, define the term as “any aspect of the choice architecture that alters people’s behavior in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates.” RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 6 (2008); see also On Amir & Orly Lobel, *Stumble, Predict, Nudge: How Behavioral Economics Informs Law and Policy*, 108 COLUM. L. REV. 2098, 2100 (2008) (distinguishing “gentle nudges” from “forceful shoves”).

27. See, e.g., L. R. Skov et al., *Choice Architecture as a Means To Change Eating Behaviour in Self-Service Settings: A Systematic Review*, 14 OBESITY REV. 187 (2013) (examining the use of such nudges as “health labelling,” “manipulating the plate and cutlery size,” “assortment manipulation,” and “payment option manipulation”); David R. Just & Brian Wansink, *Better School Meals on a Budget: Using Behavioral Economics and Food Psychology To Improve Meal Selection*, 24 CHOICES 1 (2009) (applying behavioral economics to influence healthier cafeteria purchasing decisions).

28. See, e.g., WILLIAM G. GALE ET AL., AUTOMATIC: CHANGING THE WAY AMERICA SAVES (2009) (proposing automatic enrollment of employees in 401(k) plans with options to opt out or alter investment decisions); RICHARD H. THALER, MISBEHAVING: THE MAKING OF BEHAVIORAL ECONOMICS 309–22 (2015) (examining the use of behavioral economics in automatic enrollment and “Save More Tomorrow” saving plans).

information asymmetries and nudge investors toward more climate-conscious investment choices with similarly welfare-enhancing effects.

Our proposal for corporate climate ratings builds on the well-established system of bond ratings for financial markets.²⁹ For more than a century, Standard & Poor's, Moody's, and other rating agencies have collected, analyzed, and translated a wide swath of complex information into a simple, intuitively framed letter-grade rating of creditworthiness for bonds and companies.³⁰ Our proposed ratings of corporate climate risk and governance mimic this approach by gathering and analyzing information on a company's greenhouse gas emissions, its exposure to and management of physical and transitional climate risks, as well as related opportunities. The resulting company-specific assessments empower investors to include climate-related risks and opportunities in their decision-making process, for the dual benefit of improving the return on their investments and redirecting the flow of capital toward more climate-friendly assets.

Unlike novel requirements for financial disclosure and other well-meaning reform proposals, corporate climate ratings are attainable in the here and now, without the need for government authorization or other forms of market-distorting regulatory intervention.³¹ Private ordering efforts to collect information on corporate climate risk and governance are already underway, as evidenced by the voluntary reporting of climate-related information by thousands of companies.³² Corporate climate ratings would translate this and other information into a clear and concise assessment of companies' climate risks and performance. The dramatic rise of privately managed retirement savings accounts and online brokerages, meanwhile, provides an opening for climate-conscious employers and online trading platforms to include corporate climate ratings among the performance metrics that guide investor choices. If Robinhood traders can make or break companies like Hertz or GameStop, and bring down entire hedge funds in the process,³³ imagine what their collective energy could do to boost investment in low-carbon, climate-friendly assets.

29. See *infra* Part II.A.

30. See GILBERT HAROLD, BOND RATINGS AS AN INVESTMENT GUIDE: AN APPRAISAL OF THEIR EFFECTIVENESS 5–19 (1938) (discussing the historical roots of bond ratings prompted by the transition from relational lending to publicly traded debt instruments).

31. See *infra* Part II.B.

32. See *Companies Scores*, CDP, <https://www.cdp.net/en/companies/companies-scores> [<https://perma.cc/6BGQ-6GXC>]; see also Virginia Harper Ho, *Nonfinancial Risk Disclosure and the Costs of Private Ordering*, 55 AM. BUS. L.J. 407, 410 (2018) (explaining how the lack of regulatory requirements for reporting climate-related information has produced a surge in private ordering efforts, including private governance, self-regulation, and voluntary regulation).

33. See *infra* notes 243–245 and accompanying text.

The Biden administration's commitment to climate action and its control over Congress place a price on carbon, the historically elusive silver-bullet policy favored by economists, into the realm of possibility.³⁴ A U.S. carbon tax or cap-and-trade regime would, however, apply to only a fraction of global greenhouse gas emissions, inviting companies to move their carbon-intensive operations offshore, resulting in the relocation rather than reduction of their greenhouse gas emissions. Comprehensive corporate climate ratings enable investors to see through these and other circumvention strategies, thereby enhancing the real-world reach and impact of carbon pricing policies—in the United States and beyond.³⁵

From a political economy perspective, corporate climate ratings can create much needed common ground amidst the growing political polarization over climate change. As scientific consensus around the causes and effects of climate change continues to solidify, the question of how to respond to the climate crisis divides Democrats and Republicans more than ever.³⁶ Political science posits that the American public's partisan divide over global warming is driven by divergent views on the appropriate role, and size, of government.³⁷ If the political controversy over climate action is, indeed, yet another symptom of the age-old conflict between advocates of big government and market fundamentalism, then corporate climate ratings may point the way toward common ground.³⁸ Studies have repeatedly shown that, whatever their general disagreement over regulatory interventions, Democrats and Republicans alike overwhelmingly support the use of informational nudges on high-profile policy issues.³⁹

Part Three offers empirical evidence of the capacity of corporate climate ratings to nudge retail investors toward more climate-friendly decision-making. We conducted a series of incentivized survey experiments with over

34. *But see* Isobel Asher Hamilton, *Elon Musk Said the Biden Administration Rejected His Idea of a Carbon Tax as "Too Politically Difficult"*, BUS. INSIDER (Feb. 15, 2021), <https://www.businessinsider.com/elon-musk-carbon-tax-biden-administration-rejected-tesla-spacex-2021-2> [<https://perma.cc/7ESW-B569>].

35. *See infra* Part II.C.

36. *See* Riley E. Dunlap et al., *The Political Divide on Climate Change: Partisan Polarization Widens in the U.S.*, 58 ENV'T, no. 5, 2016, at 6–14; Elaine Kamarck, *The Challenging Politics of Climate Change*, BROOKINGS (Sept. 23, 2019), <https://www.brookings.edu/research/the-challenging-politics-of-climate-change/> [<https://perma.cc/V56Z-P5E9>].

37. *See, e.g.*, NAOMI ORESKES & ERIK M. CONWAY, *MERCHANTS OF DOUBT: HOW A HANDFUL OF SCIENTISTS OBSCURED THE TRUTH ON ISSUES FROM TOBACCO SMOKE TO GLOBAL WARMING 6* (2010) (recounting EPA findings that were accused of being “distorted by a political agenda to expand government control over all aspects of our lives”).

38. *See infra* Part I.D.

39. *See, e.g.*, Cass R. Sunstein, *Do People Like Nudges?*, 68 ADMIN. L. REV. 177, 187 (2016) (presenting survey data on the bipartisan approval of recent nudge campaigns).

fifteen hundred participants to test whether and how the inclusion of a climate rating among the performance metrics displayed to investors affects their choice of stocks. Our data provide strong evidence for the existence of a climate ratings effect on investor decision making.⁴⁰ Drawing on insights from behavioral economics and finance, we further tested and compared how different rating formats bear on investor choices.⁴¹ Our findings enable us to offer initial recommendations for the implementation of corporate climate ratings and to identify avenues for future research.⁴²

I. CURRENT EFFORTS TO MOBILIZE FINANCIAL MARKETS IN THE WAR ON CARBON—A CRITICAL ASSESSMENT

From a macroeconomic perspective, virtually all climate policy seeks to enlist the help of financial markets to achieve its objectives. Policymakers offer tax breaks and other incentives to solar, wind, and other low-carbon renewables in the hope that their public policy support will leverage private investment.⁴³ Economists endorse carbon pricing because of its twofold impact on firm behavior and capital investment. In the near term, a carbon tax or cap-and-trade regime requires producers to internalize the cost of their emissions, thereby penalizing pollution and encouraging abatement.⁴⁴ Over time, this direct, static effect will be complemented by a more indirect, dynamic effect of promoting increased investment in refinement of existing, and development of new, abatement technologies.⁴⁵ The importance of such macroeconomic effects notwithstanding, this section adopts a more microeconomic perspective to focus on initiatives seeking to catalyze greater climate action on financial markets by targeting behavior at the level of individual firms and investors. These initiatives include the Task Force on Climate-Related Financial Disclosures,⁴⁶ shareholder climate activism led by Climate Action 100+,⁴⁷ and the movement for fossil fuel divestment.⁴⁸ All three deserve credit for drawing attention to the critical role that capital

40. See *infra* Part III.B.

41. See *infra* Part I.C.

42. See *infra* Part I.D.

43. See generally Felix Mormann, *Beyond Tax Credits: Smarter Tax Policy for a Cleaner, More Democratic Energy Future*, 31 YALE J. ON REGUL. 303, 319–24 (2014) (discussing the interplay between capital markets and tax credits for renewable energy).

44. See Atanas Kolev & Armin Riess, *Environmental and Technology Externalities: Policy and Investment Implications*, 12 EIB PAPERS, no. 2, 2007, at 137 (discussing the impact of environmental policy on capital investment and technology innovation).

45. See *id.*

46. See *infra* Part I.A.

47. See *infra* Part I.B.

48. See *infra* Part I.C.

markets as well as the companies and investors they connect have to play in the war on carbon. But none has yet managed to sour the love affair between financial markets and fossil fuels.

A. *The Task Force on Climate-Related Financial Disclosures*

Policymakers and scholars have long recognized the paramount importance of accurate information for the proper functioning of capital markets.⁴⁹ In the words of the SEC, “[I]nvestors must have access to accurate information important to making investment and voting decisions in order for the financial markets to function effectively.”⁵⁰ All over the world, securities regulators require, in some form or other, disclosure of information deemed relevant to market participants.⁵¹ As more frequent and more severe extreme weather events continue to demonstrate the financial risks associated with climate change,⁵² investors increasingly demand the inclusion of climate-related risk in corporate disclosures.⁵³ But national regulators have been slow to respond.

49. See, e.g., Frank H. Easterbrook & Daniel R. Fischel, *Mandatory Disclosure and the Protection of Investors*, 70 VA. L. REV. 669, 670 (1984) (“The dominating principle of securities regulation is that anyone willing to disclose the right things can sell or buy whatever he wants at whatever price the market will sustain.”); Walter Werner, *The SEC as a Market Regulator*, 70 VA. L. REV. 755, 755 (1984) (“[S]ecurities laws . . . seek to provide investors with the information needed to trade intelligently in markets free of fraud and other abuse.”).

50. Business and Financial Disclosure Required by Regulation S-K, 81 Fed. Reg. 23,916, 23,921 (Apr. 22, 2016).

51. See Paul G. Mahoney, *Mandatory Disclosure as a Solution to Agency Problems*, 62 U. CHI. L. REV. 1047, 1047 (1995) (“Firms that issue securities in the public markets must provide affirmative disclosures about the securities and the issuer. This is true not only in the United States, but in most developed countries.”). For a foundational comparative inquiry illustrating the deep historical roots of mandatory disclosure laws across the globe, see Friedrich Kessler, *The American Securities Act and Its Foreign Counterparts: A Comparative Study*, 44 YALE L.J. 1133 (1935) (comparing disclosure requirements under U.S., German, English, and French law, among others).

52. See, e.g., Russell Gold, *PG&E: The First Climate-Change Bankruptcy, Probably Not the Last*, WALL ST. J. (Jan. 18, 2019), <https://www.wsj.com/articles/pg-e-wildfires-and-the-first-climate-change-bankruptcy-11547820006> [<https://perma.cc/JPU9-BKUN>]; see also CHRISTOPHER WATTS, ECONOMIST: INTEL. UNIT, *THE COST OF INACTION: RECOGNISING THE VALUE AT RISK FROM CLIMATE CHANGE 2* (Brian Gardner ed., 2015) (estimating the value of financial assets at risk from climate change by 2100 at \$43 trillion).

53. See, e.g., Wasim, *supra* note 6, at 1337 (“[I]nvestors are beginning to realize the potential impacts of climate change on corporate financial value and are demanding more accurate and insightful information from companies.”).

The SEC, for example, has not addressed the disclosure of climate-related risk since its 2010 interpretive guidance.⁵⁴ The Commission identified four domains within its existing Regulation S-K⁵⁵ that may require disclosures related to climate change—description of business, legal proceedings, risk factors, and management’s discussion and analysis of financial condition and results of operations.⁵⁶ The guidance goes on to list four sample scenarios of climate-relevant issues that companies may need to consider for disclosure—legislation and regulation such as a national cap-and-trade regime, international accords like the Kyoto Protocol, extreme weather events and other physical impacts of climate change, as well as indirect consequences of regulation or business trends.⁵⁷

In the immediate aftermath of the 2010 guidance, Wall Street’s top regulator issued nearly fifty comment letters to companies assessing the adequacy of their climate-related disclosures.⁵⁸ But the initial enthusiasm for enforcement dissipated quickly with only three letters in 2012 and none in 2013.⁵⁹ In its 2016 Regulation S-K Concept Release, the Commission raised questions about sustainability reporting that promised a follow-up and, perhaps, tightening of the 2010 guidance.⁶⁰ That promise, however, has yet to materialize as the Commission’s subsequent rulemaking proposals related to Regulation S-K all but ignored climate-related disclosures.⁶¹ In October

54. See Commission Guidance Regarding Disclosure Related to Climate Change, 75 Fed. Reg. 6290 (Feb. 8, 2010). The Commission did not issue its interpretative guidance on a whim but, rather, in response to a series of petitions from large institutional investors and investor groups. See *id.* at 6291 n.20.

55. 17 C.F.R. § 229. Regulation S-K lays out the standard instructions for disclosure under the Securities Act of 1933, 15 U.S.C. §§ 77a–aa, and the Securities Exchange Act of 1934, 15 U.S.C. §§ 78a–qq.

56. Commission Guidance Regarding Disclosure Related to Climate Change, 75 Fed. Reg. at 6293–95.

57. *Id.* at 6295–97.

58. See David Gelles, *S.E.C. Is Criticized for Lax Enforcement of Climate Risk Disclosure*, N.Y. TIMES (Jan. 23, 2016), <https://nyti.ms/1Vglovz> [<https://perma.cc/W2E9-U5C7>].

59. *Id.*

60. See Sec. & Exch. Comm’n, Concept Release on Business and Financial Disclosure Required by Regulation S-K (Apr. 13, 2016), <https://www.sec.gov/rules/concept/2016/33-10064.pdf> [<https://perma.cc/2Q6T-UU4U>].

61. See Modernization of Regulation S-K Items 101, 103, 105 (proposed Aug. 23, 2019); Sec. & Exch. Comm’n, Proposed Rule on Management’s Discussion and Analysis, Selected Financial Data, and Supplementary Financial Information (Jan. 30, 2020), <https://www.sec.gov/rules/proposed/2020/33-10750.pdf> [<https://perma.cc/NPC4-7HJJ>]; see also Allison Herren Lee, “Modernizing” Regulation S-K: Ignoring the Elephant in the Room, U.S. SEC. & EXCH. COMM’N (Jan. 30, 2020), <https://www.sec.gov/news/public-statement/lee-mds-2020-01-30> [<https://perma.cc/KTA8-WG25>] (noting that the latest proposal “is most notable for what it does not do: make any attempt to address investors’ need for standardized disclosure on

2020, the SEC issued the first significant revisions to Regulation S-K in over thirty years but, once again, refused to reform the requirements for disclosure of climate-related risk.⁶² Enforcement through comment letters that address the adequacy of companies' climate change-related disclosures, meanwhile, has practically disappeared.⁶³ This steadfast refusal to engage with the challenges and opportunities of climate disclosure stands in stark contrast to a recent report issued by the Commodity Futures Trading Commission, sounding a clarion call for more decisive action by regulators and markets alike to measure, understand, and address climate-related risks to the U.S. financial system.⁶⁴

At the international level, the G20 Finance Ministers and Central Bank Governors responded to growing concerns over the financial impact of climate change by asking the Financial Stability Board to review how the financial sector can take account of climate-related issues.⁶⁵ The Board, in

climate change risk"); Jill E. Fisch, *Making Sustainability Disclosure Sustainable*, 107 GEO. L.J. 923, 929, 956 (2019) (responding to the lack of SEC guidance with a proposal requiring a "Sustainability Discussion and Analysis" to be included in annual reports to shareholders).

62. See generally Modernization of Regulation S-K Items 101, 103, and 105, 85 Fed. Reg. 63,726 (Oct. 8, 2020) (codified at 17 C.F.R. pts. 229, 239, 240). In its final rule, the SEC went to great lengths to explain why, despite comments and requests to incorporate climate change in its disclosure requirements, the Commission chose not to incorporate it, emphasizing the "principles-based nature of Item 101(c)." *Id.* at 63,734, 63,736–37.

63. See Mindy Lubber, *Comments on the Climate Risk Disclosure Act of 2019*, HARV. L. SCH. F. ON CORP. GOVERNANCE (July 18, 2019), <https://corpgov.law.harvard.edu/2019/07/18/comments-on-the-climate-risk-disclosure-act-of-2019/> [<https://perma.cc/9TFY-JP2G>] ("A search for SEC comment letters asking issuers to improve their climate-related disclosure in Commission filings reveals only one such letter from January 2017 to [July 2019] . . ."); see also Andrew Ramonas, *SEC's Lee Looks To Avoid 'Gotcha' Enforcement on ESG Reporting*, BLOOMBERG L. (June 7, 2021), <https://news.bloomberglaw.com/securities-law/secs-lee-looks-to-avoid-gotcha-enforcement-on-esg-reporting> [<https://perma.cc/4HQL-BDNY>] (commenting that companies should receive notice to adjust their actions to conform with SEC regulations).

64. See *Managing Climate Risk in the U.S. Financial System*, COMMODITY FUTURES TRADING COMM'N 1 (Sept. 9, 2020) (urging that "U.S. financial regulators must recognize that climate change poses serious emerging risks to the U.S. financial system" while clarifying that "the financial system can itself be a catalyst for investments that accelerate economic resilience and the transition to a net-zero emissions economy"); see also Virginia Harper Ho, *Modernizing ESG Disclosure*, U. ILL. L. REV. (forthcoming 2022) (proposing a combination of principles-based and prescriptive approaches to improve disclosure of climate risk). For evidence of the SEC's growing interest in climate disclosure under the Biden administration, see *infra* Part II.

65. See Press Release 91/2015, Fin. Stability Bd., FSB To Establish Task Force on Climate-Related Financial Disclosures (Dec. 4, 2015), <https://www.fsb.org/2015/12/fsb-to-establish-task-force-on-climate-related-financial-disclosures/> [<https://perma.cc/E98H-MRF3>]. Composed of the G20 members' national banks, the International Monetary Fund, and The World Bank, among other high-profile financial institutions, the Financial Stability Board seeks to promote international financial stability by coordinating national financial authorities and international

turn, created the industry-led Task Force on Climate-Related Financial Disclosures instructed to “develop voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to lenders, insurers, investors and other stakeholders.”⁶⁶ Following a process of stakeholder engagement and consultation, the Task Force released its final recommendations in June 2017, urging companies to make climate-related disclosures in their “mainstream (i.e., public) annual financial filings.”⁶⁷ Substantively, the Task Force recommended that companies disclose their climate-related governance; the impacts of climate change on their business, strategy, and financial planning; their approach to managing climate risk; and the underlying metrics used to assess and manage relevant climate-related risks and opportunities.⁶⁸ To help companies evaluate their resilience to climate change in the face of uncertainty, the recommendations encourage organizations to analyze (and disclose) their exposure to climate risk along a range of potential global warming scenarios.⁶⁹

The Task Force’s recommendations have been well received. By early 2020, more than 1000 global organizations had declared their support for the Task Force and its recommendations.⁷⁰ Hailing from 55 different countries, supporters include national governments, government ministries, central banks, regulators, stock exchanges and credit rating agencies, as well as nearly 500 financial firms managing assets worth some \$140 trillion.⁷¹ By comparison, the recommendations’ direct targets have been slow to declare their love, with corporate supporters of the recommendations totaling less than \$12 trillion in market capitalization.⁷²

The tepid corporate response to the recommendations reveals a deeper agency problem.⁷³ Investors, including the hundreds of financial firms

standard-setting bodies. *See also* *About the FSB*, FIN. STABILITY BD., <https://www.fsb.org/about/> [<https://perma.cc/35C9-XQFA>].

66. Press Release 91/2015, Fin. Stability Bd., *supra* note 65; *see also* *About Us*, SUSTAINABILITY ACCT. STANDARDS BD., <https://www.sasb.org/about/> [<https://perma.cc/7453-U5VA>] (discussing a similarly framed effort to improve the quality and consistency of environmental risk disclosure).

67. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, FIN. STABILITY BD., RECOMMENDATIONS OF THE TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES 1, 17 (2017).

68. *Id.* at 14.

69. *Id.* at 25.

70. *See* Press Release, Task Force on Climate-Related Fin. Disclosures, *supra* note 15.

71. *Id.*

72. *Id.*

73. *See* Mahoney, *supra* note 51, at 1048 (highlighting the “ubiquity and importance” of agency problems in corporate law and acknowledging disclosure as to reduce the cost of monitoring managers’ use of corporate assets for self-interested purposes); *see also* Gabriel

supporting the Task Force's work, crave better information on how companies assess and manage climate-related risk.⁷⁴ In a recent survey of institutional investors, the majority of respondents rated climate-related risk reporting as important as traditional financial reporting, while nearly one third of investors considered climate reporting to be even more important.⁷⁵ But companies are reluctant to share that information.

For its latest status report, the Task Force on Climate-Related Financial Disclosures reviewed the financial reporting of over 1,700 companies spanning 69 countries and 8 industries.⁷⁶ While the Task Force notes an increase in climate-related disclosures since 2016, the report criticizes that the overall percentage of companies disclosing climate-related information remains low.⁷⁷ Another survey of the world's 2,500 largest companies reports over one third of companies failing to make any disclosures of climate-related risk.⁷⁸

Importantly, even those companies that issue disclosures might do little to help investors and other stakeholders assess the company's sensitivity to threats and opportunities resulting from global climate change. In its 2020 status report, the Task Force on Climate-Related Financial Disclosures lamented that only one in 15 companies disclosed information on the resilience of its strategy based on various global warming scenarios.⁷⁹ Others criticize the growing trend to disclose climate-related information in "vague boilerplate terms that are unhelpful to investors who seek a serious evaluation

Rauterberg & Eric Talley, *Contracting Out of the Fiduciary Duty of Loyalty: An Empirical Analysis of Corporate Opportunity Waivers*, 117 COLUM. L. REV. 1075–83 (2017) (offering an insightful account of one such self-interested use and resulting agency problems).

74. See, e.g., Gabriel T. Rubin, *Show Us Your Climate Risks, Investors Tell Companies*, WALL ST. J. (Feb. 28, 2019), <https://www.wsj.com/articles/show-us-your-climate-risks-investors-tell-companies-11551349800> [<https://perma.cc/5YP2-XA4F>]; Ans Kolk et al., *Corporate Responses in an Emerging Climate Regime: The Institutionalization and Commensuration of Carbon Disclosure*, 17 EUR. ACCT. REV. 719, 720–21 (2008) (“[B]usiness is under increasing pressure from investors and environmental non-governmental organizations (NGOs) to disclose information related to their GHG emissions.”).

75. Emirhan Ilhan et al., *Institutional Investors' Views and Preferences on Climate Risk Disclosure*, EUR. CORP. GOVERNANCE INST. 1, 4 (2019).

76. TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, FIN. STABILITY BD., 2020 STATUS REPORT 1, 9 (2020).

77. *Id.* at 8 (“Disclosure of climate-related financial information . . . increased, on average, . . . by six percentage points between 2017 and 2019. However, companies' disclosure of the potential financial impact of climate change on their businesses, strategies, and financial planning is low.”).

78. See TRUCOST ESG, *supra* note 16, at 2.

79. See TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, *supra* note 76, at 12 (criticizing that disclosures are made primarily in sustainability reports, rather than in financial filings or annual reports).

of the risks posed by a shifting climate.”⁸⁰ According to a recent survey by McKinsey & Company, “[I]nvestors say they cannot readily use companies’ sustainability disclosures to inform investment decisions”⁸¹ Specifically, investors demand more and better disclosure of climate-related and other sustainability information that are material to the company’s financial performance.⁸²

There is cause for cautious optimism. In November 2021, the Technical Readiness Working Group that unites the Task Force on Climate-Related Financial Disclosures with other standard-setting organizations from around the world published prototypical reporting standards for corporate climate and sustainability disclosures.⁸³ The Task Force’s persistent activism appears to have stirred the pot sufficiently to place climate-related disclosure on the agenda of financial regulators and policymakers around the world. The Bank of England, for example, plans to use its 2021 biennial exploratory scenario to conduct a climate stress test for banks, insurers, and the financial system.⁸⁴ The European Union recently reached political consensus among the European Parliament and the E.U. Member States on new rules for disclosure requirements related to sustainability risks, including those related to climate change.⁸⁵ In its latest financial system review, the Bank of Canada added

80. Wasim, *supra* note 6, at 1334 & n. 115 (citing the example of Molson Coors Brewing Company informing investors via its 2015 10-K report that “climate change and water availability may negatively affect our business and financial results”); *see also* Irene Monasterolo et al., *Vulnerable Yet Relevant: The Two Dimensions of Climate-Related Financial Disclosure*, 145 CLIMACTIC CHANGE 495, 495 (2017) (“[T]he current lack of concise and comparable measures of portfolios’ exposure to climate risk fails to provide major investors with the full incentives to reallocate their portfolios.”).

81. Sara Bernow et al., *More than Values: The Value-Based Sustainability Reporting that Investors Want*, MCKINSEY & CO. 1, 2 (July 2019); *see also* Christine Robinson et al., *Sustainability Disclosure Goes Mainstream*, DELOITTE: HEADS UP, Sept. 24, 2019, at 1, 3 (noting that the lack of standardized investor-grade information prevents integration of climate and other sustainability information into the decision-making process).

82. Bernow et al., *supra* note 81, at 5.

83. *See* TECH. READINESS WORKING GRP., IFRS FOUND., CLIMATE-RELATED DISCLOSURES PROTOTYPE (2021), <https://www.ifrs.org/content/dam/ifrs/groups/trwg/trwg-climate-related-disclosures-prototype.pdf> [<https://perma.cc/X8LC-DUQK>].

84. *See* BANK OF ENG., THE 2021 BIENNIAL EXPLORATORY SCENARIO ON THE FINANCIAL RISKS FROM CLIMATE CHANGE: A DISCUSSION PAPER 1 (2019), <https://www.bankofengland.co.uk/paper/2019/biennial-exploratory-scenario-climate-change-discussion-paper> [<https://perma.cc/X56U-DMCN>]; *Key Elements of the 2021 Biennial Exploratory Scenario: Financial Risks from Climate Change*, BANK OF ENG. (June 8, 2021), <https://www.bankofengland.co.uk/stress-testing/2021/key-elements-2021-biennial-exploratory-scenario-financial-risks-climate-change> [<https://perma.cc/BL2Z-DP32>].

85. *See* Johannes Bahrke & Letizia Lupini, *Capital Markets Union: Commission Welcomes Agreement on Sustainable Investment Disclosure Rules*, EUR. COMM’N (Mar. 7, 2019), https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1571 [<https://perma.cc/S8PD-5ADF>].

climate change to its list of key economic risks facing the country's financial system.⁸⁶ Earlier this year, the government of New Zealand introduced legislation to make climate-related disclosures mandatory for certain companies.⁸⁷

In the United States, legislation on climate-related disclosures has yet to materialize. The Climate Disclosure Act of 2019, championed by Senator Elizabeth Warren, sought to require issuers of securities to annually disclose information regarding climate change-related risks, including their strategies and actions to mitigate these risks, but died in committee.⁸⁸ The 2021 Corporate Governance Improvement and Investor Protection Act, requiring disclosure of certain environmental, social, and governance (ESG) metrics, passed the House of Representatives but its approval by the Senate is doubtful.⁸⁹ Absent new legislation, climate-related disclosures remain subject to the generic standard of “materiality” that the Supreme Court established more than 30 years ago.⁹⁰ In *Basic, Inc. v. Levinson*, the Court ruled that federal securities law requires publicly traded companies to disclose material facts.⁹¹ The Court went on to clarify that, to satisfy its materiality standard, “there must be a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of information made available.”⁹² Considering the high stakes, the deliberately open-ended *Levinson* standard, and the evolving profile of the “reasonable investor,”⁹³ it comes as no surprise that the Supreme Court's materiality test is heavily debated and litigated.⁹⁴ The resulting legal

86. See STEPHEN S. POLOZ ET AL., BANK OF CAN., FINANCIAL SYSTEM REVIEW SUMMARY—2019, at 1, 28–30 (2019), <https://www.bankofcanada.ca/2019/05/fsr-summary-2019/> [<https://perma.cc/K5K3-PC26>].

87. *Mandatory Climate-Related Disclosures*, MINISTRY OF BUS., INNOVATION & EMP., <https://www.mbie.govt.nz/business-and-employment/business/regulating-entities/mandatory-climate-related-disclosures/> (last updated May 25, 2021).

88. Climate Risk Disclosure Act of 2019, H.R. 3623, 116th Cong. § 5(2) (2020); see also Climate Change Financial Risk Act of 2019, S. 2903, 116th Cong. (2019) (proposing to require financial institutions to conduct climate-risk management by scenario analysis).

89. Corporate Governance Improvement and Investor Protection Act of 2021, H.R. 1187, 117th Cong. (2021).

90. See EVA SU & NICOLE VANATKO, CONG. RSCH. SERV., IF11307, CLIMATE-RELATED RISK DISCLOSURE UNDER U.S. SECURITIES LAWS 1 (2019).

91. See *Basic, Inc. v. Levinson*, 485 U.S. 224, 232 (1988).

92. *Id.* at 231–32 (quoting *TSC Indus., Inc. v. Northway, Inc.*, 426 U.S. 438, 449 (1976)).

93. See *id.* at 240 (“[M]ateriality depends on the significance the reasonable investor would place on the withheld or misrepresented information.”). As investors increasingly consider climate and other sustainability risk in their decision-making, some urge a rethinking of the “reasonable investor’s” profile. See Wasim, *supra* note 6, at 1336–38.

94. See Jeffrey A. Smith et al., *The SEC's Interpretive Release on Climate Change Disclosure*, 4 CARBON & CLIMATE L. REV. 147, 148 (2010).

uncertainty, exacerbated by the lack of leadership from the SEC,⁹⁵ harms companies and investors alike. To be clear, uncertainty has not stopped plaintiffs from suing publicly traded companies for failing to disclose or misrepresenting their climate-related risk. But most such suits are filed under state law, not federal law.⁹⁶

Taking stock, the Task Force on Climate-Related Financial Disclosures deserves great credit for drawing widespread attention to important issues surrounding the financial reporting and disclosure of climate risk. Empirical evidence, however, suggests that corporate reporting practices are slow to change as financial regulators hesitate to turn the Task Force's recommendations into legal requirements. Even the minority of companies that include climate-related information in their financial reporting rarely do so in the decision-useful format promoted by the Task Force.⁹⁷ Investors, asset managers, and other stakeholders will likely have to wait a while longer before they can base their investment choices on precise and reliable climate-related disclosures. In the meantime, capital flows freely in the wrong direction and emissions continue to rise, exacerbating global climate change.⁹⁸ Already, experts worry that “the time required for the [Task Force's] framework to mature to a point necessary to produce the consistent, quality information required to effectively drive both market and firm behaviour will exceed the short time society has to act to mitigate the worst impacts of climate change.”⁹⁹

B. Shareholder Activism: Climate Action 100+

Climate activists secured a landmark victory at Chevron's 2020 annual meeting when 53% of voting shareholders supported a resolution calling on the oil giant to align its climate-policy lobbying—both directly and indirectly

95. See Sec. & Exch. Comm'n, *supra* note 61 and accompanying text; Peter Reali et al., *2020 Proxy Season Preview*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Apr. 27, 2020), <https://corpgov.law.harvard.edu/2020/04/27/2020-proxy-season-preview/> [<https://perma.cc/S4AT-FP8V>] (“[T]he U.S. lags its global peers, and policy changes recently enacted by the Securities and Exchange Commission (SEC) will likely create new impediments for shareholders, specifically investors, focused on ESG initiatives.”).

96. See, e.g., *Massachusetts v. Exxon Mobil Corp.*, 462 F. Supp. 3d 31 (D. Mass. 2020) (suing under Massachusetts' Consumer Protection Act); *People by James v. Exxon Mobil Corp.*, 119 N.Y.S.3d 829 (N.Y. Sup. Ct. 2019) (suing, unsuccessfully, under New York's Martin Act). *But see* *Ramirez v. Exxon Mobil Corp.*, 334 F. Supp. 3d 832, 839 (N.D. Tex. 2018) (suing under the Federal Securities Act of 1933 and Securities Exchange Act of 1934).

97. See generally TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, *supra* note 4, at 1, 3, 76 (explaining the decision-useful format).

98. See Statement from Robert B. Litterman, *supra* note 11, at 1.

99. Edwards et al., *supra* note 17, at 589.

through membership in trade associations—with the Paris Climate Agreement’s goal of keeping global warming under two degrees Celsius.¹⁰⁰ Chevron is not the first oil and gas major to succumb to mounting shareholder pressure on climate issues. In December 2018, Royal Dutch Shell issued a joint statement with investors announcing emissions reduction targets of 20% by 2035 and 50% by 2050 to decrease the company’s net carbon footprint, including emissions from the sale of its products.¹⁰¹

Shareholder climate activism has been on the rise since the 2017 proxy season.¹⁰² The year 2018 witnessed a series of successful shareholder resolutions, including two requiring fossil fuel heavyweights Kinder Morgan and Anadarko Petroleum to report on their preparations for a two degree Celsius scenario.¹⁰³ The number of environmental and social shareholder proposals, including those related to climate change, have steadily grown from 44% in 2016 to 66% of all proposals in 2020.¹⁰⁴ With mounting public pressure and climate activism gaining momentum on Wall Street, more and more resolutions do not even go to a vote but end up being withdrawn following board acquiescence to shareholder demands instead.¹⁰⁵ Many of these climate-related shareholder proposals originate with Climate Action 100+.

In late 2017, at the two-year anniversary of the Paris Climate Agreement, some 200 institutional investors joined forces to launch Climate Action 100+.¹⁰⁶ As of late 2021, the initiative unites some 615 investors managing

100. See Rachel Koning Beals, *For First Time Ever, Majority of Shareholders Push Oil Giant Chevron To Align with Paris Climate Pact*, MARKETWATCH (June 24, 2020), <https://www.marketwatch.com/story/for-first-time-ever-majority-of-shareholders-push-oil-giant-chevron-to-align-with-paris-climate-pact-2020-06-23> [https://perma.cc/QME8-D5WV]; Paris Agreement to the United Nations Framework Convention on Climate Change, *adopted* Dec. 12, 2015, T.I.A.S. No. 16-1104 (explaining that following ratification by 55 countries accounting for at least 55% of global greenhouse gas emissions, the Paris Agreement entered into force on November 4, 2016, less than a year after its adoption).

101. See Joint Statement Between Institutional Investors on Behalf of Climate Action 100+ and Royal Dutch Shell PLC 1, 2 (Dec. 3, 2018), https://www.shell.com/media/news-and-media-releases/2018/joint-statement-between-institutional-investors-on-behalf-of-climate-action-and-shell/_jcr_content/par/textimage_d010.stream/1543782013771/767edfadfd44d01e425d68a17fd5a1fd24f4f32b/03-dec-2018-joint-statement-institutional-investors-and-shell.pdf [https://perma.cc/8S2U-2W84].

102. See James R. Copland & Margaret O’Keefe, *Climate-Change Proposals Break Through*, PROXY MONITOR (2017), <https://www.proxymonitor.org/Forms/2017Finding1.aspx> [https://perma.cc/7HFD-RCYW].

103. Westcott, *supra* note 19.

104. Reali et al., *supra* note 95.

105. Condon, *supra* note 20, at 4.

106. Sarah Rundell, *Investors Launch Climate Action 100+*, TOP1000FUNDS.COM (Dec. 19, 2017), <https://www.top1000funds.com/2017/12/investors-launch-climate-action-100/>

assets worth over \$60 trillion in their commitment to engage companies to curb emissions, improve governance, and strengthen climate-related disclosures.¹⁰⁷ Members include Harvard University Endowment and other university endowments; some of the world's largest pension funds, such as those of California, Japan, and the Netherlands; as well as many of the most influential non-pension institutional investors, including BlackRock, BNP Paribas, HSBC, and JPMorgan.¹⁰⁸

Since its inception, Climate Action 100+ has targeted systemically important greenhouse gas emitters and other companies across the global economy that have significant opportunities to drive the clean energy transition and help achieve the goal of the Paris Agreement.¹⁰⁹ In 2018, the initial list of 100 target companies, representing up to two-thirds of global industrial greenhouse gas emissions, was complemented by a second “+” list adding another 61 companies, identified based on their risk exposure to and their potential to help mitigate climate change.¹¹⁰ In addition to shareholder resolutions, the members of Climate Action 100+ seek to engage target companies through one-on-one meetings, investor roundtables, and other informal channels.¹¹¹ In its 2020 Progress Report, Climate Action 100+ claims credit for emissions reduction commitments from dozens of high-profile multinationals, including ArcelorMittal, British Petroleum, Cemex, Duke Energy, Ford Motor Company, PetroChina, Qantas Airways, and Unilever.¹¹²

Shareholder activism has been a fixture of U.S. corporate governance since 1942, when the SEC adopted Rule 14a-8, requiring companies to put shareholder resolutions to a vote.¹¹³ Pension funds and other institutional investors have been active participants in the governance of their holdings

[<https://perma.cc/N6Q7-VYXT>]. A similar initiative with overlapping membership launched in late 2020 with the stated objective “to galvanise the asset management industry to commit to a goal of net zero emissions.” NET ZERO ASSET MANAGERS INITIATIVE, <https://www.netzeroassetmanagers.org/> [<https://perma.cc/D7NH-79CP>].

107. *About Climate Action 100+*, CLIMATE ACTION 100+, <http://www.climateaction100.org/about> [<https://perma.cc/FD6P-UDAG>].

108. *See Investor Signatories*, CLIMATE ACTION 100+, <http://www.climateaction100.org/whos-involved/investors/> [<https://perma.cc/WM9P-PLC3>].

109. *See Companies*, CLIMATE ACTION 100+, <http://www.climateaction100.org/whos-involved/companies/> [<https://perma.cc/4B47-KSHM>].

110. *See How We Got Here*, CLIMATE ACTION 100+, <https://www.climateaction100.org/approach/how-we-got-here/> [<https://perma.cc/J456-JQKV>].

111. CLIMATE ACTION 100+, 2019 PROGRESS REPORT 1, 15 (2019).

112. *See CLIMATE ACTION 100+*, 2020 PROGRESS REPORT, 1, 7, 24, 32, 70, 79, 80 (2020).

113. *See* 17 C.F.R. § 240.14a-8 (1942).

since the 1980s.¹¹⁴ The latest wave of climate-related activism, however, differs from previous iterations in both its unprecedented rate of success and the shareholders' underlying motivation.

Historically, shareholder resolutions related to climate change and the environment more generally have stood out primarily for their “[d]ismal passage rates.”¹¹⁵ Prior to 1975, most environmentally oriented shareholder proposals failed to receive even the minimum 3% of votes required for a proposal to be refiled the following year.¹¹⁶ The twelve climate-related proposals voted on during the 2001 and 2002 proxy seasons received, on average, less than 15% of votes.¹¹⁷ In light of these humble beginnings, the recent successes of climate shareholder activism, with some resolutions receiving nearly 60% of votes, is all the more impressive.¹¹⁸

The boost in shareholder support for climate-related proposals is likely the product of a variety of factors, including the heightened sense of urgency brought about by more frequent and more severe extreme weather events caused by global climate change.¹¹⁹ In a recent article, Professor Madison Condon makes a compelling case that another, underappreciated driver of shareholders' newfound love for climate activism may be a paradigm shift in the approach of institutional investors to corporate governance.¹²⁰

114. See Stuart L. Gillan & Laura T. Starks, *Corporate Governance Proposals and Shareholder Activism: The Role of Institutional Investors*, 57 J. OF FIN. ECON. 275, 278–79 (2000); for a snapshot of the challenges and controversies surrounding the rise of shareholder activism by institutional investors, see also Roberta Romano, *Public Pension Fund Activism in Corporate Governance Reconsidered*, 93 COLUM. L. REV. 795 (1993); Bernard S. Black, *Agents Watching Agents: The Promise of Institutional Investor Voice*, 39 UCLAL. REV. 811 (1992); John C. Coffee Jr., *Liquidity Versus Control: The Institutional Investor As Corporate Monitor*, 91 COLUM. L. REV. 1277 (1991); Ronald J. Gilson & Reinier Kraakman, *Reinventing the Outside Director: An Agenda for Institutional Investors*, 43 STAN. L. REV. 863 (1991); Lucian A. Bebchuk & Scott Hirst, *Index Funds and the Future of Corporate Governance: Theory, Evidence, and Policy*, 119 COLUM. L. REV. 2029 (2019).

115. Erin M. Reid & Michael W. Toffel, *Responding to Public and Private Politics: Corporate Disclosures of Climate Change Strategies*, 30 STRATEGIC MGMT. J. 1157, 1160 (2009).

116. Emma Sjöström, *Shareholder Activism for Corporate Social Responsibility: What Do We Know?*, 16 SUSTAINABLE DEV. 141, 145 (2008).

117. See Anastasia O'Rourke, *A New Politics of Engagement: Shareholder Activism for Corporate Social Responsibility*, 12 BUS. STRATEGY & ENV'T 227, 230 (2003).

118. See, e.g., Westcott, *supra* note 19 (highlighting the 59.7% approval rate of a shareholder resolution at Kinder Morgan's annual meeting, calling on the company to report on its preparations for a two-degree Celsius scenario).

119. See BEVERE ET AL., *supra* note 2 and accompanying text; EMILIO GRANADOS FRANCO ET AL., WORLD ECON. F., THE GLOBAL RISKS REPORT 6 (2020) (“Climate change is striking harder and more rapidly than we expected.”).

120. See Condon, *supra* note 20, at 6 (arguing that the climate activism of institutional investors is motivated by their desire to protect economy-mirroring portfolios from the risks and

The traditional account of shareholder activism suggests that institutional investors flex their muscles on environmental issues for one of two reasons: they want to either (a) impose social norms they or their constituents hold dear, at the possible expense of firm profitability¹²¹ or (b) increase firm profits by remedying a flaw in the managers' business and regulatory strategy.¹²² The latest rounds of shareholder climate activism suggest that the traditional account requires amendment to incorporate a third possible reason—the goal of maximizing profits “at a *portfolio* rather than a *firm* level.”¹²³

Following the tenet of modern portfolio theory,¹²⁴ most institutional investors have diversified their assets broadly across the stock market in an attempt to mirror the economy.¹²⁵ As “universal owners,” Professor Condon persuasively argues, these investors have a strong financial incentive to advance corporate governance that will “mitigate climate change risks and damages to their economy-mirroring portfolios”—even if this climate activism hurts the bottom line of individual firms in their investment portfolio.¹²⁶ A recent statement from over seventy institutional investors managing assets worth over \$4.5 trillion lends empirical support to this new, portfolio-oriented paradigm of shareholder climate activism.¹²⁷ In their statement, signatory investors call on investee companies to align their

damages of climate change). For an account of the enabling phenomenon of horizontal shareholding, see Einer Elhauge, *Horizontal Shareholding*, 129 HARV. L. REV. 1267 (2016); Yaron Nili, *Horizontal Directors*, 114 NW. U. L. REV. 1179 (2020) (discussing the related proliferation of directors serving on multiple corporate boards).

121. See, e.g., Einer Elhauge, *Sacrificing Corporate Profits in the Public Interest*, 80 N.Y.U. L. REV. 733, 759 (2005) (pointing out that “corporations that sacrifice profits to comply with social and moral norms” tend to have their stock prices driven down even by sympathetic investors).

122. See, e.g., John Byrd & Elizabeth S. Cooperman, *Shareholder Activism for Stranded Asset Risk: An Analysis of Investor Reactions for Fossil Fuel Companies*, INT'L REV. ACCT., BANKING & FIN., Spring 2017, at 60 (suggesting the possibility of a carbon bubble due to board overvaluation of fossil fuel stocks in light of unburnable reserves and other stranded assets).

123. Condon, *supra* note 20, at 5.

124. See generally Harry Markovitz, *Portfolio Selection*, 7 J. FIN. 77 (1952) (establishing the theoretical framework for portfolio diversification as a means of reducing variance and, thus, risk). See also Mark Rubinstein, *Markowitz's "Portfolio Selection": A Fifty-Year Retrospective*, 57 J. FIN. 1041, 1042 (2002) (“Through diversification, risk can be reduced (but not generally eliminated) without changing expected portfolio return.”).

125. See Brian Bushee, *Identifying and Attracting the “Right” Investors: Evidence on the Behavior of Institutional Investors*, J. APPLIED CORP. FIN., Fall 2020, at 29, 31 (classifying 61% of institutional investors as “quasi-indexers” that hold broadly diversified investment portfolios with little turnover, “similar to an index strategy”).

126. Condon, *supra* note 20, at 5–6.

127. See SEAN ALLEN ET AL., PRINCIPLES FOR RESPONSIBLE INV., CONVERGING ON CLIMATE LOBBYING: ALIGNING CORPORATE PRACTICE WITH INVESTOR EXPECTATIONS 8 (2018).

lobbying and policy engagement with the goal of a safe climate to protect “the long-term value in our portfolios across all sectors and asset classes.”¹²⁸

Recognizing financial motives, rather than social norms, as the driving force behind the recent surge in shareholder climate activism has important implications. From a doctrinal perspective, the objective of maximizing profits at the portfolio level explains why institutional investors are overcoming their historical reluctance to take a more active role in the governance of their portfolio companies. According to the literature’s traditional narrative, institutional investors are deterred from greater activism by the agency costs they would absorb, while any benefits would spill over to all of the target company’s shareholders.¹²⁹ When the prospective gains of climate activism are considered at the portfolio level, however, accruing across a multitude of holdings for diversified investors, they are much more likely to outweigh the costs of shareholder stewardship.

This profit rationale behind institutional investors’ climate activism bodes well for the movement’s longevity. Boards and directors change, along with the political beliefs and social norms they hold dear, yet the corporate objective of profit maximization remains. But the underlying cost-benefit calculus is firm- and portfolio-specific and subject to change, casting doubt on the ability of Climate Action 100+ and similar initiatives to scale.

It is easy to see why shareholder activism pushing climate policy at top emitters like ExxonMobil and Chevron—jointly responsible for a staggering 3.3% of global greenhouse gas emissions¹³⁰—pays enough dividends for the climate-sensitive holdings in an investor’s portfolio to outweigh the attendant agency costs.¹³¹ But what happens after fossil fuel majors succumb to shareholder pressure and restructure their business, selling off some of their contested upstream operations? So long as there is strong global demand for

128. *Id.*

129. See, e.g., Lucian Bebchuk, *The Agency Problems of Institutional Investors*, 31 J. ECON. PERSPS. 89, 90 (2017) (noting that institutional investor activists generally capture only a small fraction of the benefits flowing from their activism while bearing the full costs); Edward B. Rock, *The Logic and (Uncertain) Significance of Institutional Shareholder Activism*, 79 GEO. L.J. 445, 452 (1991) (“What interferes with the realization of the optimists’ hope—the hope that institutional investors will be as active, informed, and skeptical as individuals holding an equivalent stake—are the agency costs.”).

130. See PAUL GRIFFIN, *THE CARBON MAJORS DATABASE: CDP CARBON MAJORS REPORT 14* (2017).

131. Drawing on Nobel Laureate William Nordhaus’s acclaimed modeling of climate change’s economic impacts, Professor Condon offers a back-of-the-envelope calculation for BlackRock’s cost-benefit analysis, pitting firm-level losses of \$6 billion from forcing emissions reductions by Exxon and Chevron against \$10 billion in damages from climate change that these emission reductions would avert from the remainder of BlackRock’s portfolio. See Condon, *supra* note 20, at 46–47.

oil, gas, and other fossil fuels, competitive markets will find buyers for these assets.¹³² Only now ownership of these oil and gas wells or coal mines is no longer concentrated in the hands of a few, heavily scrutinized corporate giants but, rather, spread across a multitude of smaller-sized ventures. Aggregate emissions from these assets may not have changed but the individual carbon footprint of their corporate owners is significantly smaller. As a result, the costs of a shareholder activist campaign have increased, relative to their purported emissions reductions, and may no longer be outweighed by the benefits, even when measured at portfolio scale.¹³³

This hypothetical illustrates another, related challenge for scaling climate activism based on financial motives. Even without ownership dispersion, the cost-benefit calculus of climate activism will become less appealing as investors continue to work through the list of Climate Action 100+ target companies. The costs of engagement will remain roughly the same but engaging companies with smaller carbon footprints that promise lower emissions reductions translates to fewer benefits for institutional investors' portfolio companies.

A less extreme, but no less likely, scenario is that the momentum of shareholder climate activism slows down, perhaps as a function of targeting less and less controversial companies. The 2020 proxy season, for example, did not deliver nearly the same success as previous years for resolutions sponsored by Climate Action 100+.¹³⁴ Proposals requesting that companies separate the roles of CEO and board chair to drive the strategic transformation to succeed in a carbon-constrained world failed at Dominion Energy,¹³⁵ Duke Energy,¹³⁶ ExxonMobil,¹³⁷ and Southern Company, the latter receiving less

132. See *infra* note 153 and accompanying text (describing the liquidity of fossil fuel markets).

133. For an illustrative account of institutional investors' sensitivity to agency costs in the context of corporate governance, see Ronald J. Gilson & Jeffrey N. Gordon, *The Agency Costs of Agency Capitalism: Activist Investors and the Revaluation of Governance Rights*, 113 COLUM. L. REV. 863 (2013).

134. See *2020 Score Card, PROXY MONITOR*, <https://www.proxymonitor.org/ScoreCard2020.aspx> [<https://perma.cc/P4UF-X828>].

135. See *Separate Chair/CEO (D, 2020 Resolution)*, CERES, https://engagements.ceres.org/ceres_engagementdetailpage?recID=a011H00000CiuIQAR [<https://perma.cc/JF5P-NQ6B>].

136. See *Separate Chair/CEO (DUK, 2020 Resolution)*, CERES, https://engagements.ceres.org/ceres_engagementdetailpage?recID=a011H00000CiuJQAR [<https://perma.cc/ESL5-TLKF>].

137. See *Separate Chair/CEO (XOM, 2020 Resolution)*, CERES, https://engagements.ceres.org/ceres_engagementdetailpage?recID=a011H00000BZKMQA5 [<https://perma.cc/WT67-ZSC7>].

than a quarter of votes.¹³⁸ Lobbying-related resolutions fared only slightly better, with majority support at Chevron’s annual meeting but rejections from the shareholders of Caterpillar, Duke Energy, ExxonMobil, Delta Airlines, United Airlines, General Motors, and Ford Motor Company, the latter earning barely 20% of votes.¹³⁹ Time will tell to what extent this loss of momentum was a temporary symptom of the COVID-19 pandemic and whether success rates are poised to pick up again for shareholder climate activism.¹⁴⁰ A one-in-twelve ratio of success is all but certain to affect the expectation value that institutional investors assign to climate activism going forward.¹⁴¹ Once that expectation value falls below the costs of engagement, institutional investors may increasingly revert back to their old “rationally reticent” position on shareholder activism.¹⁴² Such a reversal back to more passive shareholding is especially likely for trustees of federally regulated pension funds and other asset managers whose fiduciary duties require a reasonable expectation that their engagement will enhance the value of their investment stake, net of attendant costs.¹⁴³

138. See *Separate Chair/CEO (SO, 2020 Resolution)*, CERES, https://engagements.ceres.org/ceres_engagementdetailpage?recID=a011H00000Ciu1TQAR [<https://perma.cc/24LC-UAUY>].

139. See *Climate Action 100+ Investor Signatories Achieve Major Gains During 2020 U.S. Proxy Season*, CLIMATE ACTION 100+, <https://www.climateaction100.org/news/climate-action-100-investor-signatories-achieve-major-gains-during-2020-u-s-proxy-season-2/> [<https://perma.cc/R772-ZU3X>]; *Report on Lobbying (F, 2020 Resolution)*, CERES, https://engagements.ceres.org/ceres_engagementdetailpage?recID=a011H00000BZQXiQAP [<https://perma.cc/UR6J-7YP4>].

140. At the time of writing, the 2021 proxy season was in full flight, with preliminary results offering inconclusive evidence. For example, climate-related shareholder resolutions passed at Chevron, ConocoPhillips, Delta Airlines, and United Airlines but failed to garner a majority of votes at Berkshire Hathaway, United Parcel Service, Xcel Energy, and Wal-Mart. See *2021 Score Card*, PROXY MONITOR, <https://www.proxymonitor.org/ScoreCard2021.aspx> [<https://perma.cc/LVY4-4CLY>].

141. We use the term “success” here in reference to the vote on a specific shareholder proposal related to climate risk and governance but acknowledge that proposals may change corporate policy even without formal adoption at a company’s annual meeting. See, e.g., Yonca Ertimur et al., *Board of Directors’ Responsiveness to Shareholders: Evidence from Shareholder Proposals*, 16 J. CORP. FIN. 53, 54 (2010) (presenting evidence that some 40% of shareholder proposals were later adopted by boards, despite having failed to garner majority approval at the annual meeting); see also Jie Cai et al., *Electing Directors*, 64 J. FIN. 2389, 2391 (2009) (finding that, while directors are rarely removed by voting, low vote totals tend to reduce CEO compensation and increase turnover).

142. See Gilson & Gordon, *supra* note 133, at 867.

143. See Max M. Schanzenbach & Robert H. Sitkoff, *Reconciling Fiduciary Duty and Social Conscience: The Law and Economics of ESG Investing by a Trustee*, 72 STAN. L. REV. 381, 444–48 (2020) (explaining the limits that trust law imposes on a trustee’s shareholder activism based on climate-related and other environmental factors).

C. The Movement for Fossil Fuel Divestment

In 2014, Stanford University made global headlines with the decision to divest its multi-billion-dollar endowment of all stock in coal-mining companies, citing coal's contribution to global climate change as motivation for the purge.¹⁴⁴ Stanford was the first major university to join a movement launched in late 2012 with the "Do the Math" campaign of climate activist Bill McKibben's 350.org platform.¹⁴⁵ From its humble roadshow beginnings, the campaign for divestment of fossil fuels has grown into a global movement, joined by a wide range of name-brand institutional investors, including pension funds,¹⁴⁶ sovereign wealth funds,¹⁴⁷ philanthropic foundations,¹⁴⁸ educational institutions,¹⁴⁹ and faith-based organizations.¹⁵⁰ As of October 2021, more than 1,300 such institutional investors representing

144. See Michael Wines, *Stanford To Purge \$18 Billion Endowment of Coal Stock*, N.Y. TIMES (May 6, 2014), <https://nyti.ms/1kUEGpI> [<https://perma.cc/7YLT-SQTM>]; Ed Crooks, *Stanford Endowment Votes To Sell Coal Mining Shares*, FIN. TIMES (May 6, 2014), <https://www.ft.com/content/7259b7ec-d566-11e3-adec-00144feabdc0> [<https://perma.cc/ZUQ8-P89X>].

145. The math in McKibben's call to action was based on the insight that limiting global warming to acceptable levels would require burning no more than one-fifth of the then-known fossil fuel reserves. See *Do the Math Tour: We're Jumpstarting a New Movement, and We Need Your Help*, 350.ORG, <https://math.350.org> [<https://perma.cc/9ZA7-F7H2>].

146. See, e.g., Jamie Smyth, *Australian Pension Fund LGS Drops Coal Assets*, FIN. TIMES (Oct. 6, 2014), <https://www.ft.com/content/20d5a1ae-4dd1-11e4-9683-00144feab7de> [<https://perma.cc/LKF5-5WWF>]; Madison Marriage, *Norway's Largest Pension Fund Vows To Drop Coal Mine Holdings*, FIN. TIMES (Nov. 23, 2014), <https://www.ft.com/content/ab7b785e-716e-11e4-b178-00144feabdc0> [<https://perma.cc/VA6V-DSLML>]; Charles Daly, *Sweden's \$37 Billion AP1 Pension Fund Divests from Fossil Fuels*, BLOOMBERG MKTS. (Mar. 16, 2020), <https://www.bloomberg.com/news/articles/2020-03-16/sweden-s-37-billion-ap1-pension-fund-divests-from-fossil-fuels> [<https://perma.cc/7CER-D2QE>].

147. See, e.g., Rob Davies, *Norway's \$1tn Wealth Fund To Divest from Oil and Gas Exploration*, GUARDIAN (Mar. 8, 2019), <https://www.theguardian.com/world/2019/mar/08/norways-1tn-wealth-fund-to-divest-from-oil-and-gas-exploration> [<https://perma.cc/VTE3-E8SD>].

148. See, e.g., Michael Calia, *Rockefeller Fund Seeks To Shed Fossil-Fuel Investments*, WALL ST. J. (Sept. 22, 2014), <https://www.wsj.com/articles/rockefeller-fund-seeks-to-shed-fossil-fuel-investments-1411398675> [<https://perma.cc/5XDQ-7343>] (noting the irony that the Rockefellers' fortune was built largely on oil investments).

149. See, e.g., Libby Brooks, *Glasgow Becomes First University in Europe To Divest from Fossil Fuels*, GUARDIAN (Oct. 8, 2014), <https://www.theguardian.com/environment/2014/oct/08/glasgow-becomes-first-university-in-europe-to-divest-from-fossil-fuels> [<https://perma.cc/C8ZL-NV5H>].

150. See, e.g., Adam Vaughan, *World Council of Churches Rules Out Fossil Fuel Investments*, GUARDIAN (July 11, 2014), <https://www.theguardian.com/environment/2014/jul/11/world-council-of-churches-pulls-fossil-fuel-investments> [<https://perma.cc/YE8F-UDSF>].

close to \$15 trillion in capital around the world have committed to divestment of some, if not all, of their fossil fuel holdings.¹⁵¹

But the divestment movement is not uncontroversial. Critics such as Microsoft founder and noted philanthropist Bill Gates question the net effect of divestment on carbon emissions: “Divestment, to date, probably has reduced about zero tones of emissions. It’s not like you’ve capital-starved the people making steel and gasoline.”¹⁵² The scholarly community has voiced similar concerns over the impact of divestment on the valuation of affected stocks, noting that the size of the global financial market and the liquidity of most fossil fuel stocks help any divested holdings quickly find their way to other, less concerned investors.¹⁵³ Others criticize that the divestment movement’s focus on extractive and energy companies, while media-effective, fails to recognize the systemic, economy-wide interconnections—from supply to consumption—that shape overall greenhouse gas emissions.¹⁵⁴ Such a myopic approach, critics contend, misrepresents the complex push-and-pull dynamic across the value chain of energy and other carbon-relevant products or services.¹⁵⁵

Many proponents highlight the moral argument underlying divestment over the movement’s actual impact on companies, markets, and emissions.¹⁵⁶

151. See *1200+ Divestment Commitments*, *supra* note 23. Some participants limit their commitment to divestment of a subset of fossil fuel companies, such as the coal industry, continuing to invest in other fossil assets. See, e.g., *supra* note 144 and accompanying text (explaining the Stanford endowment’s exit from coal, but not oil and gas).

152. Andrew Edgecliffe-Johnson & Billy Nauman, *Fossil Fuel Divestment Has ‘Zero’ Climate Impact, Says Bill Gates*, FIN. TIMES (Sept. 17, 2019), <https://www.ft.com/content/21009e1c-d8c9-11e9-8f9b-77216ebe1f17> [<https://perma.cc/UQW3-5GY3>].

153. See ANSAR ET AL., *supra* note 24, at 70; Randall Morck et al., *supra* note 24, at 207 (contending that “liquidity . . . [is one of] the fundamental determinants of stock values”); Schwarz, *supra* note 24, at 43 (noting that money divested from fossil fuel companies and reinvested in banks will very likely end up funding such companies again); Paul Brest et al., *How Investors Can (and Can’t) Create Social Value*, 44 J. CORP. L. 205, 210 (2018) (noting that it is “virtually impossible” for socially conscious investment, and divestment, to affect the “behavior of firms whose securities trade in public markets”); Schanzenbach & Sitkoff, *supra* note 143, at 399 (“[C]apital lost to a firm from a [divestment] strategy employed by even a large number of [investors] will tend to be replaced by other capital that rushes in to take advantage of the opportunity.”). But see Dordi & Weber, *supra* note 24, at 11–14 (offering empirical evidence of short-term depressions in stock prices for fossil fuel companies following divestment events).

154. See Sibylle Braungardt et al., *Fossil Fuel Divestment and Climate Change: Reviewing Contested Arguments*, 50 ENERGY RSCH. & SOC. SCI. 191, 195 (2019).

155. See *id.*

156. In the Rockefeller Brothers Fund’s announcement to divest, for example, chair Valerie Rockefeller Wayne stressed the “moral obligation” to withdraw financial support from carbon-polluting industries. Suzanne Goldenberg, *Rockefeller Brothers Fund: It Is Our Moral Duty To*

Others view divestment as “a process of delegitimising” the fossil fuel sector and its “odious profits.”¹⁵⁷ This morally-informed narrative makes the divestment movement a “norm entrepreneur” that draws on social norms to change public perception and opinion, in this case about climate change, its contributors, and its mitigation.¹⁵⁸ The moral overtone appears to have struck a nerve, as evidenced by frequent comparisons to other morally framed divestment campaigns, such as the anti-Apartheid or tobacco boycotts.¹⁵⁹ Some commentators acknowledge that the divestment movement has revitalized the environmental discourse in certain countries, prompting novel demands from investors and creating new conversations among financiers.¹⁶⁰ Others muse whether the divestment movement can create sufficient public support to carry international agreements and more effective national climate policies.¹⁶¹

Occasional moral victories and a strong media presence notwithstanding, the divestment movement has failed to convert financial markets into a full-blown battlefield in the war on carbon—due to three critical limitations.¹⁶² First, by drawing a binary divestment line between fossil and non-fossil stocks, the movement fails to properly differentiate among companies—on both sides of the divide—based on their relative contributions to global warming and climate change. Second, the movement’s focus on institutional investors ignores the market reality that retail investors control a majority of equities in the United States and elsewhere. Third, investors receive little, if any, guidance on how to reinvest funds freed up by divestment of fossil fuel stocks.

Painting with too broad a brush and lumping all fossil fuel companies together can produce perverse incentives that impede rather than promote effective climate action. Consider two competing fossil fuel companies:

Divest from Fossil Fuels, GUARDIAN (Mar. 27, 2015), <https://www.theguardian.com/environment/2015/mar/27/rockefeller-fund-chairman-moral-duty-divest-fossil-fuels> [<https://perma.cc/WXV9-YQMQ>].

157. Adam Vaughan, *Fossil Fuel Divestment: A Brief History*, GUARDIAN (Oct. 8, 2014), <https://www.theguardian.com/environment/2014/oct/08/fossil-fuel-divestment-a-brief-history> [<https://perma.cc/FMV7-AYRC>] (citing author and climate activist Naomi Klein).

158. See Braungardt et al., *supra* note 154, at 192.

159. See, e.g., Chelsie Hunt et al., *A Comparative Analysis of the Anti-Apartheid and Fossil Fuel Divestment Campaigns*, 7 J. SUSTAINABLE FIN. & INV. 64 (2017).

160. See, e.g., Noam Bergman, *Impacts of the Fossil Fuel Divestment Movement: Effects on Finance, Policy and Public Discourse*, 10 SUSTAINABILITY 2540 (2018).

161. See Neil Gunningham, *Building Norms from the Grassroots Up: Divestment, Expressive Politics, and Climate Change*, 39 L. & POL’Y 372, 387–88 (2017).

162. The critique presented here expands on ideas and arguments first articulated in Felix Mormann, *Why the Divestment Movement Is Missing the Mark*, 10 NATURE CLIMATE CHANGE 1067 (2020).

Company A adheres to business as usual, using the revenue from its extractive activities to fund development of new oil and gas wells. Company B also operates in the upstream oil and gas business but, unlike its competitor, uses part of its revenue to fund research on biofuels from algae and powers its operations with electricity from low-carbon renewable sources.¹⁶³ While stylized, this hypothetical illustrates the industry reality that, when it comes to emissions and climate change, not all oil companies are created equal. According to a recent report, Repsol, Royal Dutch Shell, and Total have the most comprehensive plans for greenhouse gas reduction among oil-and-gas companies, while also leading the pack in terms of their commitment to renewables.¹⁶⁴ Yet, the divestment movement shuns these more emissions-sensitive and climate-conscious companies exactly the same as their more polluting, business-as-usual competitors.

The same lack of differentiation applies to non-fossil fuel companies who are exempt from divestment, regardless of their relative contribution to the greenhouse gas emissions that drive global climate change. As stated earlier, emission-intensive firms are not found only in the fossil fuel and energy industries. The manufacture and processing of aluminum, for example, is well known for its enormous energy intensity and, hence, its potential carbon footprint.¹⁶⁵ The majority of these carbon emissions typically come from the electricity required for aluminum electrolysis.¹⁶⁶ A manufacturer using coal-fired electricity would, therefore, emit orders of magnitude more greenhouse gases than a competitor powered by low-carbon electricity from solar, wind, or nuclear. Once again, however, the divestment movement would treat both firms alike and encourage continuing investment in both stocks.

163. If this hypothetical scenario seems far-fetched, see Anna Hirtenstein, *ExxonMobil Is Spending \$1bn a Year Researching Renewable Energy*, INDEPENDENT (Nov. 3, 2017), <https://www.independent.co.uk/news/business/news/exxonmobil-renewable-energy-research-oil-company-development-biofuels-algae-electricity-a8035496.html> [<https://perma.cc/E5NR-CWNW>] (describing ExxonMobil's research commitment to alternative forms of energy from algae-engineered biofuels to cells that turn emissions into electricity); Carolyn Fortuna, *Should We Cheer? ExxonMobil's Renewable Energy Commitments Are in the News*, CLEANTECHNICA (Dec. 6, 2018), <https://cleantechnica.com/2018/12/06/should-we-cheer-exxonmobils-renewable-energy-commitments-are-in-the-news/> [<https://perma.cc/AUB7-2EUY>] (noting the irony of using renewable electricity to extract oil and gas).

164. See Allen Good, MORNINGSTAR, *Understanding the Emissions Challenge: An Assessment of Integrated Oils' Efforts To Reduce Greenhouse Gas Intensity*, STOCK STRATEGIST INDUS. REPS. (Jan. 13, 2020), <https://www.morningstar.com/articles/961748/understanding-the-emissions-challenge> [<https://perma.cc/KKV2-K4H8>].

165. See Gautam et al., *Carbon Footprint of Aluminum Production: Emissions and Mitigation*, in ENVIRONMENTAL CARBON FOOTPRINTS: INDUSTRIAL CASE STUDIES 197, 197–228 (Subramanian Senthilkannan Muthu ed., 2018).

166. *Id.* at 207.

From an asset perspective, therefore, the movement for fossil fuel divestment can be faulted for being overinclusive relative to fossil fuel assets and underinclusive as regards other assets. Empirical evidence suggests that this critique could be extended, at least in part, to the movement's investor reach. After all, the current divestment tally lists over 1,300 commitments from institutional investors representing nearly \$15 trillion in assets, compared to fewer than 60,000 commitments from individual investors barely surpassing \$5 billion.¹⁶⁷ The latter numbers reflect the divestment movement's failure to mobilize a key contingent of the global financial market—individuals who hold stocks and other securities for their personal account, commonly referred to as retail investors.

In the United States alone, retail investors directly hold over \$16 trillion of stocks, or 38% of all U.S. equities.¹⁶⁸ Counting both direct and indirect stock ownership, through mutual funds, retail investors own nearly 60% of U.S. equities, for a total value of almost \$25 trillion.¹⁶⁹ And it is not just the wealthiest 1% who own these stocks. According to the Federal Reserve Bank's triennial Survey of Consumer Finances, 68 million, or 53%, of U.S. households own stocks.¹⁷⁰ In light of these numbers, the tiny share of divestment commitments from retail investors suggests that the movement fails to engage a key segment of the financial market—one that controls almost two-thirds of U.S. stocks.¹⁷¹ This apparent lack of retail investor mobilization is problematic, both from an asset perspective and for the divestment movement's stated mission to delegitimize the fossil fuel industry in the court of public opinion and thereby spur more widespread support for climate action.¹⁷²

The overwhelming focus on institutional investors is further problematic because it ignores legal barriers to divestment. Asset managers for pension funds, charitable trusts, and other institutions subject to U.S. trust law, for example, would likely struggle to reconcile wholesale divestment from fossil

167. See *1200+ Divestment Commitments*, *supra* note 23.

168. See KATIE KOLCHIN, SIFMA, SIFMA INSIGHTS: Q: WHO OWNS STOCKS IN AMERICA? A: INDIVIDUAL INVESTORS 14 (2019).

169. *Id.* When adding indirect stock ownership through Exchange Traded Funds, the overall equity holdings of U.S. retail investors rise even further. *Id.* at 14, 20.

170. See Neil Bhutta et al., *Changes in U.S. Family Finances from 2016 to 2019: Evidence from the Survey of Consumer Finances*, 106 FED. RSRV. BULL. 18, 40 (2020).

171. These numbers explain why critics worry that divested shares quickly end up in the hands of other investors without putting much of a dent, if any, into the affected stock's market price. See *supra* note 24 and accompanying text.

172. See Bill McKibben, *Global Warming's Terrifying New Math*, ROLLING STONE (July 19, 2012), <https://www.rollingstone.com/politics/politics-news/global-warmings-terrifying-new-math-188550/> [<https://perma.cc/7USB-6CW3>]; see also Braungardt et al., *supra* note 154, at 192–93.

fuels with their fiduciary duties.¹⁷³ Outside of special rules for charities and authorization by the settlor or beneficiary in personal trusts, fossil fuel divestment would violate the sole interest rule of fiduciary trust law.¹⁷⁴ That is because eschewing an entire industry would incur diversification costs likely to hurt the trust's bottom line.¹⁷⁵ Moreover, the movement's stated goal of reducing the fossil fuel industry's access to capital, if achieved, would raise the cost of capital for fossil companies and, therefore, increase the returns from investing in these assets, turning (socially successful) divestment into a losing proposition, at least from the trust law-relevant financial perspective.¹⁷⁶ In the 1980s, the same rationale led the majority of commentators to conclude that trustees seeking to boycott the South African Apartheid regime could not divest from firms doing business in South Africa without violating their fiduciary duties.¹⁷⁷

Trust law also explains why Stanford University's endowment divested from coal, but not from other fossil fuel assets.¹⁷⁸ In keeping with their fiduciary duties, Stanford's Board of Trustees pursue a return-oriented investment strategy, except for "very rare occasions . . . when companies' actions or inactions are so abhorrent and ethically unjustifiable as to warrant the University's dissociation from those investments."¹⁷⁹ Having failed to identify such abhorrent practices among the companies in Stanford's

173. See Schanzenbach & Sitkoff, *supra* note 143, at 398–99, 442 (laying out the difference between prohibited divestment to produce collateral benefits and potentially permissible divestment for the sole purpose of increased returns).

174. See generally Robert H. Sitkoff, *Fiduciary Principles in Trust Law*, in THE OXFORD HANDBOOK OF FIDUCIARY LAW 41, 41–46 (Evan J. Criddle et al. eds., 2019) (discussing the demands of the trustee's fiduciary duties and the sole interest rule).

175. See, e.g., Dylan B. Minor, *Finding the [Financial] Cost of Socially Responsible Investing*, 16 J. INVESTING 54, 55 (2007).

176. See Schanzenbach & Sitkoff, *supra* note 143, at 398.

177. See, e.g., Richard M. Ennis & Roberta L. Parkhill, *South African Divestment: Social Responsibility or Fiduciary Folly?*, 42 FIN. ANALYSTS J. 30, 35–36 (1986) (finding that divestment from South Africa would violate the exclusive purpose test); John H. Langbein & Richard A. Posner, *Social Investing and the Law of Trusts*, 79 MICH. L. REV. 72, 88, 96 (1980); Thomas A. Troyer et al., *Divestment of South Africa Investments: The Legal Implications for Foundations, Other Charitable Institutions, and Pension Funds*, 74 GEO. L.J. 127, 149–50 (1985) ("More traditional trust law principles suggest that a trustee who approves a divestment policy breaches his or her duty of loyalty because he or she is pursuing an objective extraneous to the purposes of the trust.").

178. See *supra* note 144 and accompanying text.

179. BD. OF TRS., STAN. UNIV., STATEMENT ON INVESTMENT RESPONSIBILITY 2 (2018), <https://stanford.app.box.com/v/stmt-investment-responsibility> [<https://perma.cc/NK6R-GWNE>].

portfolio, the Trustees did “not believe that a credible case can be made for divesting from the fossil fuel industry” more broadly.¹⁸⁰

The third and final limitation lies in the movement’s focus on divestment from fossil fuel stocks with little, if any, guidance for investors on how to reinvest their funds. As Bill Gates and other critics have noted, positive investment choices that fund innovative, climate-friendly businesses are likely to have a greater impact on global greenhouse gas emissions than divestment alone.¹⁸¹ To be sure, platforms like divestinvest.org seek to guide those committed to divestment from fossil fuels toward reinvestment in more climate-friendly assets.¹⁸² The actual impact of these recommendations, however, remains unknown.¹⁸³ Moreover, any guidance is, once again, targeted at institutional investors, leaving retail investors to fend for themselves.¹⁸⁴

II. THE CASE FOR CORPORATE CLIMATE RATINGS

Disclosure of climate-related financial information, shareholder climate activism, and the divestment movement each have an important part to play in the unfolding climate finance saga. But they are unlikely to come close—individually or collectively—in reach and impact to a system of independent ratings that assess companies’ climate risk and governance. This Part makes the conceptual case for including corporate climate ratings among the performance metrics that inform investor decision making.¹⁸⁵

In April 2021, President Biden appointed Gary Gensler as new Chair of the SEC responding to calls to place the climate crisis at the top of the

180. Press Release, Bd. of Trs., Stan. Univ., Stanford and Climate Change (April 25, 2016), <https://news.stanford.edu/2016/04/25/stanford-climate-change-statement-board-trustees/> [<https://perma.cc/86ZM-5N8Y>].

181. See Edgecliffe-Johnson & Nauman, *supra* note 152 (citing Bill Gates’ investment in Beyond Meat and Impossible Foods, two alternative protein companies aiming to reduce the carbon intensity of burgers and other, traditionally meat-based foods).

182. See *About Us*, DIVESTINVEST, <https://www.divestinvest.org/about/> [<https://perma.cc/BBB5-7CG3>].

183. The DivestInvest site offers a list of participating investors and assets for download, but information is limited to divestment commitments with no actual numbers for participants’ reinvestment choices. See Spreadsheet, DIVESTINVEST, <https://www.divestinvest.org/wp-content/uploads/2019/08/2019.08.14-DivestInvest-Tally.-External.xlsx> [<https://perma.cc/2CBF-PBAC>] (providing download link).

184. See Tom Harrison, *How To DivestInvest: A Guide for Institutional Investors*, DIVESTINVEST (Feb. 21, 2018), <https://www.divestinvest.org/guide/> [<https://perma.cc/QH49-A6AP>].

185. For empirical evidence of the capacity of climate ratings to catalyze more climate-conscious investor behavior, see *infra* Part III.

Commission's agenda.¹⁸⁶ Sure enough, Wall Street's top watchdog quickly announced that a new rulemaking proposal for climate-related disclosures would be released before the year's end.¹⁸⁷ With the SEC dominated for the foreseeable future by commissioners appointed during the Trump administration,¹⁸⁸ it remains to be seen how stringent the eventual rule will be.¹⁸⁹ Whatever the rule's substantive heft, the bigger question is how long it will take for the resulting climate disclosure requirements to actually go into effect. If the Obama administration's ill-fated Clean Power Plan, the last rulemaking effort of similar importance to climate action, is any indication, any SEC rule on climate disclosure is likely to face fierce opposition and

186. See Jason Bisnoff, *Gary Gensler Confirmed as New SEC Chair as Agency Tackles GameStop Saga, ESG Boom and Cryptocurrency*, FORBES (Apr. 14, 2021), <https://www.forbes.com/sites/jasonbisnoff/2021/04/14/gary-gensler-confirmed-as-new-sec-chair-as-agency-tackles-gamestop-saga-esg-boom-and-cryptocurrency/?sh=24e6cbe16f67> [<https://perma.cc/HGZ9-B5N7>]; see also Andrew Ackerman & Dave Michaels, *Biden Is Expected To Name Gary Gensler for SEC Chairman*, WALL ST. J. (Jan. 12, 2021), <https://www.wsj.com/articles/biden-is-expected-to-name-gary-gensler-for-sec-chairman-11610487023> [<https://perma.cc/P5KA-BU9C>] (citing Senator Elizabeth Warren's demand that "[w]e need a new SEC chair who will put this climate crisis at the top of the agency's agenda").

187. See Katanga Johnson & Pete Schroeder, *U.S. SEC Chair Tells Congress He Plans New Rules on Climate Risk, Trading*, REUTERS (May 6, 2021), <https://www.reuters.com/business/us-sec-chair-pledges-trading-rules-review-first-congressional-hearing-2021-05-06/> [<https://perma.cc/BB48-6PST>].

188. Staggered five-year terms of the five commissioners enable the President to make a new SEC appointment every year. See 15 U.S.C. § 78d.

189. The SEC's partisan politics were aptly illustrated earlier this year when Commissioners Peirce and Roisman issued a public statement to openly criticize then-Acting Chair Alison Herren Lee's announcement directing the Division of Corporate Finance to enhance its focus on climate-related disclosure in public company filings. See Hester M. Peirce & Elad L. Roisman, *Enhancing Focus on the SEC's Enhanced Climate Change Efforts*, U.S. SEC. & EXCH. COMM'N (Mar. 4, 2021), <https://www.sec.gov/news/public-statement/roisman-peirce-sec-focus-climate-change> [<https://perma.cc/4CFM-DDYY>]. Opposition to ESG disclosure mandates is not limited to the SEC's inner circles. The Financial Economists Roundtable, a group of senior financial economists, recently urged the SEC not to mandate disclosure of a firm's impacts on environmental and social outcomes. See FIN. ECONOMISTS ROUNDTABLE, STATEMENT ON SEC REGULATION OF ESG ISSUES 2 (Oct. 2021), https://drive.google.com/file/d/1Ae_90xQ9iYJwZ_r8A2-XLptQGqr4nObA/view [<https://perma.cc/AD2L-SRQL>].

become the subject of protracted litigation.¹⁹⁰ In the interim, precious time will be lost.¹⁹¹

Even if meaningful SEC disclosure requirements for climate-related information are, indeed, issued and eventually enter into force, their impact on actual investment and flows of capital remains uncertain. After all, how many retail, and even institutional, investors go to the trouble of sifting through the latest SEC filings of the companies whose stock they are considering for purchase?¹⁹² Enter corporate climate ratings—a powerful tool that remedies existing information asymmetries¹⁹³ and nudges investors to make more climate-conscious choices for the dual benefit of their bottom line and better environmental stewardship.¹⁹⁴

190. See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64662 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60), implementation stayed until resolution of pending challenges per *West Virginia v. EPA*, 136 S. Ct. 1000 (2016), repealed by Affordable Clean Energy Rule, 84 Fed. Reg. 32520 (July 8, 2019) (to be codified at 40 C.F.R. pt. 60); see also Andrew Ramonas, *SEC Climate Disclosure Push Brings Corporate Lobbying Flood*, BLOOMBERG L. (May 25, 2021), <https://news.bloomberglaw.com/securities-law/sec-climate-disclosure-push-brings-corporate-lobbying-flood?context=article-related> [<https://perma.cc/HR36-LY2N>] (reporting how the U.S. Chamber of Commerce and other skeptics are lobbying the SEC to drop its climate disclosure agenda).

191. President Biden's Executive Order 14030 on Climate-Related Financial Risk underscores the urgency of better climate risk disclosure and governance. See 86 Fed. Reg. 27967 (May 20, 2021). A recent follow-up report from the White House calls for a "whole-of-government" effort to address climate-related financial risks to the United States. See THE WHITE HOUSE, U.S. CLIMATE-RELATED RISK EXECUTIVE ORDER 14030: A ROADMAP TO BUILD A CLIMATE-RESILIENT ECONOMY (Oct. 14, 2021), <https://www.whitehouse.gov/wp-content/uploads/2021/10/Climate-Finance-Report.pdf> [<https://perma.cc/U72B-G4FA>].

192. According to a recent survey, investors turn to a variety of sources, but not SEC filings, for their pre-transaction research. See Christine Sgarlata Chung, *The Devil You Know: A Survey Examining How Retail Investors Seek Out and Use Financial Information and Investment Advice*, 37 REV. BANKING & FIN. L. 653, 665 (2018).

193. The pervasive information asymmetries on capital markets related to climate change have been the subject of recent and ongoing litigation over corporations misinforming their shareholders regarding climate risks. See, e.g., *Ramirez v. Exxon Mobil Corp.*, 334 F. Supp. 3d 832, 840 (N.D. Tex. 2018); *Exxon Mobil Corp. v. Att'y Gen.*, 94 N.E.3d 786, 790 (Mass. 2018).

194. Similar informational nudges have proven highly effective in a variety of contexts, including health warnings, restaurant hygiene ratings, and food labels. See, e.g., Geoffrey T. Fong et al., *The Impact of Pictures on the Effectiveness of Tobacco Warnings*, 87 BULL. WORLD HEALTH ORG. 640 (2009) (reporting the positive health impacts of warning graphics and labels on tobacco packaging); Paul A. Simon et al., *Impact of Restaurant Hygiene Grade Cards on Foodborne-Disease Hospitalizations in Los Angeles County*, 67 J. ENV'T HEALTH 32 (2005) (reporting a 13% decrease in hospitalizations for foodborne illness following the requirement for restaurants to display their hygiene ratings); Brenna Ellison et al., *The Impact of Restaurant Calorie Labels on Food Choice: Results from a Field Experiment*, 52 ECON. INQUIRY 666 (2014) (reporting evidence of the effectiveness of graphically displayed calorie labels, accompanied by modeling projections that labels will be more effective at achieving the targeted behavioral change than either a tax on high-calorie items or a subsidy on low-calorie items).

Our proposal for rating companies' climate risk and governance expands upon the well-established system of bond ratings in financial markets. For over a century, Standard & Poor's, Moody's, and other rating agencies have gathered, analyzed, and translated a wide array of complex information into a simple, intuitively framed letter-grade rating of creditworthiness for bonds and companies.¹⁹⁵ Our proposed corporate climate ratings mimic this approach by gathering and analyzing information related to a company's greenhouse gas emissions, its management of physical and transitional climate risks, and its attendant business opportunities. The resulting company-specific assessments empower investors to include climate-related risks and opportunities in their decision-making process, to increase the returns on their investments and help redirect the flow of capital toward more climate-friendly assets.

A shared methodology with well-established credit ratings familiar to companies and investors alike lowers the barriers to widespread adoption of corporate climate ratings on capital markets.¹⁹⁶ Compared to broadly framed ratings of corporate performance along environmental, social, and governance metrics, the greater focus of climate-specific ratings fosters greater consistency across rating services and, with it, better investor information.¹⁹⁷ Unlike most other reform proposals, climate ratings are attainable in the here and now, without the need for government authorization or other forms of market-distorting regulatory intervention.¹⁹⁸ Those hoping for implementation of a federal carbon tax or cap-and-trade regime will appreciate the capacity of climate ratings to amplify the abatement incentives provided by carbon pricing policies, in the United States and beyond.¹⁹⁹ From a political economy perspective, finally, corporate climate ratings can create common ground in the increasingly polarized partisan politics surrounding climate change.²⁰⁰

A. *Building on Ratings of Creditworthiness*

Independent ratings of companies and their performance metrics have long been a staple of financial markets. Every year, rating agencies like Standard & Poor's, Moody's, and Fitch pass judgment on over \$125 trillion worth of

195. See HAROLD, *supra* note 30, at 11.

196. See *infra* Part II.A.

197. See *infra* Part II.B.

198. See *infra* Part II.C.

199. See *infra* Part II.D.

200. See *infra* Part II.E.

securities.²⁰¹ Their ratings, ranging from D (for default) to AAA (best) determine the access to and cost of capital for corporations, municipalities, national governments, and, ultimately, their citizenry.²⁰² In the words of Senator Joseph Lieberman, “credit raters . . . hold the key to capital and liquidity, . . . the lifeblood of corporate America and of our capitalist economy” and thereby “affect stock price.”²⁰³

Today’s rating agencies trace their origins back to the early 1900s, when industrial expansion increased companies’ appetite for capital beyond what they could raise via the then-prevailing system of relational finance, relying on local lenders well-acquainted with the corporations they helped fund.²⁰⁴ When capital needs could no longer be met by this system of trust established over years, if not decades, of doing business together, third-party ratings helped fill the resulting knowledge gap.²⁰⁵

Since 1973, the role of credit ratings has received growing regulatory recognition starting with the designation of select rating agencies as Nationally Recognized Statistical Ratings Organizations.²⁰⁶ The pivotal status of these agencies has since been cemented via a series of credit rating-dependent rules and regulations promulgated under the Securities Act of 1933, the Securities Exchange Act of 1934, the Investment Company Act of 1940, and a variety of other banking regulations.²⁰⁷ In response to market demand, rating agencies have continued to expand their product offerings

201. The two largest rating agencies, Moody’s and Standard & Poor’s, rated a staggering \$126 trillion of securities in 2019 alone. See *What We Do*, MOODY’S, <https://about.moody’s.io/overview> [<https://perma.cc/G8WP-A2N3>] (reporting over \$79 trillion of rated debt); S&P GLOB., 2020 INVESTOR FACT BOOK 16 (2020), <http://investorfactbook.spglobal.com/pdf-downloads/> [<https://perma.cc/4N6S-APKB>] (reporting nearly \$47 trillion of rated debt).

202. See *Rating the Raters: Enron and the Credit Rating Agencies: Hearing Before the Senate Comm. on Governmental Affairs*, 107th Cong. 116 (2002).

203. *Id.*

204. See HAROLD, *supra* note 30, at 6; Richard Sylla, *An Historical Primer on the Business of Credit Ratings*, in RATINGS, RATING AGENCIES AND THE GLOBAL FINANCIAL SYSTEM 19 (Richard M. Levich et al. eds., 2002); Richard Cantor & Frank Packer, *The Credit Rating Industry*, 5 J. FIXED INCOME 10, 10–12 (1995).

205. See TIMOTHY J. SINCLAIR, *THE NEW MASTERS OF CAPITAL: AMERICAN BOND RATING AGENCIES AND THE POLITICS OF CREDITWORTHINESS* 5 (Cornell University Press 2014) (“Rating serves a purpose in less socially embedded capital markets, where fund managers are under pressure to demonstrate they are not basing their understanding of creditworthiness of investment alternatives on implicit trust in names but use a recognized, accepted mechanism.”).

206. See Notice of Revision Proposed Amendments to Rule 153-1 under the Securities Exchange Act of 1934, Exchange Act Release No. 34-10,525, 1973 (Nov. 29, 1973) (codified as amended at 17 C.F.R. § 240.15c3-1).

207. For a detailed discussion of the regulatory recognition of and reliance on credit rating agencies in financial markets, see Frank Partnoy, *The Siskel and Ebert of Financial Markets: Two Thumbs Down for the Credit Rating Agencies*, 77 WASH U. L.Q. 619, 645–49 (1999).

beyond publicly traded debt instruments. By the beginning of the new millennium, more than three-quarters of industrial companies in the United States were rated by one or more agencies.²⁰⁸ Some agencies are showing signs of interest in potential future incorporation of climate-related risk into their rating metrics.²⁰⁹ Even if climate risk eventually becomes part of the process, however, its precise impact on the overall rating of a bond or company will remain a mystery to investors, given how zealously agencies guard their rating methodologies.²¹⁰

In the meantime, a specialized rating system for corporate climate governance is starting to take shape. The international non-profit CDP, formerly known as Carbon Disclosure Project, has initiated an annual reporting process that rates companies' and municipalities' progress and action on climate change as well as other environmental issues.²¹¹ In 2020, CDP rated over 9,600 companies and 920 cities, states, and regions, awarding letter grades from A (leadership level), B (management level), C (awareness level), D (disclosure level) to F (failure to provide sufficient information to be evaluated).²¹² Similar to the letter grades awarded by credit-rating agencies, corporate climate ratings à la CDP's can convey decision-useful information in a format familiar to markets and investors.²¹³

208. See *New Interests, New Conflicts*, ECONOMIST (Apr. 14, 2001), <https://www.economist.com/finance-and-economics/2001/04/12/new-interests-new-conflicts> [<https://perma.cc/UMA6-DJX3>] (reporting corporate rating coverage of 78% and 66% by Moody's and Standard & Poor's, respectively).

209. In 2019, Moody's acquired a majority stake in FourTwentySeven, a data provider for the assessment of climate impact and risk. See Christopher Flavelle, *Moody's Buys Climate Data Firm, Signaling New Scrutiny of Climate Risks*, N.Y. TIMES (July 24, 2019), <https://www.nytimes.com/2019/07/24/climate/moodys-ratings-climate-change-data.html> [<https://perma.cc/G27C-XZFY>].

210. Credit rating agencies have long been criticized for the "black box" nature of their rating criteria, with little, if any, gains in transparency. See, e.g., Uk Sinha, *Rating Agencies Owe the Market More Transparency*, FIN. TIMES (July 20, 2020), <https://www.ft.com/content/2a0bffc7-e925-4df8-ba9c-2bf9dda579b3> [<https://perma.cc/WL2C-8NQB>]. For a critical evaluation of reform proposals for greater transparency, see Claire A. Hill, *Why Did Rating Agencies Do Such a Bad Job Rating Subprime Securities*, 71 U. PITT. L. REV. 585, 602 (2010).

211. *What We Do*, CDP, <https://www.cdp.net/en/info/about-us/what-we-do> [<https://perma.cc/C6Y8-JRB9>].

212. *Companies Scores*, *supra* note 32 (showing, remarkably, only 273, or less than 3% of the over 9,600 companies rated earned an "A" rating for their disclosure and actions on climate change, further underscoring the need for greater mobilization of capital markets in war on carbon); see also *supra* Part I.

213. Closer to Main Street than Wall Street, a similar system of ratings for climate risk is emerging to help homebuyers assess spatially refined climate risks, such as flooding, extreme heat, and wildfires, for their real estate objects of desire. See Matthew E. Kahn, *A New Rating Industry Is Emerging To Help Homebuyers Assess Climate Risks*, CONVERSATION (Nov. 23, 2021), <https://theconversation.com/a-new-ratings-industry-is-emerging-to-help-homebuyers-assess-climate-risks-171898> [<https://perma.cc/K4V8-VKAH>].

Rating agencies and their ratings are not exempt from criticism. Disruptive events on financial markets periodically prompt calls for greater regulatory oversight and other reforms.²¹⁴ Critics have labeled rating agencies as “superpowers” that “can destroy a country by downgrading its bonds.”²¹⁵ Others contend that, based on empirical evidence, rating agencies “do a good, if not stellar, job.”²¹⁶ Whatever the correct verdict on the accuracy, transparency, and power of credit ratings, they provide a helpful blueprint for corporate climate ratings.²¹⁷ The ability to draw on the rich and colorful history of credit ratings enables CDP and other emerging raters of companies’ climate risk and governance to emulate the best practices of Moody’s and company without the need to replicate their mistakes.

B. The Comparative Benefits of Climate Ratings Over ESG Ratings

We are not the first to suggest a system of ratings for corporate performance based on environmental metrics. Over the past decade, growing investor interest in environmental, social, and governance factors has produced a flurry of ESG rating services and related investment products.²¹⁸ Today, hundreds of ESG-themed mutual funds and ESG rating services compete for the attention and money of socially conscious investors.²¹⁹ But

214. See, e.g., Hill, *supra* note 210, at 590–93 (discussing the failures of rating agencies that contributed to the sub-prime mortgage crisis and resulting reform initiatives); Claire A. Hill, *Regulating the Rating Agencies*, 82 WASH U. L.Q. 43, 82 (2004) (assessing proposals for reform of the rating industry following public outcry over its failures in the context of the Enron scandal).

215. Thomas L. Friedman, *Foreign Affairs; Don’t Mess With Moody’s*, N.Y. TIMES (Feb. 22, 1995), <https://www.nytimes.com/1995/02/22/opinion/foreign-affairs-don-t-mess-with-moody-s.html> [<https://perma.cc/4CHK-N76X>] (“[W]e live again in a two-superpower world. There is the U.S. and there is Moody’s. The U.S. can destroy a country by leveling it with bombs; Moody’s can destroy a country by downgrading its bonds.”); see also Paul Krugman, *Berating the Raters*, N.Y. TIMES (Apr. 25, 2010), <https://www.nytimes.com/2010/04/26/opinion/26krugman.html> [<https://perma.cc/L85E-TRQT>] (criticizing the conflicts of interest that undermine the accuracy and credibility of credit ratings issued in exchange for payment by the issuing entity); Partnoy, *supra* note 207, at 623, 681 (criticizing the oligopolistic market power granted to Moody’s and other credit rating agencies through regulatory licenses).

216. Hill, *supra* note 214, at 44 (“[T]here is considerable evidence that in the normal course, they [rating agencies] do a good, if not stellar, job.”).

217. It is unlikely, at least in the near term, that corporate climate ratings would wield the same power as credit ratings, especially at a time when not every investor believes in or is concerned about global warming, sea level rise, and other manifestations of climate change.

218. See, e.g., Betty Moy Huber & Michael Comstock, *ESG Reports and Ratings: What They Are, Why They Matter*, HARV. L. SCH. F. ON CORP. GOV. (July 27, 2017), <https://corpgov.law.harvard.edu/2017/07/27/esg-reports-and-ratings-what-they-are-why-they-matter/> [<https://perma.cc/VT62-4ALQ>] (surveying eight ESG rating companies, while also noting that there are too many to cover all).

219. See Schanzenbach & Sitkoff, *supra* note 143, at 431.

ratings vary dramatically, though not always transparently, in methodology, scope, and coverage, leaving investors to grapple with confusing, if not outright conflicting, information.²²⁰ Compared to ESG metrics and other, more broadly defined ratings, our proposed climate-focused ratings minimize the risk of confusing investors with divergent ratings due to methodological inconsistencies.

Consider the example of Tesla Motors, the world's leading manufacturer of electric vehicles. Transport electrification has long been identified as a cornerstone of global strategies to alleviate air pollution, reduce greenhouse gas emissions, and mitigate climate change.²²¹ One might intuit, therefore, that Tesla would ace at least the environmental component of ESG ratings.²²² Sure enough, the ESG index of MSCI, a highly regarded financial information firm, rates Tesla at the top of the auto industry.²²³ At the same time, however, FTSE, another well-respected ESG rating service, rates Tesla's environmental performance at "zero," ranking the carmaker behind Exxon in terms of sustainability.²²⁴ This striking discrepancy in the environmental scores awarded by rating services is the result of critical differences in the rater's proprietary, oft undisclosed methodologies.

The distortionary impact of methodological differences compounds as more criteria and data points factor into a rating. In the case of ESG ratings, the lack of universal definitions for all three constituent elements—environment, social, and governance—infuses the same variance observed for environmental aspects into the scoring of social and governance matters. General Motors' social engagement, for example, was rated in the top quartile by FTSE, but the bottom quartile by MSCI.²²⁵

Ratings of corporate climate risk and governance are also likely to vary, at least in the near term, as rating services develop and refine their metrics and methods. Compared to the wide swath of data points of potential relevance to ESG ratings, however, the more narrowly defined scope of

220. See Huber & Comstock, *supra* note 218.

221. See, e.g., Runsen Zhang & Shinichiro Fujimori, *The Role of Transport Electrification in Global Climate Change Mitigation Scenarios*, 15 ENV'T. RSCH. LETTERS 034019 (2020); David McCollum et al., *Transport Electrification: A Key Element for Energy System Transformation and Climate Stabilization*, 123 CLIMATIC CHANGE 651 (2014).

222. Elon Musk's idiosyncratic leadership style has hurt Tesla's governance score in many ratings. See, e.g., Kevin Curran, *ESG Investors Aren't Riding with Tesla While Elon Is Driving*, THE STREET (Mar. 22, 2019), <https://www.thestreet.com/video/esg-expert-offers-his-take-on-tesla-14904491> [<https://perma.cc/6GNH-CZDV>].

223. James Mackintosh, *Is Tesla or Exxon More Sustainable? It Depends Whom You Ask*, WALL ST. J. (Sept. 17, 2018), <https://www.wsj.com/articles/is-tesla-or-exxon-more-sustainable-it-depends-whom-you-ask-1537199931> [<https://perma.cc/QP29-URH6>].

224. *Id.*

225. *Id.*

climate ratings is likely to produce significantly less variance of outcomes. Moreover, the more focused inquiry into a company's climate risk and governance should make it easier for investors to better understand and account for the methodological choices that drive divergent rating results. Over time, these dynamics should further help foster convergence toward more consistent or, at least, more transparent rating methodologies.

C. Climate Ratings Are Attainable Here and Now

Federal law bestows valuable privileges upon securities that have received a favorable rating from Moody's, Standard & Poor's, Fitch, or another of the five Nationally Recognized Statistical Ratings Organizations.²²⁶ The extension of a similar regulatory imprimatur to CDP and other raters of corporate climate risk and governance, including their admission into the elite club of Nationally Recognized Statistical Ratings Organizations, would go a long way toward placing climate risk on center stage in the investor decision-making process. But corporate climate ratings do not require regulatory endorsement or other forms of government intervention to move the needle on climate finance in the here and now.

According to the Federal Reserve Bank's latest Survey of Consumer Finances, more than half of U.S. households own corporate equities.²²⁷ For families in the upper-middle income group and the top decile, the share of

226. Under the Securities Act of 1933, an offering of non-convertible debt or preferred stock is eligible for registration via the shortened statement Form S-3 if at least one credit-rating agency approved as a Nationally Recognized Statistical Ratings Organization has rated the security in question as investment grade. See Multijurisdictional Disclosure and Modifications to the Current Registration and Reporting System for Canadian Issuers (MJDS), Exchange Act Release No. 33-6902, 56 Fed. Reg. 30,036, 30,055, 30,106 (July 1, 1991). Under the Securities Exchange Act of 1934, Proposed Form 17-H, Risk Assessment Report for Brokers and Dealers requires that a reporting broker-dealer disclose any commercial paper rating that the firm or its affiliates has received from a Nationally Recognized Statistical Ratings Organization; Rule 10b-6 prohibits any person engaged in a distribution of securities from buying or bidding for any securities in that class until their participation in the distribution is completed. In 1983, the SEC adopted an exception from the rule for nonconvertible debt securities that, among other things, are rated investment-grade by at least one Nationally Recognized Statistical Ratings Organization. See Prohibition Against Trading by Persons Interested in a Distribution, Exchange Act Release No. 34-19,565, 48 Fed. Reg. 10,628, 10,631, 10,641 (Mar. 14, 1983). Similarly, Rule 2a-7 of the Investment Company Act of 1940, relies on ratings by Nationally Recognized Statistical Ratings Organizations to determine permissible investments for money market funds. Specifically, a rated security is an eligible investment if the required number of credit rating agencies rate it one of the two highest ratings for short term debt. See Revisions to Rules Regulating Money Market Funds, Exchange Act Release No. 33-6,882, 56 Fed. Reg. 8,113, 8,114 (Feb. 27, 1991). For further exploration of these and other regulatory privileges attached to credit ratings, see Partnoy, *supra* note 207, at 692-93, 693 nn.346-48.

227. See Bhutta et al., *supra* note 170, at 18.

stock owners rises to 70% and 90%, respectively.²²⁸ Together, these holdings account for over 60% of U.S. equities, with an aggregate value of \$25 trillion.²²⁹ Many of these retail investors hold their stock portfolio as part of a retirement savings plan, increasingly managed through online brokerage accounts.²³⁰ Retirement accounts and online brokerage platforms hold enormous opportunity for private environmental governance to promote more climate-friendly investment via corporate climate ratings.²³¹

At the end of 2018, U.S. retirement savings were valued at \$35 trillion in total assets, \$15 trillion of which were privately managed through defined contribution plans and individual retirement accounts.²³² The average value of individual retirement accounts exceeds \$250,000.²³³ Retail investors

228. *Id.* at 3, 18.

229. See Kolchin, *supra* note 168 (noting that valuation data as of 2019 suggest higher aggregate value following the stock market rally in the second half of 2020).

230. Nearly two-thirds of American households participate in structured retirement plans, such as a 401(k), defined benefit pension, or an individual retirement account (IRA). See Bhutta et al., *supra* note 170, at 20; see also PATRICK J. PURCELL, CONG. RSCH. SERV., RL31507, EMPLOYER STOCK IN RETIREMENT PLANS: INVESTMENT RISK AND RETIREMENT SECURITY 2–5 (2002) (explaining how the shift from defined benefit plans to defined contribution plans has been driven by the Employee Retirement Income Security Act of 1974 and the Revenue Act of 1978).

231. The concept of private environmental governance recognizes the critical role that private entities, from corporations to non-governmental organizations, play in addressing environmental concerns traditionally thought to be the exclusive domain of government regulation. See, e.g., Light, *supra* note 3, at 140 (“In light of the significant impact that firms can have on the environment . . . the law governing the corporation . . . should be understood as a fundamental part of environmental law.”); Michael P. Vandenberg, *Private Environmental Governance*, 99 CORNELL L. REV. 129, 133 (2013) (“[N]ew private environmental governance activities play the standard-setting, implementation, monitoring, enforcement, and adjudication roles traditionally played by public regulatory regimes.”); Jody Freeman, *The Private Role in the Public Governance*, 75 N.Y.U. L. REV. 543, 547 (2000) (“A careful inquiry into the private role in governance reveals not only its pervasiveness, but also the extent to which it operates symbiotically with public authority.”). More specifically, the literature has recognized the importance of third-party ratings and other certification programs for environmental governance. See David E. Adelman & Graeme W. Austin, *Trademarks and Private Environmental Governance*, 93 NOTRE DAME L. REV. 709, 710–11 (2017) (explaining how private environmental governance through product certification “fills information gaps related to public goods and common pool resources”); see also Michael P. Vandenberg, *Disclosure of Private Environmental Governance Risks*, WM. & MARY L. REV. (forthcoming 2021) (making a strong case for more consistent financial reporting of risks posed by private environmental governance initiatives).

232. See Kolchin, *supra* note 168, at 6 (reporting \$6 trillion and \$8.8 trillion in assets for defined contribution plans and individual retirement accounts, respectively). These numbers are all but certain to rise as the participant-directed 401(k) plans continue to replace professionally managed pension plans. See Jill E. Fisch & Tess Wilkinson-Ryan, *Why Do Retail Investors Make Costly Mistakes? An Experiment on Mutual Fund Choice*, 162 U. PA. L. REV. 605, 606 (2014) (“Over the past thirty-five years, participant-directed 401(k) plans have largely replaced professionally managed pension plans.”).

233. See Bhutta et al., *supra* note 170, at 16.

saving for retirement not only control a sizeable portion of the U.S. equities market, but they also manage their assets in a way that readily allows for consideration of corporate climate ratings. In 401(k) plans and other defined contribution plans, the employers sponsoring the plan determine the menu of investment options in conjunction with the service provider they have selected to manage the plan.²³⁴ Managing these retirement plans is a highly lucrative business for Fidelity, Vanguard, and other service providers who not only earn management fees but also increase the likelihood that employees invest their savings in the service provider's own funds and other products.²³⁵ As gatekeepers to these lucrative appointments, employers command considerable clout with service providers eager to secure, and retain, a plan sponsor's business.²³⁶ It would be easy for a climate-conscious employer, therefore, to require its service provider to include corporate climate ratings among the performance metrics of investment options displayed to their employees.²³⁷ The relatively small number of investment options available under 401(k) plans, meanwhile, increases the likelihood that climate ratings will, in fact, be one of the criteria by which employees make their investment choices.²³⁸

Not long ago, retail investors were considered a dying breed, fringe players in the capital markets arena with little to no prospect of shaping the outcome.²³⁹ Fast forward just a few years and, suddenly, mom-and-pop investors are back in the game, accounting for up to one-quarter of stock market trading volume.²⁴⁰ This retail investment renaissance is fueled, in

234. See, e.g., Veronika K. Pool et al., *It Pays To Set the Menu: Mutual Fund Investment Options in 401(k) Plans*, 71 J. FIN. 1779, 1782 (2016) (“401(k) menus are jointly determined by the plan sponsor (i.e., employer) and the plan’s service providers.”).

235. *Id.* at 1780, 1785 (finding “significant favoritism” toward “funds affiliated with the service provider” in a data set comprising nearly 2,500 retirement plans with an average plan size of \$324 million, surveyed over a ten-year period).

236. *Id.* at 1779–80.

237. See *id.* If the growing commitment among companies to renewable energy and other strategies for reducing their carbon footprint is any indication, this option should prove attractive to a wide range of retirement plan sponsors. See, e.g., Uma Outka, *100 Percent Renewable: Company Pledges and State Energy Law*, 2019 UTAH L. REV. 661, 671 (2019) (discussing commitments to become 100% renewably powered by 2020 from Apple, Bank of America, Coca-Cola, Nike, Walmart, and other icons of corporate America).

238. See Thomas W. Doellman et al., *Alphabeticity Bias in 401(k) Investing*, 54 FIN. REV. 643, 645 (2019) (“401(k) investors typically choose from a relatively small number of funds making it more manageable for investors to consider every option.”).

239. See, e.g., Alicia J. Davis, *A Requiem for the Retail Investor?*, 95 VA. L. REV. 1105, 1105 (2009) (“The American retail investor is dying.”).

240. See Alexander Osipovich, *Individual-Investor Boom Reshapes U.S. Stock Market*, WALL ST. J. (Aug. 31, 2020), <https://www.wsj.com/articles/individual-investor-boom-reshapes->

large part, by a surge in account openings at online brokerages.²⁴¹ Charles Schwab, E-Trade, and others have all experienced a huge influx of new clients, with the trading app Robinhood leading the charge on the strength of an unprecedented three million new accounts opened “in the first four months of 2020” alone.²⁴² Gone are the days when individual investors were simply chasing the market. Today, retail investors demonstrate their strength in numbers, ready to take on hedge funds and other institutional investors. In January 2021, Robinhood traders rallied to drive up the stock price of GameStop by 700%,²⁴³ inflicting billions of dollars in losses upon hedge funds that had shorted the stock.²⁴⁴ A recent study confirms the ability of online retail investors to have a significant impact on stock prices, finding

u-s-stock-market-11598866200 [https://perma.cc/UC9R-N9ZN] (reporting a near doubling of stock market trades by retail investors from 2010 to 2020); Telis Demos, *Online Brokers Go from Zero to Hero*, WALL ST. J. (Jan. 24, 2020), <https://www.wsj.com/articles/online-brokers-go-from-zero-to-hero-11579867200> [https://perma.cc/C46S-N5NU] (describing double-digit growth in trades executed via online trading platforms from 2019 to 2020).

241. Already, the boom in online retail investing has garnered the attention of Wall Street. See Michael J. de la Merced et al., *Morgan Stanley To Buy E-Trade, Linking Wall Street and Main Street*, N.Y. TIMES (Feb. 20, 2020), <https://www.nytimes.com/2020/02/20/business/morgan-stanley-etrade.html> [https://perma.cc/DPW3-JX72].

242. Weizhen Tan, *Retail Investing Boom May Spark Concerns, but Strategist Says Markets Have Lived Through It Before*, CNBC (Sept. 9, 2020), <https://www.cnbc.com/2020/09/10/markets-have-lived-through-retail-investing-booms-before-strategist-says.html> [https://perma.cc/2ZHP-TTQS] (“millennial-favored Robinhood”).

243. Maggie Fitzgerald, *Robinhood CEO Says Most Customers Are ‘Buy and Hold’ Amid GameStop Trading Frenzy*, CNBC (Jan. 27, 2021), <https://www.cnbc.com/2021/01/27/robinhood-ceo-says-most-customers-are-buy-and-hold-amid-gamestop-trading-frenzy.html> [https://perma.cc/PMB5-EJCH]; see also Nathaniel Popper et al., *Robinhood, Under the Gun, Raises \$2.4 Billion*, N.Y. TIMES (Feb. 1, 2021), <https://www.nytimes.com/2021/02/01/business/robinhood-gamestop-trading.html> [https://perma.cc/SWQ2-T25A] (describing the Robinhood saga as it unfolded); David Canellis, *At Least 7,500 Robinhood Traders Bought Hertz Stock After Its Latest 100% Pump*, THE NEXT WEB (June 25, 2020), <https://thenextweb.com/hardfork/2020/06/25/at-least-7500-robinhood-traders-bought-hertz-stock-after-its-latest-100-pump/> [https://perma.cc/MBQ6-VDNP] (detailing an earlier example of Robinhood traders coalescing around a failing stock in order to increase its value).

244. See Juliet Chung, *Citadel, Point72 To Invest \$2.75 Billion into Melvin Capital Management*, WALL ST. J. (Jan. 25, 2021), <https://www.wsj.com/articles/citadel-point72-to-invest-2-75-billion-into-melvin-capital-management-11611604340> [https://perma.cc/5AAC-XE9M] (pegging the GameStop-related losses of one hedge fund at \$3 billion); see also Popper et al., *supra* note 243 (reporting a 135% increase in the stock price of GameStop in a matter of hours that created losses for those shorting the stock); Canellis, *supra* note 243 (noting a similar 114% surge in Hertz’s stock price in just a few hours).

that Robinhood traders were responsible for over 7% of the cross-sectional variation in stock returns during the first half of 2020.²⁴⁵

Robinhood and other online brokerages are especially popular among millennials,²⁴⁶ the demographic that most fervently advocates for greater climate action.²⁴⁷ It stands to reason, therefore, that inclusion of corporate climate ratings among the performance metrics displayed by E-Trade, Charles Schwab, and Robinhood would help millennial retail investors put their money where their mouth is. If the recent GameStop rally is any indication, ratings that facilitate more climate-conscious investment by millennials are all but certain to help move the needle on low-carbon investment.

D. A Complement to Carbon Pricing

Corporate climate ratings complement carbon pricing policies by amplifying their incentives for abatement as well as mitigating some of the most pervasive pathologies resulting from today's patchwork of climate policies. Analysts consider carbon pricing and other policy responses to the climate crisis as part of the transitional climate risk faced by companies.²⁴⁸ With their incorporation of both physical and transitional climate risks,²⁴⁹ corporate climate ratings enable financial markets to better assess—and price—what burden, if any, a carbon tax, cap-and-trade regime, or any other form of carbon pricing would impose on companies. The resulting market pressure on companies with a high and, hence, costly carbon footprint would

245. See PHILIPPE VAN DER BECK & CORALIE JAUNIN, SWISS FIN. INST., RESEARCH PAPER SER. NO. 21-12, THE EQUITY MARKET IMPLICATIONS OF THE RETAIL INVESTMENT BOOM 4 (2021). This impact is all the more impressive considering that Robinhood traders control less than 0.1% of U.S. equities. *Id.* at 3. See also JEREMY MICHELS, RETAIL INVESTOR TRADE AND THE PRICING OF EARNINGS 23 (2021) (examining trading behavior by Robinhood users to conclude that retail trade “is . . . associated with significant changes in the price-earnings relation due to how these investors respond to earnings-related price movements”).

246. See Tan, *supra* note 242.

247. See, e.g., ALEC TYSON & BRIAN KENNEDY, PEW RSCH. CTR., TWO-THIRDS OF AMERICANS THINK GOVERNMENT SHOULD DO MORE ON CLIMATE 16 (2020) (reporting that, even among Republicans who are generally more skeptical of climate action, 88% of millennials support expanding development of solar farms, with similarly strong numbers for other types of low-carbon energy options); see also William F. Meehan III, *From Gore to Greta: Millennials Seize the Climate Change Torch from Baby Boomers*, FORBES (Sept. 26, 2019), <https://www.forbes.com/sites/williammeehan/2019/09/26/from-gore-to-greta-millennials-seize-the-climate-change-torch-from-babyboomers/?sh=3943f3032e25> [https://perma.cc/6UWZ-WGW3] (arguing that millennials are considerably more focused than earlier generations on “the greatest existential crisis in human history”).

248. See Light, *supra* note 3, at 166.

249. For a primer on both types of risk, see *supra* notes 2–3 and accompanying text.

amplify the abatement incentive of a price on carbon. But ratings of corporate climate risk and governance can do even more. By simultaneously capturing a company's vulnerability (risk) and contribution (governance) to climate change, these ratings help penalize corporate attempts to circumvent carbon pricing, such as through relocation of carbon-intensive activities and other evasive strategies.²⁵⁰

Economists have long argued for carbon pricing, by means of a tax on greenhouse gas emissions or a cap-and-trade regime with tradable emission allowances, as the first-best policy approach to mitigating climate change.²⁵¹ From an efficiency perspective, a carbon tax or cap-and-trade program would incur far lower opportunity costs than the current potpourri of policies seeking to combat climate change through financial and regulatory incentives for solar, wind, and other low-carbon technologies.²⁵² Both public funding for innovative efforts and the number of available experts are limited. Resources committed to the promotion of specific low-carbon energy technologies are, therefore, unavailable to foster technological advances in other fields.²⁵³ Whereas carbon pricing policies force emitters to internalize the social cost of their emissions and thereby correct a market failure—in other words, an existing distortion in the economy—policies promoting low-carbon technologies add a new distortion to the market.²⁵⁴ Moreover, the transaction costs associated with a carbon tax are likely to be lower than those generated by the administration of technology policies that actively support low-carbon technologies.²⁵⁵

Despite the many arguments that weigh heavily in favor of a carbon tax or cap-and-trade regime, empirical evidence from around the world suggests that a meaningful price on greenhouse gas emissions remains elusive in many

250. For an introduction to resource shuffling, emissions leakage, and other challenges presented by the existing patchwork of carbon pricing policies, see Jim Rossi & Andrew James Dearing Smith, *Electric Power Resource "Shuffling" and Subnational Carbon Regulation: Looking Upstream for a Solution*, 5 SAN DIEGO J. CLIMATE & ENERGY L. 43 (2014) (discussing the example of California's cap-and-trade regime pursuant to Assembly Bill 32).

251. See, e.g., Adam B. Jaffe et al., *A Tale of Two Market Failures: Technology and Environmental Policy*, 54 ECOLOGICAL ECON. 164, 165, 169 (2005); Dominique Finon, *Pros and Cons of Alternative Policies Aimed at Promoting Renewables*, 12 EIB PAPERS, no. 2, 2007, at 110, 112; Kolev & Riess, *supra* note 44, at 140; STERN, *supra* note 12, at 35, 348.

252. See Kolev & Riess, *supra* note 44, at 140. For a representative survey of the primary policies to promote low-carbon renewable energy technologies, see Felix Mormann, *Enhancing the Investor Appeal of Renewable Energy*, 42 ENV'T L. 681, 690–95 (2012).

253. See Mormann, *supra* note 252.

254. See *id.* Like carbon pricing policies, corporate climate ratings seek to correct the market failure of emission externalities by enabling capital markets to incorporate companies' carbon emissions and other climate risk factors into their valuation of a company and its assets. See *infra* Part III.D.

255. See Kolev & Riess, *supra* note 44, at 140.

jurisdictions, at least for the foreseeable future. In 2010, expert commentators called the assumption “naïve” that carbon pricing was “politically achievable” in the United States.²⁵⁶ More than a decade later, this assessment has proven sadly prophetic, at least at the national level.²⁵⁷ Even President Biden’s ambitious climate plan makes no express reference to a carbon tax or nationwide cap-and-trade program.²⁵⁸ Carbon pricing initiatives have fared better at the global level, with a total of 61 policies implemented or scheduled, slated to cover 22% of global greenhouse gas emissions.²⁵⁹ A closer look, however, reveals that many of these policies woefully underprice carbon. According to the International Monetary Fund, the average price imposed on carbon emissions worldwide is only 2 dollars per ton²⁶⁰—a tiny fraction of the price that experts consider necessary to keep global warming below 2 degrees Celsius.²⁶¹ Only 5% of emissions subject to carbon pricing, a meager 1% of all global greenhouse gas emissions, are priced high enough to meet the climate targets of the Paris Agreement.²⁶²

The current patchwork of carbon pricing policies at regional, national, and sub-national levels of governance is prone to resource shuffling and emissions leakage, resulting in partial relocation, instead of overall reduction,

256. John A. Alic et al., *A New Strategy for Energy Innovation*, 466 NATURE 317 (2010).

257. See, e.g., *The Biden Plan for a Clean Energy Revolution and Environmental Justice*, BIDEN HARRIS, <https://joebiden.com/climate-plan/> [<https://perma.cc/EJN6-QXV4>] [hereinafter *The Biden Plan*] (making no reference to a carbon tax or national cap-and-trade program). Subnational carbon pricing initiatives, such as the Regional Greenhouse Gas Initiative in the Northeast and California’s cap-and-trade regime, have made valiant efforts to fill the federal policy void, albeit with limited coverage. See *Welcome, THE REG’L GREENHOUSE GAS INITIATIVE*, <https://www.rggi.org/> [<https://perma.cc/YQJ9-VAGY>]; *Cap-and-Trade Program*, CAL. AIR RES. BD., <https://ww2.arb.ca.gov/our-work/programs/cap-and-trade-program> [<https://perma.cc/NS69-XQBB>].

258. See *The Biden Plan*, *supra* note 257. But see Ottmar Edenhofer, *Carbon Pricing Could Be the Biden Administration’s Climate Tool*, HILL (Jan. 20, 2021), <https://thehill.com/opinion/energy-environment/534985-carbon-pricing-could-be-the-biden-administrations-climate-tool> [<https://perma.cc/4NX5-4GAX>].

259. MARISSA SANTIKARN ET AL., WORLD BANK GRP., STATE AND TRENDS OF CARBON PRICING 2020, at 18 (2020) (reporting a near even split into 31 cap-and-trade and 30 carbon tax policies).

260. See Ian Parry, *Putting a Price on Pollution*, FIN. & DEV., Dec. 2019, at 16, 18.

261. See, e.g., CARBON PRICING LEADERSHIP COAL., REPORT OF THE HIGH-LEVEL COMMISSION ON CARBON PRICES 3, 50 (2017) (pegging the required carbon price at \$40–\$80 per ton for 2020 and \$50–\$100 per ton for 2030).

262. See SANTIKARN ET AL., *supra* note 259, at 20. But see Patrick Bayer & Michael Aklin, *The European Union Emissions Trading System Reduced CO₂ Emissions Despite Low Prices*, 117 PROC. NAT’L ACAD. SCIS. 8804 (2020) (arguing that a stable carbon pricing program with long-term credibility can achieve significant emissions reductions without high prices).

of greenhouse gas emissions.²⁶³ Some models suggest that nearly half of the emissions reductions achieved by carbon pricing in one jurisdiction may simply shift to neighboring jurisdictions without a price on carbon.²⁶⁴ Instead of actual abatement, large multinationals can just relocate their carbon-intensive operations to more emissions-friendly jurisdictions.²⁶⁵ An oil-and-gas major headquartered in the United States and listed on the New York Stock Exchange, for example, may focus its extractive efforts on offshore fields developed through subsidiaries in order to escape notoriety and carbon pricing in its home jurisdiction. The resulting reductions in the company's domestic carbon footprint might unduly endear its stock to investors who lack the time and resources to study the corporate activities in sufficient detail to uncover its carbon shuffling. Comprehensive ratings of corporate climate risk and governance enable investors to see through these and other circumvention strategies, thereby enhancing the real-world reach and impact of carbon pricing policies.

E. Common Ground Amidst Partisan Climate Politics

Corporate climate ratings have the potential to improve the political economy of climate policy and create much-needed common ground amidst increasingly polarized partisan politics. Climate change has long graduated from a niche topic that fills the news lull during quiet (and hot) summer months and entered the political mainstream. Today, 3 in 5 Americans recognize global warming as a political issue.²⁶⁶ In early 2020, a nationally representative survey among U.S. adults found that, for the first time ever, nearly as many Americans considered “protecting the environment . . . a top policy priority (64%)” as they did “strengthening the economy (67%).”²⁶⁷ A majority of Americans specifically named climate change as a top policy priority (52%), an increase of more than one-third compared to 3 years

263. For a snapshot of the rich literature on emissions leakage under carbon pricing policies, see James Bushnell & Yihsu Chen, *Allocation and Leakage in Regional Cap-and-Trade Markets for CO₂*, 34 RES. & ENERGY ECON. 647 (2012); Harro van Asselt & Thomas Brewer, *Addressing Competitiveness and Leakage Concerns in Climate Policy: An Analysis of Border Adjustment Measures in the US and the EU*, 38 ENERGY POL'Y 42 (2010).

264. See Justin Caron et al., *Leakage from Sub-National Climate Policy: The Case of California's Cap-and-Trade Program*, 36 ENERGY J. 167, 188 (2015) (modeling that 45% of emissions reductions observed in California register as emissions increases in neighboring states).

265. See *id.*

266. See ANTHONY LEISEROWITZ ET AL., YALE PROGRAM ON CLIMATE CHANGE COMM'N & GEORGE MASON UNIV. CTR. FOR CLIMATE CHANGE COMM'N, CLIMATE CHANGE IN THE AMERICAN MIND 26, 96 (2020).

267. PEW RSCH. CTR., AS ECONOMIC CONCERNS RECEDE, ENVIRONMENTAL PROTECTION RISES ON THE PUBLIC'S POLICY AGENDA 4, 6 (2020).

earlier.²⁶⁸ But the nation is deeply conflicted over whether and how politics should contribute to a solution.²⁶⁹

As scientific consensus around the causes and effects of climate change continues to solidify, the American public is growing ever more divided.²⁷⁰ In the words of one commentator, “climate change is currently at its most politicized.”²⁷¹ The wide gap in how Democrats and Republicans assess the reality and importance of climate change has persisted for more than 2 decades.²⁷² But both camps are now further apart than ever before. 78% of Democrats view climate change as a top policy priority, compared to only 21% of Republicans.²⁷³ Another survey, administered in the summer of 2019 while record heat waves were sweeping through Europe and the United States, confirms the American public’s deep, and wide, partisan divide over climate issues.²⁷⁴ While 68% of Democrats indicated they were “very concerned” about climate change, a mere 22% of Republicans showed the same level of concern.²⁷⁵ On the other hand, 59% of Republicans thought that the threat of climate change was exaggerated, compared to just 11% of Democrats.²⁷⁶ Similarly, 72% of Democrats, but only 32% of Republicans, claimed to have personally felt the effects of climate change.²⁷⁷ Perhaps most telling, however, is the fact that a strong majority of Republicans (57%) denies that climate change is happening as the result of human activity, compared to a small fraction of Democrats (15%).²⁷⁸ Even the occurrence of

268. *Id.* The COVID-19 crisis, breaking shortly after the survey was conducted, is likely to have refocused American priorities on economic, rather than environmental issues.

269. See, e.g., Nadja Popovich, *Climate Change Rises as a Public Priority. But It’s More Partisan Than Ever*, N.Y. TIMES (Feb. 20, 2020), <https://nyti.ms/37JoN2e> [<https://perma.cc/2XSG-PWF5>]; Oliver Milman, *Political Polarisation over Climate Crisis Has Surged Under Trump*, GUARDIAN (Oct. 11, 2019), <https://www.theguardian.com/environment/2019/oct/11/political-polarisation-climate-crisis-trump> [<https://perma.cc/Z8MG-D6FT>].

270. See Dunlap et al., *supra* note 36, at 10; Kamarck, *supra* note 36.

271. Jacqueline Toth, *As Wildfires Rage, Divide Widens Between Democratic, GOP Voters on Climate Change*, MORNING CONSULT (Aug. 22, 2018), <https://morningconsult.com/2018/08/22/as-wildfires-rage-divide-widens-between-democratic-gop-voters-climate-change/> [<https://perma.cc/MV6Y-CNWS>].

272. See *id.*

273. See PEW RSCH. CTR., *supra* note 267, at 6, 8.

274. See THE ECONOMIST/YOUGOV POLL: JULY 27 – 30, 2019 – 1500 US ADULT CITIZENS 77–83 (July 2019), https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/hash0nbry8/econTabReport.pdf [<https://perma.cc/UXY4-3H76>].

275. *Id.* at 77.

276. *Id.* at 79.

277. *Id.* at 81.

278. See *id.* at 82.

hurricanes, wildfires, and other natural disasters in unprecedented frequency and severity has had little, if any, effect on the partisan gulf on climate.²⁷⁹

Corporate climate ratings have the potential to bring both parties closer together on this critical issue. After all, political scientists attribute the American public's growing partisan polarization over climate change to both parties' divergent positions on the appropriate role, and size, of government.²⁸⁰ The prevailing anti-regulatory view of government among Republicans is thought to be the driving force behind their refusal to recognize the reality and importance of climate change.²⁸¹ Deeply rooted fear of the climate crisis' regulatory implications, including carbon pricing, some argue, is a key motivator behind organized climate change denial.²⁸²

If the divide over climate change, indeed, follows the same fault lines as the age-old conflict over big government versus market fundamentalism, then an informational nudge like corporate climate ratings could help create much-needed common ground. Studies have shown that, as a general matter, "Republicans do not like nudges more or less than Democrats do."²⁸³ Researchers find no evidence of partisan differences in the American public's response to nudges when described without mention of specific policy objectives.²⁸⁴ Even when connected to specific policy goals and policymakers, Democrats and Republicans overwhelmingly concurred in their approval of recent informational nudges, such as calorie labels or graphic warnings on cigarette packages.²⁸⁵ Ratings of corporate climate risk and governance should be even more appealing to Republicans than the above labels and warnings given the ratings' reliance on the market's invisible hand to determine whether and how climate change should factor into investor choices.²⁸⁶

279. See Kamarck, *supra* note 36.

280. See, e.g., Dunlap et al., *supra* note 36, at 15. See generally ORESKES & CONWAY, *supra* note 37.

281. See Dunlap et al., *supra* note 36, at 15; see also Riley E. Dunlap & Aaron M. McCright, *The Politicization of Climate Change: Political Polarization in the American Public's Views of Global Warming*, 52 SOCIO. Q. 155, 160 (2011).

282. See Dunlap et al., *supra* note 36, at 15; Dunlap & McCright, *supra* note 281, at 160.

283. Cass R. Sunstein, *People Prefer System 2 Nudges (Kind of)*, 66 DUKE L.J. 121, 142 (2016).

284. See Janice Y. Jung & Barbara A. Mellers, *American Attitudes Toward Nudges*, 11 JUDGMENT & DECISION MAKING 62, 63 (2016).

285. See Sunstein, *supra* note 39, at 187 (reporting, for example, approval ratings of 92% vs. 77% on calorie labels and 77% vs. 68% on cigarette warnings for Democrats and Republicans, respectively).

286. See Ash Gillis et al., *Convincing Conservatives: Private Sector Action Can Bolster Support for Climate Change Mitigation in the United States*, 73 ENERGY RES. & SOC. SCI. 101947, 101947 (2021) (identifying an "indirect positive spillover effect" when moderates and

III. EMPIRICAL EVIDENCE: NUDGING FINANCIAL MARKETS

Legal scholars are quick to offer policy recommendations and prescriptions informed by our understanding of the pertinent literature, welfare economics, political intuition, and other sources of inspiration. But we rarely bother to test, let alone validate, the real-world applicability of our wisdom, leaving the implementation of our oh-so-brilliant ideas to the policymakers whose attention our writing hopes to attract. The law professor among us has also been guilty of this lofty approach.²⁸⁷ This section reports the attempt to put our money—or, to be exact, that of retail investors—where our mouth is. We collected and analyzed experimental data from over fifteen hundred participants to test whether corporate climate ratings can, in fact, nudge investors toward more climate-friendly investment decisions.

Calls for more and better disclosure of climate-related financial information by publicly listed companies implicitly assume that such disclosures will affect investor behavior.²⁸⁸ Presumably, understanding the threats and opportunities that climate change presents for a given company enables rational investors to reconsider the profitability of buying stocks, bonds, or other securities issued by that company.²⁸⁹ Other, less profit-oriented investors may want to base their choice of stocks on the issuing corporation's position on climate change, scolding bad actors while rewarding leaders in mitigation and adaptation with their capital investment.²⁹⁰ The following survey experiments test whether the inclusion of a climate rating among stock performance metrics can nudge investors toward more climate-friendly choices.

conservatives “perceive[] private approaches to be feasible and effective,” fostering greater support for climate change mitigation).

287. See, e.g., Gary Lucas, Jr. & Felix Mormann, *Betting on Climate Policy: Using Prediction Markets To Address Global Warming*, 52 U.C. DAVIS L. REV. 1429 (2019) (calling for use of prediction markets to inform the design and implementation of carbon pricing and other climate policies); Felix Mormann, *Clean Energy Equity*, 2019 UTAH L. REV. 335 (2019) (recommending greater application of Elinor Ostrom's polycentric approach to government to address the distributional inequities caused by the transition to a low-carbon economy); Felix Mormann, *Clean Energy Federalism*, 67 FLA. L. REV. 1621 (2015) (advocating for closer integration of quantity- and price-based clean energy policies).

288. See *supra* notes 226–245 and accompanying text.

289. See *id.*

290. See Herwig Pilaj, *The Choice Architecture of Sustainable and Responsible Investment: Nudging Investors Toward Ethical Decision-Making*, 140 J. BUS. ETHICS 743, 745 (2017) (“Investors want more than just to maximize their expected payoff. . . . Money is not everything. While we want to make money, we simultaneously want to express personal values and seek peer approval.”); Ryan W. Buell & Basak Kalkanci, *How Transparency into Internal and External Responsibility Initiatives Influences Consumer Choice*, 67 MGMT. SCI. 932 (2021) (presenting evidence that consumers take corporate responsibility efforts, including sustainability initiatives, into account in their decision making).

A. Methods and Data

Data was collected in three batches through two digitally administered survey experiments designed for the stated purpose of better understanding financial decision-making—a study title sufficiently general to avoid unduly biasing participants.²⁹¹ Experimental methods are widely used for research in economics²⁹² and have steadily gained importance in investment and other financial contexts.²⁹³ At the same time, online experiments have emerged as a generally accepted alternative to lab experiments.²⁹⁴

For the first batch, 590 participants were recruited through Texas A&M University's (TAMU) Bulkmail service, a listserv that reaches university students, staff, and faculty who have opted into receiving research emails.²⁹⁵ University affiliates participated voluntarily and without compensation, motivated by a shared sense of identity and the common goal of advancing knowledge.

Mindful of the lack of representativeness and other well-documented limitations of university-recruited participant pools,²⁹⁶ two more batches of 500 participants each were recruited using Amazon's Mechanical Turk (MTurk) platform that provides researchers with relatively low-cost access to online experiment participants. Participants recruited through MTurk completed online experiments in exchange for compensation. The relatively modest amounts of compensation offered notwithstanding, experimental data collected on MTurk have been found valid across a wide range of contexts.²⁹⁷

291. All experiments were approved by Texas A&M University's Institutional Review Board under IRB 2020-0723.

292. See, e.g., John A. List, *Why Economists Should Conduct Field Experiments and 14 Tips for Pulling One Off*, 25 J. ECON. PERSPS. 3 (2011); Vernon L. Smith, *Economics in the Laboratory*, 8 J. ECON. PERSPS. 113 (1994).

293. See, e.g., Brian Knutson & Peter Bossaerts, *Neural Antecedents of Financial Decisions*, 27 J. NEUROSCIENCE 8174 (2007).

294. See, e.g., John J. Horton et al., *The Online Laboratory: Conducting Experiments in a Real Labor Market*, 14 EXPERIMENTAL ECON. 399 (2011).

295. Bulkmail, TEX. A&M UNIV., <https://it.tamu.edu/services/email-messaging-and-collaboration/email-tools/bulkmail/> [<https://perma.cc/RJL9-MUDG>].

296. See, e.g., Joseph Henrich et al., *The Weirdest People in the World?*, 33 BEHAV. & BRAIN SCIS. 61 (2010) (offering a powerful critique of the disproportionate representation of “Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies” in behavioral research recruiting from university subject pools); see also Gabriele Paolacci et al., *Running Experiments on Amazon Mechanical Turk*, 5 JUDGMENT & DECISION MAKING 411 (2010) (“Internet subject populations tend to be closer to the U.S. population as a whole than subjects recruited from traditional university subject pools.”).

297. See, e.g., Michael Buhrmester et al., *Amazon's Mechanical Turk: A New Source of Inexpensive Data?*, 6 PERSPS. ON PSYCH. SCI. 3 (2011); Leib Litman et al., *The Relationship Between Motivation, Monetary Compensation, and Data Quality Among US- and India-Based*

To ensure the highest-possible quality of data, the survey was run using Amazon's CloudResearch platform, formerly known as TurkPrime, that offers a variety of advanced filtering functions.²⁹⁸ The survey experiment was open only to participants who had successfully completed at least five hundred other MTurk tasks with an approval rate of 93% or better.

In addition, all three batches were subject to the following, widely used measures to ensure that only data from participants who made a *bona fide* effort would be analyzed. Data from participants who failed to answer all questions in the relatively short survey (median response time of five minutes) were excluded from analysis. Participants who failed to follow survey instructions, most notably to allocate the exact sum of \$5,000 or percentages totaling 100% among the three target stocks, were also excluded.²⁹⁹ Application of these control measures resulted in a final sample of 559 responses from the TAMU population as well as 496 and 478 responses, respectively, obtained via MTurk. TAMU respondents skewed 60% female and were between 18 and 81 years old (with a mean of 31 years). In the first MTurk batch, respondents skewed 56% male and were between 18 and 77 years of age (with a mean of 39 years). Respondents in the second MTurk batch also skewed 54% male with an age range from 20 to 79 years (with a mean of 40 years). Table 1 offers a summary of participant demographics.

Workers on Mechanical Turk, 47 BEHAV. RSCH. METHODS 519 (2015); for examples of data collection via MTurk for legal scholarship, see Christopher Buccafusco et al., *Experimental Tests of Intellectual Property Laws' Creativity Thresholds*, 93 TEX. L. REV. 1921 (2014); Simon Hedlin & Cass R. Sunstein, *Does Active Choosing Promote Green Energy Use? Experimental Evidence*, 43 ECOLOGY L.Q. 107 (2016).

298. For a primer on TurkPrime, see Leib Litman et al., *TurkPrime.com: A Versatile Crowdsourcing Data Collection Platform for the Behavioral Sciences*, 49 BEHAV. RSCH. METHODS 433 (2017).

299. For an introduction to the widespread use of these and other attention checks in survey experiments on MTurk and beyond, see David J. Hauser & Norbert Schwarz, *Attentive Turkers: MTurk Participants Perform Better on Online Attention Checks than do Subject Pool Participants*, 48 BEHAV. RSCH. METHODS 400 (2016).

	Experiment 1		Experiment 2
	TAMU	MTurk 1	MTurk 2
Participant Pool	TAMU	MTurk 1	MTurk 2
Number of Participants	559	496	478
Average Age	31 years	39 years	40 years
Gender	60% female	56% male	54% male

Table 1: Participant demographics by participant pool

B. Experiment 1: Climate Ratings Impact Investor Choices

To test whether corporate climate ratings have an effect on investor decision making, the following first experiment was devised to compare the investment behavior of participants across two conditions. The control condition presented participants with stock investment options accompanied by performance data representative of online trading platforms, while the treatment condition included climate ratings as an additional metric for each stock. Results provide strong evidence of a climate ratings effect on retail investor behavior.

1. Experimental Design

At the beginning of the survey, participants were randomly assigned to one of two groups. Both groups were presented with a hypothetical scenario in which participants had decided to invest a recent inheritance of \$5,000 in stocks. Having narrowed their investment options down to three options, they were presented with a table that listed the stocks of corporations “A,” “B,” and “C,” as well as the kind of data on historical performance typically displayed by online trading platforms. After looking over their respective stock table, each respondent was asked to allocate their \$5,000 across the three stocks on display. After participants completed the investment task, additional information was collected for control variables, such as financial literacy, investment experience, political beliefs, attitude towards the environment, and demographics.

Name	Asset Class	Listed	1-yr performance	3-yr performance
A Corp.	Stocks	NYSE	6.73%	13.48%
B Corp.	Stocks	NYSE	8.10%	15.18%
C Corp.	Stocks	NYSE	7.42%	14.71%

Figure 1: Stock table displayed in control condition

Figure 1 depicts a version of the stock table shown to participants assigned to the control condition. Within each condition, participants were randomly assigned to sub-conditions that varied the order in which stocks were listed in the table to ensure that results were not affected by the ordering or other visual representation of stocks.³⁰⁰ Based on past performance, a commonly used indicator of future performance,³⁰¹ the stocks of “B Corp.” would promise the highest returns and presumably attract greater investment than solid-performing “C Corp.” or worst-performing “A Corp.” Figure 2 depicts a version of the stock table displayed to participants assigned to the treatment condition. Here, the dummy variable of listed stock exchange has been replaced with a graphic illustration of the corporations’ climate rating. The previously dominant investment choice (“B Corp.”) features the worst climate rating of the three stocks, worst-performing “A Corp.” has a middling rating, and solid-performing “C Corp.” boasts the highest climate rating. As in the control condition, participants in the treatment condition were randomly assigned to sub-conditions that varied the order in which stocks were listed in the table to ensure that results were not affected by the ordering or other visual representation of stocks.³⁰²

300. See Doellman et al., *supra* note 238, at 643, 657 (demonstrating that the order in which investment options are displayed has a significant impact on fund allocation by investors).

301. See, e.g., Shlomo Bernartzi, *Excessive Extrapolation and the Allocation of 401(k) Accounts to Company Stock*, 56 J. FIN. 1747 (2001) (observing excessive extrapolation of past performance by investors attempting to predict a stock’s future performance); Beth A. Pontari et al., *Regulating Information Disclosure in Mutual Fund Advertising in the United States: Will Consumers Utilize Cost Information?*, 32 J. CONSUMER POL’Y 333, 333, 342 (2009) (finding that investors “overwhelmingly continue to use past performance” when choosing among investment options, even when confronted with highly salient advertisements of other relevant metrics); see also Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 SCIENCE 1124, 1126 (1974) (noting how a representativeness bias leads to predictions of future developments, in stock value and beyond, to be made based on past performance and events).

302. See Doellman et al., *supra* note 238, at 643, 657.

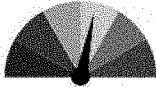


Name	Asset Class	Climate Rating	1-yr performance	3-yr performance
A Corp.	Stocks		6.73%	13.48%
B Corp.	Stocks		8.10%	15.18%
C Corp.	Stocks		7.42%	14.71%

Figure 2: Stock table displayed in treatment condition

2. Results

In both the TAMU and MTurk batches of Experiment 1, the inclusion of a climate rating among the stock performance data presented to participants significantly increased the amount of money they invested in “C Corp.,” the company whose stock offered a solid, albeit not the best, performance track record but featured the highest climate rating.

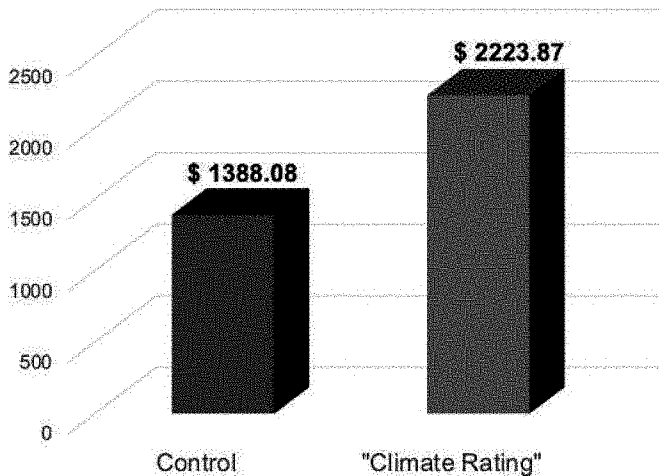


Figure 3: Mean investment in most climate-friendly stock by MTurk participants

MTurk participants in the treatment condition invested, on average, \$2,223.87 (SD=1,280.16) in the solid-performing but highest climate-rated stock of “C Corp.” compared to the mean investment of \$1,338.08 (SD=638.76) by participants in the control condition who were not provided with climate ratings. Put differently, inclusion of a climate rating in the stock performance data presented to participants increased investment in the company with the highest climate rating but middling stock performance by, on average, \$835.79 or 60% compared to the control condition. These results, depicted in Figure 3 above, are highly statistically significant ($p < .001$)³⁰³ and hold when controlling for age, gender, political beliefs, investment experience, household income, and other demographic factors.

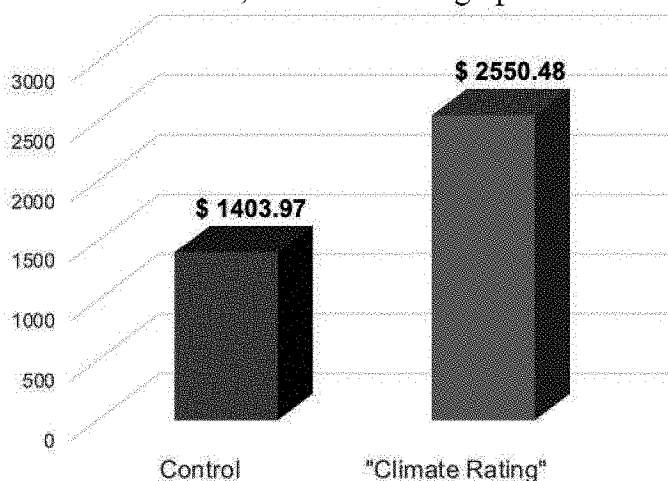


Figure 4: Mean investment in most climate-friendly stock by TAMU participants

The observed effect was even larger for responses collected from members of the TAMU community. Here, participants in the treatment condition invested, on average, \$2,550.48 (SD=1,223.91) in the solid-performing stock of the highest climate-rated company compared to the mean investment of \$1,403.97 (SD=823.89) by participants in the control condition who were not exposed to the climate rating. In other words, the climate rating increased investment in the highest-rated company by, on average, \$1,146.51 or 82% compared to the control condition. These results, depicted in Figure 4 above, are highly statistically significant ($p < .001$).

303. With the exception of our regression analysis below, statistical significance throughout this Article is determined via paired t-tests. For a discussion of the use of t-tests in statistical analysis, see Michael P. Fay & Michael A. Proschan, *Wilcoxon-Mann-Whitney or T-Test? On Assumptions for Hypothesis Tests and Multiple Interpretations of Decision Rules*, 4 STAT. SURVS. 1 (2010).

C. Experiment 2: The Impact of Framing and Format

Experiment 2, described in greater detail below, was inspired by the desire to better understand the climate ratings effect on investor behavior. Drawing from the literature on behavioral economics and choice architecture, manipulations to framing and display format tested the efficacy of various potential representations of corporate climate ratings. Subtle changes to the experimental design further increased overall ecological validity³⁰⁴ while ruling out competing explanations for the observed effect of climate ratings on investment choices. The results of Experiment 2 confirm the capacity of corporate climate ratings to nudge investors toward more climate-friendly investment choices, while adding valuable nuance to better understand how differences in framing and display format impact overall effect magnitude.

1. Experimental Design

The large effects observed in Experiment 1 raise the question whether participants' responses might have been driven, at least in part, by considerations beyond the information embedded in the rating of the three companies' climate risk and governance. Specifically, responses could have been affected by the saliency of the climate ratings' colorful graphical representation.³⁰⁵ Accordingly, color graphics were replaced with grayscale versions for the second experiment, as illustrated in Figure 5. To illustrate the randomization of stock presentation and sequencing within conditions, this figure depicts "A Corp." as the most climate-friendly company.

304. The term "ecological validity" is used to connote the extent to which it is possible to generalize from observed behavior in a laboratory or other controlled experimental settings to natural behavior in the real world. See, e.g., Mark A. Schmuckler, *What Is Ecological Validity? A Dimensional Analysis*, 2 *INFANCY* 419, 420 (2010) ("[E]cological validity often refers to the relation between real-world phenomena and the investigation of these phenomena in experimental contexts").

305. A growing body of literature has documented the pervasive effects of saliency on perception and choice. See, e.g., Blythe R. Towal et al., *Simultaneous Modeling of Visual Saliency and Value Computation Improves Predictions of Economic Choice*, 110 *PROC. NAT'L. ACAD. SCI. U.S.* 3858 (2013) (explaining how more salient items in a display attract more attention and, presumably, greater consideration from consumers); William J. Bazley et al., *Visual Finance: The Pervasive Effects of Red on Investor Behavior*, 67 *MGMT. SCI.* 5301 (2021) (offering empirical evidence of the way that the use of certain colors in the display of financial information affects investor behavior).

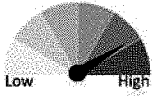
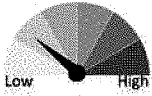
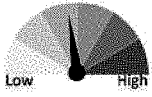
Name	Asset Class	Contribution to Climate Change	1-yr performance	3-yr performance
A Corp.	Stocks		8.10%	15.18%
B Corp.	Stocks		\$7.42%	14.71%
C Corp.	Stocks		6.73%	13.48%

Figure 5: Grayscale graphics in treatment condition “Contribution to Climate Change”

A second potential problem with the original experimental design relates to the fact that participants’ remuneration was originally set without consideration of their investment choices. This disconnect between task compensation and stock performance calls into question whether respondents would have made the same investment decisions if returns from the chosen investment portfolio had the potential to affect their personal bottom line. Empirical evidence suggests that, on socially sensitive topics such as climate change or clean energy, survey respondents often opt for what they consider the socially appropriate answer.³⁰⁶ But when it comes time to put their money where their mouth is, few follow through.³⁰⁷ To preempt this “lip service” or “bank money” effect, Experiment 2 includes a performance incentive, allowing participants to earn a bonus of up to 50% on top of their guaranteed task compensation, based on the simulated performance of their chosen stock portfolio.³⁰⁸

Behavioral research has long recognized the fundamental importance of available information and its processing for decision outcomes.³⁰⁹ Well-established limits in the human capacity for processing information call for presenting decision-relevant information in a format that is easy to digest and

306. See Pilaj, *supra* note 290, at 745 (noting investors’ desire for peer approval of their asset allocation choices).

307. See, e.g., Kolev & Riess, *supra* note 44, at 144 (reporting that one in three electricity customers expressed their willingness to opt into higher-priced, clean power plans, but only a fraction actually subscribed to the green plan their utility offered).

308. For examples of experimental asset markets with similar performance incentives, see Martin Weber & Colin F. Camerer, *The Disposition Effect in Securities Trading: An Experimental Analysis*, 33 J. ECON. BEHAV. & ORG. 167 (1998); Bazley et al., *supra* note 305, at 5621.

309. See generally Herbert A. Simon, *A Behavioral Model of Rational Choice*, 69 Q.J. ECON. 99 (1955) (introducing the concept of bounded rationality for decision-making that deviates from perfectly rational choices due to cognitive limitations and cues in the choice environment).

understand.³¹⁰ Successful framing and formatting strategies include translating available information into more meaningful formats, rendering relevant but not necessarily available information more visible, and the provision of social reference points.³¹¹ To better understand the impact of framing and presentation on the efficacy of corporate climate ratings, Experiment 2 complemented the treatment condition of a generic “Climate Rating” from Experiment 1 with three novel treatment conditions. While three of the four treatment conditions featured the same type of grayscale graphics, their labeling varied. Two of the new treatment conditions were labeled “Contribution to Climate Change” and “Vulnerability to Climate Change.” Notwithstanding variations in labeling, graphics were identical across all three graphically represented treatment conditions to ensure consistency and comparability. The third new treatment condition, labeled “Global Warming Pathway,” is based on CDP’s latest initiative to translate corporate climate risk and governance into a global warming trajectory. This translational assessment considers a company’s current carbon footprint as well as stated targets for future emission reductions, then determines the long-term global warming potential if worldwide greenhouse gas emissions were reduced at the same pace as the company’s.³¹² This treatment condition is the only one using numbers instead of graphics, adopting CDP’s representation of the resulting pathway for global warming in degrees Celsius, as illustrated in Figure 6. To illustrate the randomization of stock presentation and sequencing within conditions, Figure 6 depicts “A Corp.” as the most climate-friendly company.

310. See George A. Miller, *The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information*, 63 PSYCH. REV. 81 (1956).

311. See, e.g., Richard P. Larrick & Jack B. Soll, *The MPG Illusion*, 320 SCIENCE 1593 (2008) (revealing cognitive limitations that lead consumers to misinterpret gas-mileage information depicted in the miles-per-gallon format—findings that led to revision of the so-called Monrooney label for new vehicles); Simon et al., *supra* note 194 (reporting a 13% decrease in hospitalizations for foodborne illness following the requirement for restaurants to display their hygiene ratings). A comprehensive discussion of the multitude of potential interventions related to decision information is beyond the scope of this work. Readers interested in exploring more than the illustrative examples provided above are encouraged to consult Robert Münscher et al., *A Review and Taxonomy of Choice Architecture Techniques*, 29 J. BEHAV. DECISION MAKING 511, 514–16 (2016).

312. CDP *Temperature Ratings*, CLIMATE DISCLOSURE PROJECT, <https://www.cdp.net/en/investor/temperature-ratings> [<https://perma.cc/F9QM-STY9>].

Name	Asset Class	Global Warming Pathway	1-yr performance	3-yr performance
A Corp.	Stocks	1.8 degrees	7.42%	14.71%
B Corp.	Stocks	2.4 degrees	6.73%	13.48%
C Corp.	Stocks	3.1 degrees	8.10%	15.18%

Figure 6: Numerical information in treatment condition “Global Warming Pathway”

2. Results

Experiment 2 provides further evidence of the climate ratings effect on retail investor behavior. Compared to the control condition, participants across all treatment conditions invested more of their money in “C Corp.,” the company featuring the best climate rating and a solid, but not the strongest stock performance track record among the three stocks. Variations in the observed effect size provide important insights into which framing and formatting approaches have the greatest appeal to investors, including some counter-intuitive findings.

In the “Climate Rating” treatment condition carried over from Experiment 1, the observed effect was reduced, confirming our intuition that initial results may have been driven, in part, by the visual saliency of ratings and the “bank money” effect. Even after mitigating these distractors with the use of grayscale graphics and by offering a strong performance incentive, however, the overall effect remained statistically significant ($p=.03$): participants in the “Climate Rating” condition invested, on average, \$1,735.88 ($SD=1,157.61$) in climate-friendly “C Corp.” compared to only \$1,444.07 ($SD=629.92$) in the control condition. The observed climate ratings effect in this condition, thus, produced an increase of \$291.81 or 20% in climate-friendly investment.

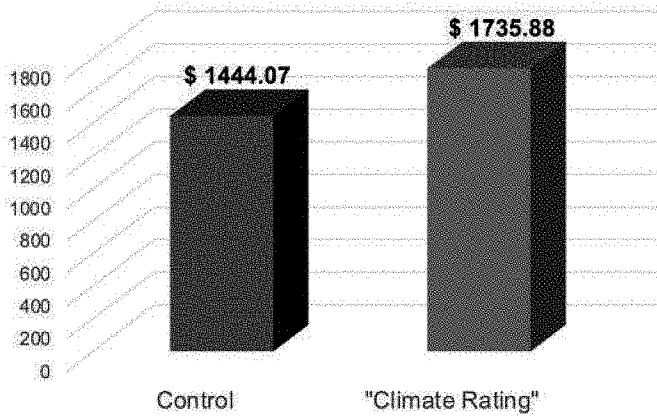


Figure 7: Mean investment in “Climate Rating” condition

The role of past greenhouse gas emissions by developed nations and their historic contributions to climate change has proven highly controversial in international climate negotiations. Developing nations and many commentators demand that developed nations, who have achieved their advanced status thanks to the plentiful burning of fossil fuels, bear greater financial responsibility for climate change.³¹³ It would seem reasonable, therefore, to assume that a climate rating framed in terms of a company’s contribution to climate change would have a significant impact on investment. Retail investors, however, seem to care relatively little about corporate contributions to global warming. Of all treatment conditions in Experiment 2, the “Contribution to Climate Change” rating prompted the smallest increase of investment in the most climate-friendly stock. This finding suggests that, for most investors, profit motives still prevail over moral considerations such as equity or justice. Average investment of \$1,594.65 (SD=1,264.74) in the stock with the most favorable “Contribution to Climate Change” rating represents a gain of \$150.58 or 10% compared to the \$1,444.07 of average investment in the control condition; this difference, however, did not reach statistical significance ($p=.30$).

313. See, e.g., Shyam Saran, *Paris Climate Talks: Developed Countries Must Do More Than Reduce Emissions*, GUARDIAN (Nov. 23, 2015), <https://www.theguardian.com/environment/2015/nov/23/paris-climate-talks-developed-countries-must-do-more-than-reduce-emissions> [<https://perma.cc/NG2T-G68U>] (highlighting the responsibility borne by developed countries whose historic emissions have contributed disproportionately to global warming and climate change).

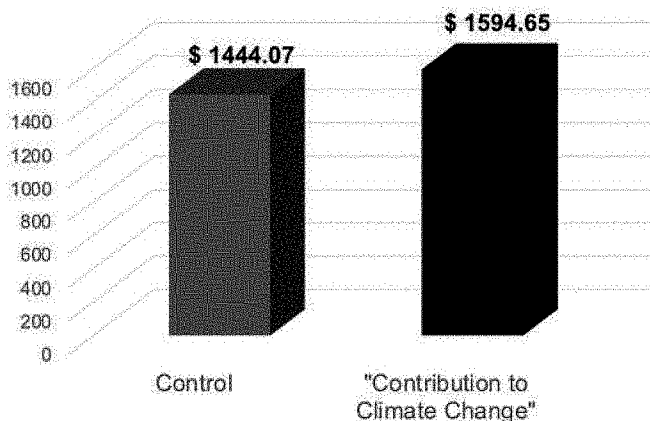


Figure 8: Mean investment in “Contribution to Climate Change” condition

The “Global Warming Pathway” format championed by CDP fared only slightly better, raising average investment in the stock with the lowest global warming pathway to \$1634.40 (SD=944.19) for a gain of \$190.33 or 13% over the control condition; the observed effect was marginally significant ($p=.11$). This less-than-impressive investor mobilization may be explained by the well-documented lack of familiarity with the Celsius temperature scale among large portions of the U.S. population.³¹⁴

314. See, e.g., Eugene Y. Chan, *Climate Change Is the World’s Greatest Threat—in Celsius or Fahrenheit?*, 60 J. ENV’T PSYCH. 21 (2018) (presenting empirical evidence that the choice of temperature scale in presenting global warming data influences peoples’ belief in and concern over climate change). For a more general account of the cultural and other challenges associated with effective communication of climate-related information, see Sander L. van der Linden et al., *How To Communicate the Scientific Consensus on Climate Change: Plain Facts, Pie Charts or Metaphors?*, 126 CLIMATIC CHANGE 255 (2014).

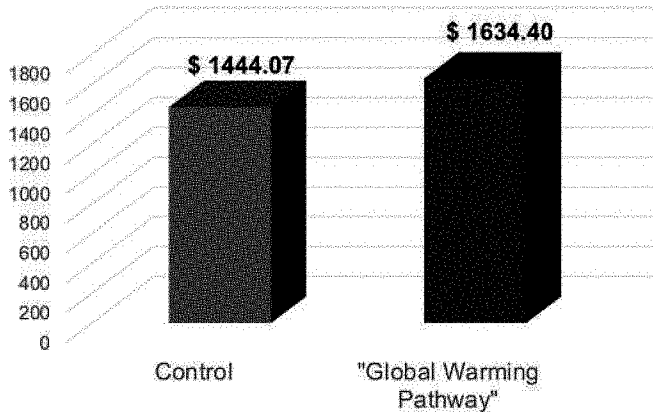


Figure 9: Mean investment in “Global Warming Pathway” condition

The rating labeled “Vulnerability to Climate Change” delivered by far the greatest spike in climate-conscious investment, leading participants to invest, on average, \$2,243.46 (SD=1,348.24) in the company with the most favorable climate rating. Compared to a mean investment of \$1444.07 in the control condition, the vulnerability rating prompted a stunning increase of \$799.39 or 55% of average investment; this effect is highly statistically significant ($p < .001$). This finding confirms that investors care deeply about the climate risk exposure of their potential investment targets, adding further support to initiatives to promote more, and better, disclosure of climate-related risk on capital markets.³¹⁵

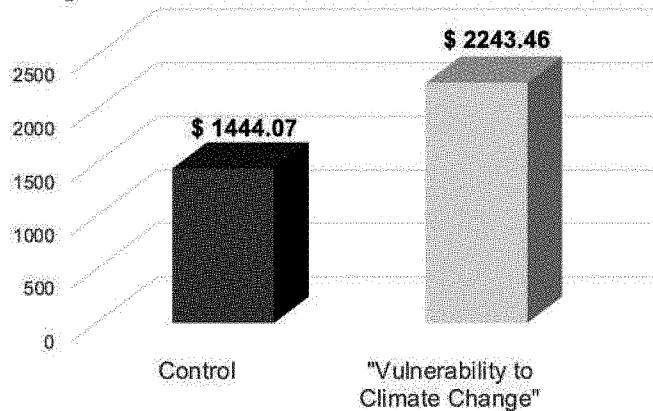


Figure 10: Mean investment in “Vulnerability to Climate Change” condition

315. See *supra* Part I.A.

3. Controlling for Individual Characteristics

The observed climate ratings effect holds for both the generically labeled “Climate Rating” condition and the “Vulnerability to Climate Change” condition after controlling for a set of standard individual characteristics—*Gender, Age, Education, Income, Understanding of Financial Products, Stock Market Participation, Environmental Concern, and Political Views*.³¹⁶ Tables 2 and 3 report regression estimates of these variables on climate-friendly investment, i.e., the average additional investment in the most climate-friendly stock, compared to the control condition. *Vulnerability* and *Climate Rating* are indicator variables set to one if the individual was randomly assigned to the “Vulnerability to Climate Change” or “Climate Rating” condition, and zero for the control condition. Column (1) reports that the average additional investment in the most climate-friendly stock is \$799.38 for the *Vulnerability* condition and \$291.80 for the *Climate Rating* condition, out of \$5,000 invested. In columns (2) to (9), we include the aforementioned demographic variables one by one to control for heterogeneous individual characteristics. The additional investment in the most climate-friendly stock is stable and varies only slightly across these specifications, from \$772.81 to \$827.48 for the *Vulnerability* condition and from \$261.15 to \$296.23 for the *Climate Rating* condition. Column (10) includes all control variables simultaneously.

316. For details regarding the definition of these individual characteristics and their coding, see *infra* Appendix: Definition of Variables.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Vulnerability	799.38*** (154.55)	797.44*** (154.67)	779.26*** (153.37)	827.48*** (153.73)	772.83*** (154.87)	798.76*** (165.95)	800.80*** (154.73)	781.96*** (154.65)	772.81*** (155.48)	774.88*** (154.05)
Female		-134.67 (156.73)								-235.90 (160.26)
Age			12.65 (6.45)							13.41* (6.70)
Education				-38.05 (58.64)						-84.59 (64.89)
Income					25.67 (24.47)					36.23 (27.01)
Understand Fin. Products						24.97 (82.31)				9.16 (89.52)
Stock Market Participant							142.59 (184.28)			47.63 (195.59)
Environmental Concern								21.49 (15.43)		19.97 (18.64)
Political Views									-46.25 (62.98)	-18.65 (73.92)
Intercept	1444.07*** (108.09)	1501.38*** (127.07)	963.38*** (275.00)	1617.30*** (287.68)	1291.50*** (194.00)	1367.57*** (274.47)	1333.34*** (179.41)	971.51*** (355.99)	1590.90*** (209.14)	726.98 (723.07)
N	184	184	183	183	183	184	184	184	183	182
Adj. R-sq.	0.123	0.122	0.133	0.130	0.120	0.119	0.121	0.128	0.117	0.138

Note: Standard errors in parentheses. *p<0.10; **p<0.05; ***p<0.01

Table 2: Regression analysis for “Vulnerability to Climate Change” condition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Generic Climate Rating	291.80** (135.78)	296.23** (134.01)	271.05** (135.93)	293.55** (136.25)	278.95** (135.87)	285.85** (136.05)	294.31** (136.47)	275.04** (136.07)	278.85** (136.16)	261.15** (135.59)
Female		-333.91** (135.22)								-235.90 (160.26)
Age			4.50 (5.53)							13.41** (6.70)
Education				15.30 (53.09)						-84.59 (64.89)
Income					-16.11 (21.85)					36.23 (27.01)
Understand Fin. Products						-63.09 (73.38)				9.16 (89.52)
Stock Market Participant							40.30 (156.47)			47.63 (195.59)
Environmental Concern								18.25 (13.57)		19.97 (18.64)
Political Views									19.10 (53.43)	-18.65 (73.92)
Intercept	1444.07*** (97.01)	1586.16*** (111.69)	1283.19*** (237.56)	1374.41*** (260.55)	1565.08*** (173.05)	1637.37*** (244.87)	1412.78*** (155.64)	1042.81*** (313.65)	1405.39*** (180.25)	726.98 (723.07)
N	192	192	191	192	191	192	192	192	191	191
Adj. R-sq.	0.019	0.044	0.015	0.014	0.014	0.017	0.014	0.023	0.012	0.045

Note: Standard errors in parentheses. *p<0.10; **p<0.05; ***p<0.01; †p=0.056

Table 3: Regression analysis for “Climate Rating” condition

D. Insights, Caveats, and Suggestions for Future Research

Our findings offer strong evidence that corporate climate ratings can nudge retail investors to make more climate-friendly investment choices.

This climate ratings effect, first observed in Experiment 1, persisted in Experiment 2 even after our modifications mitigated the potential impact of visual saliency and the “bank money” effect.³¹⁷ Our data also offers a cautionary tale insofar as the effect varies depending on the framing and display format of ratings. While we observed higher average investment in the most climate-friendly stock across all four treatment conditions of Experiment 2 (Fig. 11), this effect was statistically significant only for the two conditions where climate-relevant information was presented using the labels “Climate Rating” and “Vulnerability to Climate Change.”

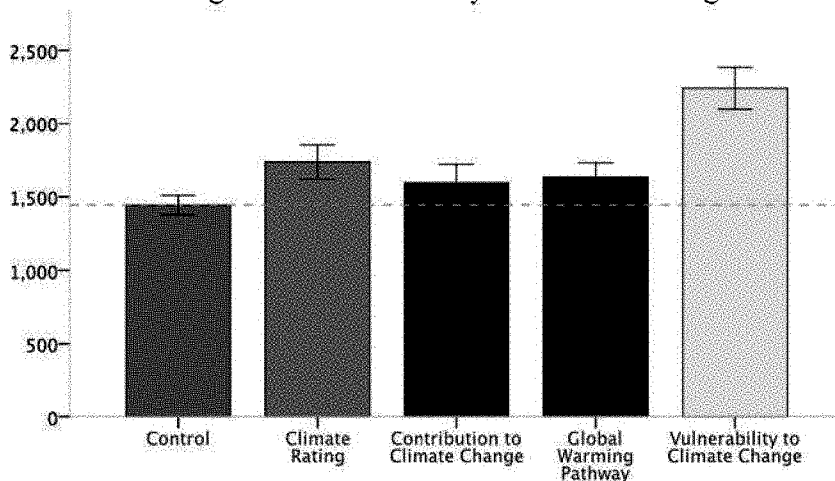


Figure 11: Comparison across conditions in Experiment 2³¹⁸

Our evidence regarding the import of presentation and framing of climate-relevant financial information is consistent with the literatures on behavioral economics, behavioral finance, and climate communication. Behavioral economics has long recognized that the multitude of ways in which information and options can be presented to decision-makers affect their eventual choices.³¹⁹ More recently, research in the emerging field of behavioral finance has demonstrated how the presentation of financially

317. See *supra* Figure 7 and accompanying text.

318. The dashed horizontal gray line uses the control condition’s investment of \$1,444.07 as a point of reference to illustrate the additional investment in treatment conditions.

319. See, e.g., Eric J. Johnson et al., *Beyond Nudges: Tools of a Choice Architecture*, 23 MKTG. LETTERS 487 (2012) (surveying the research on the impact of information presentation on consumer choices); Paul H. Dolan et al., *Influencing Behaviour: The Mindspace Way*, 33 J. ECON. PSYCH. 264 (2012) (cataloging ways in which informational factors affect behavioral outcomes).

relevant information affects investor decision making.³²⁰ The literature on climate communication, finally, has repeatedly highlighted the challenges associated with presenting complex climate-related information in an intuitive format accessible to a non-expert audience.³²¹

The Task Force on Climate-Related Financial Disclosures frequently emphasizes the growing investor demand for “decision-useful” information but offers little, if any, guidance what that information is and how it should be presented.³²² Drawing on insights from the three aforementioned literatures, future research should continue to test the efficacy of corporate climate ratings depicted in various formats to ensure that these ratings deliver critical, climate-related financial information to investors in an easy-to-understand format. Otherwise, well-meaning but less-than-intuitive efforts, such as CDP’s global warming pathway format depicted in degrees Celsius, run the risk of confusing investors, rather than helping them make more climate-friendly choices.

So far, we have demonstrated the potential of corporate climate ratings as well as the importance of, and challenges associated with, their proper design. Turning from design to implementation, two further caveats are in order. First, if raters of corporate climate risk and governance indeed follow in the largely unregulated footsteps of credit rating agencies,³²³ they will need to build reputational capital.³²⁴ Just as rating agencies owe their existence to

320. See, e.g., Bazley et al., *supra* note 305 (offering empirical evidence of how the use of red color in stock charts changes investor behavior); Doellman et al., *supra* note 238 (demonstrating how investors’ allocation of retirement savings among mutual funds is affected by the order in which funds are listed).

321. See, e.g., Richard Black, *No More Summaries for Wonks*, 5 NATURE CLIMATE CHANGE 282 (2015) (criticizing the IPCC’s failure to communicate climate-related information directly and effectively to policymakers and the public); David V. Budescu et al., *Improving Communication of Uncertainty in the Reports of the Intergovernmental Panel on Climate Change*, 20 PSYCH. SCI. 299 (2009) (offering recommendations for more accessible communication of climate information); van der Linden et al., *supra* note 314 (suggesting that climate-related information is best communicated via “a short, simple message that is easy to comprehend and remember”).

322. See TASK FORCE ON CLIMATE-RELATED FIN. DISCLOSURES, *supra* note 76, at 4–5 (commenting that not enough companies are disclosing decision-useful climate-related financial information).

323. For a primer on the lack of regulatory guidance for the operation of credit rating agencies and related reform proposals, see Hill, *supra* note 210; see also Stephen Choi, *Market Lessons for Gatekeepers*, 92 NW. U. L. REV. 916, 934 (1998) (noting the critical role Standard & Poor’s and Moody’s play in financial markets despite operating “without any regulatory intervention”); Partnoy, *supra* note 207, at 628–36 (offering a review of the literature on the “reputational capital” view of credit rating agencies).

324. For a general discussion of the importance of reputational capital for third-party certification providers, see Ronald J. Gilson, *Value Creation by Business Lawyers: Legal Skills and Asset Pricing*, 94 YALE L.J. 239, 288–93 (1984).

information asymmetries between issuers of debt and investors, so too will climate rating agencies fill information gaps in capital markets by providing accurate, not readily available information to investors.³²⁵

In the context of financially relevant corporate climate data, this will require gathering, decoding, and recoding information from a variety of sources into a single, consumer-friendly format.³²⁶ In the constantly evolving scientific and policy landscape of climate change, the task of informational gap-filling will be neither easy nor cheap.³²⁷ Credit rating agencies fund their analytics by charging issuers of debt fees that the latter pay willingly in order to receive better terms (and favorable regulatory treatment³²⁸) as they raise capital on financial markets. Raters of climate risk and governance will likely face some difficulties, at least in the near term, of persuading publicly traded companies to pay for a climate rating that may, or may not, increase the investor appeal of their securities. Our data indicates that investors deem the information contained in a climate rating valuable, suggesting the same should, eventually, be true of companies. Other third-party certifications, such as the costly yet popular LEED certification for buildings or the growing market for certified-organic food, give cause for cautious optimism that enough companies will recognize the benefits of a climate rating to pay the fees necessary to fund the research and analysis of rating agencies.³²⁹ As more and more companies begin to offer climate ratings, market pressure on others to do the same is expected to increase. At the same time, fear of the fallout from a negative climate rating will likely provide additional motivation for carbon-intensive companies and other laggards to take more decisive climate action. Before such a race to the top can truly take off, however, patience and significant up-front investment will be needed to develop a sustainable business model for raters of corporate climate risk and governance.

325. See, e.g., Susan M. Phillips & Alan N. Rechtschaffen, *International Banking Activities: The Role of the Federal Reserve Bank in Domestic Capital Markets*, 21 *FORDHAM INT'L L.J.* 1754, 1762–63 (1998) (“[C]redit rating agencies enhance the capital markets infrastructure by distilling a great deal of information into a single credit rating for a security.”).

326. See George G. Triantis & Ronald J. Daniels, *The Role of Debt in Interactive Corporate Governance*, 83 *CALIF. L. REV.* 1073, 1110 (1995) (describing the task of credit rating agencies and other securities analysts as “decoding ambiguous signals”).

327. See Phillips & Rechtschaffen, *supra* note 325, at 1762–63.

328. See *supra* note 226 and accompanying text (describing the regulatory privileges that federal law attaches to investment-grade ratings for publicly traded debt instruments).

329. See generally Ozge Suzer, *A Comparative Review of Environmental Concern Prioritization: LEED vs Other Major Certification Systems*, 154 *J. ENV'T MGMT.* 266 (2015) (providing an introduction to the benefits and costs of LEED certification viewed in comparative context); Luanne Lohr, *Implications of Organic Certification for Market Structure and Trade*, 80 *AM. J. AGRIC. ECON.* 1125 (1998) (providing a primer on the market dynamics underlying the certification of organic food).

The second caveat relates to the well-documented criticisms leveled against the ethics of nudges such as the proposed ratings of corporate climate risk and governance. Opponents condemn nudges as paternalistic interventions with potentially adverse effects on the autonomy and welfare of stakeholders.³³⁰ Proponents emphasize the overall choice-preserving nature of nudges, classifying them as a libertarian form of paternalism,³³¹ albeit with limited success at persuasion.³³² The autonomy-reducing paternalism critique cannot, however, be extended to educative nudges, such as climate ratings that provide stakeholders with decision-relevant information packaged in an intuitive format. Such open-ended nudge interventions arguably increase both the autonomy and welfare of stakeholders who are empowered to make more informed choices. The ethical case for these educative nudges is even stronger to the extent that they seek to remedy externalities and other market failures.³³³ With their profoundly negative impact on social welfare, environmental externalities—like the greenhouse gas emissions that drive global warming—represent one of the most challenging market failures of our time. Accordingly, even the most fervent nudge critics would likely struggle to discredit the externality-oriented, educative ratings of corporate climate risk and governance proposed in this Article.³³⁴

330. See, e.g., Joshua D. Wright & Douglas H. Ginsburg, *Behavioral Law & Economics: Its Origins, Fatal Flaws, and Implications for Liberty*, 106 NW. U. L. REV. 1033 (2012); Jeffrey J. Rachlinski, *The Uncertain Psychological Case for Paternalism*, 97 NW. U. L. REV. 1165 (2003); Claire A. Hill, *Anti-Anti-Anti-Paternalism*, 2 N.Y.U. J.L. & LIBERTY 444 (2007); Edward L. Glaeser, *Paternalism and Psychology*, 73 U. CHI. L. REV. 133 (2006).

331. See, e.g., Cass R. Sunstein & Richard H. Thaler, *Libertarian Paternalism Is Not an Oxymoron*, 70 U. CHI. L. REV. 1159 (2003); Colin Camerer et al., *Regulation for Conservatives: Behavioral Economics and the Case for Asymmetric Paternalism*, 151 U. PA. L. REV. 1211 (2003).

332. See, e.g., Gregory Mitchell, *Libertarian Paternalism Is an Oxymoron*, 99 NW. U. L. REV. 1245 (2005); Heidi M. Hurd, *Fudging Nudging: Why Libertarian Paternalism Is the Contradiction It Claims It's Not*, 14 GEO. J.L. & PUB. POL'Y 703 (2016); MARK D. WHITE, *THE MANIPULATION OF CHOICE: ETHICS AND LIBERTARIAN PATERNALISM* (Palgrave Macmillan 1st ed. 2013).

333. See STEPHEN BREYER, *REGULATION AND ITS REFORM* 15 (Harv. Univ. Press 1984) (discussing the widespread consensus regarding the legitimacy of government intervention in response to market failures).

334. See generally Brian Galle, *Tax, Command . . . or Nudge?: Evaluating the New Regulation*, 92 TEX. L. REV. 837, 878–92 (2014) (making a persuasive case for greater reliance on “climate nudges”).

CONCLUSION

In his seminal work on the efficient market hypothesis, Nobel Laureate Eugene Fama described the core mission of financial markets as allocation of the economy's capital stock, with accurate price signals guiding the allocation of resources by investors and companies.³³⁵ Without a meaningful price on carbon, financial markets produce price signals that fail to properly account for climate change and its dramatic social welfare costs. As a result, capital continues to flow freely toward fossil fuels and other carbon-intensive assets, exacerbating rather than combating global climate change.

In the absence of government guidance, a trifecta of private ordering efforts is trying to mobilize capital markets as a force for good in the war on carbon. But shareholder climate activism, calls for better climate-related financial disclosures, and the divestment movement have all failed to usher in a new era of low-carbon capitalism that prioritizes climate-friendly options over carbon-intensive assets.

This Article makes the conceptual and empirical case for using corporate climate ratings to catalyze more carbon-conscious investment. Independent ratings of companies' exposure to climate risk, their mitigation strategies, and related opportunities offer valuable information to guide investors toward more climate-friendly assets, for the dual benefit of the investor's bottom line and the environment. Modeled after the ratings of creditworthiness that have long informed capital allocation on financial markets, our proposed climate ratings build on methodology familiar to companies and investors alike. Unlike most reform proposals, corporate climate ratings are available here and now without the need for government intervention or authorization. Climate ratings further amplify the abatement incentives provided by carbon pricing and other climate policies, all while creating much needed common ground amidst the growing partisan polarization of climate action.

Most law review articles would have ended here. But we did not want readers to simply take our word for the viability of our proposal. So we tested, and demonstrated, the existence of a climate ratings effect on capital allocation through a series of incentivized survey experiments conducted with over fifteen hundred participants. Our data provides strong evidence that inclusion of a climate rating among the performance metrics considered by investors significantly increases investment in the stock of companies with favorable climate ratings, even when other stocks boast stronger performance data. We further find that, consistent with insights from behavioral economics and finance, the magnitude of the climate ratings effect depends on the

335. Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383, 383 (1969).

framing and format of ratings. This variance enables us to offer initial recommendations for best practices along with suggestions for future research.

Appendix: Definition of Variables

Climate Variables	Definition
Generic Climate Rating	Indicator variable equal to one if participant was randomly assigned to Generic Climate Rating condition, zero otherwise.
Vulnerability to Climate Change	Indicator variable equal to one if participant was randomly assigned to Vulnerability to Climate Change condition, zero otherwise.
Contribution to Climate Change	Indicator variable equal to one if participant was randomly assigned to Contribution to Climate Change condition, zero otherwise.
Global Warming Pathway	Indicator variable equal to one if participant was randomly assigned to Global Warming Pathway condition, zero otherwise.
Control (No Climate Information)	Indicator variable equal to one if participant was randomly assigned to Control condition, zero otherwise.

Dependent Variable	Definition
Share Allocation	Dollar amount invested in stock with most favorable climate rating.

Control Variables	Definition
Female	Indicator variable equal to one if participant is female, zero otherwise.
Age	Continuous variable measuring age of participant.
Education	Categorical variable based on highest level of participant education: 1. Some high school; 2. High school graduate; 3. Some college; 4. Associate degree; 5. Undergraduate degree; 6. Master's degree; 7. Doctoral degree; 8. Professional degree (JD, MD).
Income	Categorical variable based on participant income: 1 if less than 10,000; 2 if \$10,000-19,999; 3 if \$20,000-29,999; 4 if \$30,000-39,999; 5 if \$40,000-49,999; 6 if \$50,000-59,999; 7 if \$60,000-69,999; 8 if \$70,000-\$79,999; 9 if \$80,000-\$89,999;

	10 if \$90,000-\$99,999; 11 if \$100,000-\$149,999; and 12 if above \$150,000.
Understanding of Financial Products	Participants were asked “How well do you understand financial products?” and responded on a 5-point Likert scale from 1=“Not at all” to 5=“Completely”.
Stock Market Participant	Indicator variable equal to one if participant reported investing in the stock market, zero otherwise.
Environmental Concern	Six-item version of the New Environmental Paradigm scale ³³⁶ , a widely accepted set of questions designed to capture respondents’ attitude toward the environment, where each item is scored from 1=“Not at all concerned” to 5=“Very concerned”.
Political Views	Categorical variable based on responses to question “How would you describe your political views?” where 1=“Very Liberal”, 2=“Somewhat Liberal”, 3=“Neutral”, 4=“Somewhat Conservative” and 5=“Very Conservative”.

336. See Riley E. Dunlap & Kent D. van Liere, *The “New Environmental Paradigm”*, 40 J. ENV’T EDUC. 19 (2008); Riley E. Dunlap, *The New Environmental Paradigm Scale: From Marginality to Worldwide Use*, 40 J. ENV’T EDUC. 3 (2008).