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ESG Performance and Disclosure: A Cross-Country Analysis

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Florencio Lopez-de-Silanes
SKEMA Business School and NBER
Joseph A. McCahery
Tilburg University and ECGI
Paul C. Pudschedl
Tilburg University

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Abstract

We use a unique dataset to examine the link between ESG disclosure and quality through a cross-country comparison of disclosure requirements and stewardship codes. We find a strong relationship between the extent of ESG disclosure and the quality of a firm's disclosure. Furthermore, we find that ESG is correlated with decreased risk. This result suggests that firms with good ESG scores are simply disclosing more information. Finally, we show that ESG scores have little or no impact on risk-adjusted financial performance.

Keywords: ESG, Sustainable Finance, Stewardship Codes, Financial Performance, Disclosure

JEL Classifications: G12, G14, G15, G23, G32, M1, M2, M4

Florencio Lopez-de-Silanes
Professor of Finance
SKEMA Business School
60 Rue Dostoievski
Sophia Antipolis, 06902, France
phone: +33 493 953 201
e-mail: florencio.lopezdesilanes@skema.edu

Joseph A. McCahery*
Professor of Law
Tilburg University, Tilburg Law School
Prof. Cobbenhagenlaan 221
5037 DE Tilburg, Netherlands
phone: +31 13 466 2306
e-mail: J.A.McCahery@Tilburguniversity.edu

Paul C. Pudschedl
External PhD
Tilburg University, Tilburg Law School
Prof. Cobbenhagenlaan 221
5037 DE Tilburg, Netherlands
e-mail: P.C.Pudschedl@tilburguniversity.edu

*Corresponding Author

TILBURG UNIVERSITY

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Florencio Lopez-de-Silanes,

Joe McCahery, Paul C. Pudschedl

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Florencio Lopez-de-Silanes,* Joseph A. McCahery,** and Paul C. Pudschedl***

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*SKEMA Business School and NBER,
**Tilburg University, TILEC, and ECGI,
***Tilburg University, TILEC, and University Wiener Neustadt

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I. Introduction

Corporate sustainability represents a growing concern for both institutional investors and regulators because of the significance of environmental, social and governance (ESG) factors in investment decisions and future portfolio performance. This coincides with major changes in the pattern of investments around the world. For example, the growth rate of sustainable investments under management in the United States increased from USD 8.7 trillion to USD 12 trillion between 2016 and 2018.[1] Similarly, the impact of the growth of US and European-oriented ESG funds increased 44% between 2014 and 2018.[2] Despite the recent slowdown of investment flows in 2018, ESG-oriented funds are expected to continue growing their assets under management and also to allocate their flows to different types of investment options.[3]

In response to the rapid increase in ESG investments, a policy debate has emerged about whether to introduce mandatory corporate reporting on corporate sustainability issues. Until recently, various national and industry bodies have considered approaches ranging from incorporating ESG into voluntary investor stewardship codes to requiring institutional investors and companies to disclose ESG-related data. On the one hand, various voluntary comply-or-explain disclosure measures were introduced in some countries in Asia and

[1] US SIF, "Report on US Sustainable, Responsible and Impact Investing Trends 2018" (2018), available at https://www.ussif.org/files/Trends/Trends%202018%20executive%20summary%20FINAL.pdf.
[2] Morningstar, "The Evolving Approaches to Regulating ESG Investing" (2019) https://www.morningstar.com/lp/esg-regulation.
[3] FT, "ESG Money Market Funds Grow 15% in First Half of 2019" (14 July 2019), available at https://www.ft.com/content/2c7b8438-a5a6-11e9-984c-fac8325aaa04.

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Europe. In France, the new reporting measures are applied to institutional investors to measure the extent to which ESG issues are integrated in their investment and voting decisions. The main aim of these voluntary measures is to enhance awareness of ESG issues and elaborate best practices for institutional investors. On the other hand, recent studies have begun to dispute the effectiveness of comply-or-explain reporting of ESG investments that is limited or not directly comparable across jurisdictions.[4] In this context, the UK's Financial Reporting Council has revised its Stewardship Code to integrate ESG issues—including climate change—that institutional investors are expected to consider in their investment, monitoring and voting activities, while ensuring that their investment decisions are aligned with client needs.[5] To achieve these goals, the ESG factors have become material for investors.[6] As such, this may reflect the new Code's attempt to improve the impacts of business activities on non-financial stakeholders—first, by mitigating negative environmental and social externalities, and second, by possibly mitigating systemic risks by giving institutional investors better information regarding firm ESG factors and encouraging more active corporate governance engagement with the environmental and social aspects of their investments.[7]

[4] OECD, "Investment Governance and the Integration of Environmental, Social and Governance Factors" (2017), available at https://www.oecd.org/finance/Investment-Governance-Integration-ESG-Factors.pdf.
[5] UK Financial Reporting Council (FRC), "UK Stewardship Code of 2020" (24 October 2019), available at https://www.frc.org.uk/investors/uk-stewardship-code. The revised UK Stewardship Code allows the FCA to investigate concerns that asset managers are ignoring trustee ECG policies and voting instructions. See, eg, FT, "Pension Trustees Test UK's Revamped Stewardship Code" (4 November 2019) available at https://www.ft.com/content/93007a0f-62d1-4369-be76-4d9262be687c.
[6] See, e.g., Mozaffar Khan, George Serafeim, Aaron Yoon, "Corporate Sustainability: First Evidence on Materality" (2016) 91 The Accounting Review 1697.
[7] IPE, "FRC Reworks Stewardship Definition in More Demanding Code" (24 October 2019), available at https://www.ipe.com/countries/uk/frc-reworks-stewardship-definition-in-more-demanding-code/www.ipe.com/countries/uk/frc-reworks-stewardship-definition-in-more-demanding-code/10034074.fullarticle.

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But do these sustainability investments have value implications for future financial performance? Two opposing views exist with respect to the relationship between ESG investments and financial performance. One stream of literature has shown a weak or negative correlation with the financial performance of ESG funds.[8] This view holds that one reason for holding inefficient investments could be the investors' utility of holding high-quality ESG investments. Interestingly, some recent studies have found evidence of a positive effect of ESG filters on returns.[9] However, other research shows that institutional investors can use increasing ESG scores to manage portfolio risk, particularly in more volatile capital markets such as that of the US.[10]

To address these conflicting views, we analyze the link between ESG disclosure and the ESG quality through a cross-country comparison encompassing countries with varying ESG disclosure requirements and stewardship codes. Our analysis considers the potential relationship between ESG and firms' financial performance across these countries.

Our results show a strong relationship between the extent of ESG disclosure and the quality of a firm's disclosure. The results provide statistically significant evidence that ESG is correlated with decreased risk. However, most of this relationship can be attributed to the fact that firms are simply disclosing more information, while the actual quality of the firms' ESG

[8] See, Arno Riedl and Paul Smeets, "Why Do Investors Hold Socially Responsible Mutual Funds?" (2017) J Fin 2505. See, also, Luc Renneboog, Jenke ter Horst, Chendi Zhang, "The Price of Ethics and Stakeholder Governance: The Performance of Socially Responsible Mutual Funds" (2008) J Corp Fin 302.
[9] Benjamin R. Auer and Frank Scuhmacher, "Do Socially (Ir)responsible Investments Pay?: New Evidence from International ESG Data" (2016) Q J Econ Fin 51. See, also, Tim Verheyden, Robert G. Eccles, Andreas Feiner, "ESG for All? The Impact of ESG Screening on Risk, Return, and Diversification" (2016) 28 J App Corp Fin, available at http://doi.org/10.1111/jacf.12174.
[10] Christina E. Bannier, Yannik Bofinger, Bjorn Rock, "Doing Safe by Doing Good: ESG Investing and Corporate Social Responsibility in the U.S. and Europe," available at https://www.uni-giessen.de/fbz/fb02/fb/professuren/bwl/bannier/team/190424ESGPaper.pdf. See, also, Dan Hanson, Tom Lyons, Jennifer Bender, Bruno Bertocci, Bobby Lamy, "Analysts Roundtable on Integrating ESG into Investment Decision-Making" (2017) J App Corp Fin, available at http://doi.org.10.1111/jacf.12232.

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factors are of less importance. Furthermore, there appears to be little to no impact on risk-adjusted financial performance due to ESG factors. Overall, our results can be taken as an indication that companies with higher ESG disclose more data; they also provide further evidence on the relationship between sustainability and superior financial performance.

The remainder of the paper proceeds as follows. Section II reviews the relevant literature on ESG disclosure requirements and investment performance. Section III discusses the methodology and data. Section IV examines the relationship between ESG disclosure and a company's ESG metrics, as well as investment performance volatility and risk-adjusted returns. Section V concludes.

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II. Background and Literature Review

With the increased interest of institutional investors in integrating ESG factors into their asset allocations, asset managers must consider how mandatory ESG disclosure requirements for companies or ESG-related stewardship codes for investors can improve overall ESG quality, as well as what the corresponding impact on firms' financial performance will be.

The previous literature found mixed evidence that, under certain conditions, environmental, social, and governance criteria are individually correlated with firms' positive financial performance; however, the literature on ESG-focused mutual fund performance has shown that ESG funds tend to underperform the market. Other studies have argued that ESG criteria can be used as part of portfolio design for superior risk-adjusted returns under certain circumstances.

This section begins with a brief overview of recent trends in ESG-related disclosure rules and stewardship codes. This has motivated our research questions regarding the relationship between a firm's level of ESG data disclosure and the quality of ESG, as well as whether ESG disclosure and quality have an impact on firms' financial performance. We then discuss the difficulty in measuring and comparing ESG data between firms. In the third part of this section, we provide a review of the relevant theoretical and empirical literature on ESG factors and financial performance.

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II.A. ESG disclosure requirements and stewardship codes

We begin by providing a brief overview of the varying disclosure requirements and stewardship codes in relation to ESG. We consider a range of such regimes from non-mandatory disclosure with no effective stewardship code in the US, mandated disclosure requirements in France, the UK situation of a voluntary stewardship code with a comply-or-explain provision which was developed and continues to evolve through an iterative dialogue between regulators and investors, and "transplanted" stewardship codes in Australia and Japan.

The United Nations Principles for Responsible Investment (PRI) has spearheaded global efforts for investors to incorporate ESG into investment decisions and actively consider the ESG components of their investments. In addition to supporting companies' positive social and environmental impact, the PRI is also aimed at fostering long-term value creation and reducing systemic market risk.[11] In addition to this global, investor-led approach, various national and advisory bodies have considered approaches ranging from incorporating ESG into voluntary investor stewardship codes to requiring institutional investors and companies to disclose ESG-related data.

In the United States, companies' ESG statistics are generally deemed material and subject to mandatory disclosure only if there is a clear financial consideration. For example, the SEC Guidance on Climate Change Disclosure states that such data should be disclosed if they relate to a company's "financial condition, liquidity and capital resources, changes in

[11] See Principles for Responsible Investing (PRI), https://www.unpri.org/.

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financial condition and results of operations."[12] There have been some increased efforts to get the SEC to adopt widespread mandatory and standardized disclosure requirements related to ESG information.[13] Many large institutional investors, academics, lawyers, and proxy advisors backed a rulemaking petition to the SEC;[14] however, the US House of Representatives Financial Services Committee roundly rejected legislative proposals to require widespread ESG disclosure by companies.[15] Meanwhile, a new bill was recently passed by the Financial Services Committee that, if passed by the House, would require public corporations to disclose ESG information in their proxy statements.

In the EU, the materiality threshold for ESG disclosures is not necessarily linked to financial considerations, and a company should report any ESG data that are "necessary for an understanding of the development, performance, position and impact of its activity."[16] As expect a number of countries implemented different reporting criteria, which in some cases have increased. For example, Italy not only implemented this EU directive (vis-á-vis D.Lgs. 254/2016) requiring ESG data disclosure as of 2017 for medium and large cap issuers (more

[12] SEC "Commission Guidance Regarding Disclosure Related to Climate Change" (2010), https://www.sec.gov/rules/interp/2010/33-9106.pdf.
[13] See Jill E. Fisch, "Making Sustainability Disclosure Sustainable" (2019), Geo L J 107:923; Hans B. Christensen, Luzi Hail, Christian Leuz, "Adoption of CSR and Sustainability Reporting Standards: Economic Analysis and Review" (2019) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3427748.
[14] SEC "Request for rulemaking on environmental, social, and governance (ESG) disclosure" (2018), https://www.sec.gov/rules/petitions/2018/petn4-730.pdf.
[15] See P Temple-West, "US Congress rejects European-style ESG reporting standards," Financial Times (12 July 2019); and US House Committee on Financial Services, "Building a Sustainable and Competitive Economy: An Examination of Proposals to Improve Environmental, Social and Governance Disclosures" (10 July 2019), https://financialservices.house.gov/calendar/eventsingle.aspx?EventID=404000. Meanwhile, a bill, H.R. 4329, the ESG Simplification Act of 2019, was passed by the House Financial Services Committee on 20 September 2019, but is unlikely to be passed by the U.S. House of Representatives, https://www.lexblog.com/2019/10/13/esg-disclosure-simplification-act-passes-committee-but-will-fail/.
[16] EU Directive 2014/95, of the European Parliament and of the Council of Oct. 22, 2014, Article 1, 2014 O.J. (L 330/1) 1, 5 (EU).

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than EUR 20M in assets or EUR 40M in net sales), but also introduced criteria to distinguish the degree of detailed reporting required based on the type of entity.[17]

Stewardship codes are another approach designed to increase the consideration of ESG criteria by institutional investors. There is some evidence that this can drive improved ESG quality. Dyck et al. (2019) demonstrate that demand by institutional investors for high-quality ESG investments is correlated with increased ESG performance of firms whose equities are held by large institutional investors.[18]

To cite one example, a 2016 French law requires institutional investors to report how they consider the environmental and social governance issues related to their portfolio companies. Article 173-VI of the French "Energy Transition for Green Growth" law, dated January 2016, requires investors to provide a general description of their ESG policies; to describe how they analyze ESG data; and to explain how such measures are incorporated into their investment and risk-management analyses.[19]

Short of the explicit legal requirement of the French law, the UK stewardship code has a comply-or-explain provision that aims to pressure investors to voluntarily disclose how they consider the ESG aspects of their investments.[20] As opposed to a directly legislated approach,

[17] D.Lgs. 254/2016.
[18] Alexander Dyck, Karl V. Lins, Lukas Roth, Hannes F. Wagner, "Do Institutional Investors Drive Corporate Social Responsibility? International Evidence" (2019) J Fin Econ 131:693.
[19] See Principles for Responsible Investing (PRI), "French Energy Transition Law: Global investor briefing on Article 173" (22 April 2016), https://www.unpri.org/policy-and-regulation/french-energy-transition-law-global-investor-briefing-on-article-173/295.article; and Forum pour l'Investissement Responsable (FIR), " Article 173-VI: Understanding the French regulation on investor climate reporting," (October 2016), https://www.frenchsif.org/isr-esg/wp-content/uploads/Understanding_article173-French_SIF_Handbook.pdf.
[20] UK FRC, "The UK Stewardship Code" (September 2012), https://www.frc.org.uk/getattachment/d67933f9-ca38-4233-b603-3d24b2f62c5f/UK-Stewardship-Code-(September-2012).pdf.

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the UK Financial Reporting Council (FRC) in conjunction with the Financial Conduct Authority (FCA) has developed its stewardship code through an iterative discussion and comment process with investors, companies, and other stakeholders. The FRC has, in October 2019, finalized a new, expanded stewardship code to include a wider definition of ESG and to broaden the duty of institutional investors beyond their holdings in listed companies to include their holdings in private equity, venture capital, and other alternative investments.[21]

Australia has ostensibly developed its stewardship code through an iterative dialogue between regulatory bodies and investors. While the process echoes the UK approach, the final product is rather like a transplant of the UK stewardship code - voluntary in nature with a comply-or-explain approach. [22] Australia is even proposing amendments to its stewardship code almost identical to what the UK has recently done.[23] Japan has followed a similar approach of "transplanting" the UK's iterative, voluntary stewardship code with a similar comply-or-explain approach.[24] The high degree of cross-shareholdings among Japanese companies and the large ownership stake of Japanese banks means that there is a significant number of investors not covered by the UK-style stewardship code in Japan; this limits the overall impact of the Japanese stewardship code.[25]

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[21] UK FRC, "UK Stewardship Code of 2020" (24 October 2019), available at https://www.frc.org.uk/investors/uk-stewardship-code

[22] Australian Council of Superannuation Investors, (17 May 2018), "Australian Asset Owner Stewardship code," https://www.acsi.org.au/publications-1/australian-asset-owner-stewarship-code.html

[23] Australian Council of Superannuation Investors, (8 May 2019), "ESG integration and stronger stewardship support long-term value creation," https://www.acsi.org.au/images/stories/ACSIDocuments/MediaReleases/ESG-integration-and-stronger-stewardship-support-long-term-value-creation-May-2019-FOR-IMMEDIATE-RELEASE.pdf

[24] See Japan Financial Services Agency, "Finalization of Japan's Stewardship Code (Revised version)," (May 2017) at https://www.fsa.go.jp/en/refer/councils/stewardship/20170529.html, and related materials at https://www.fsa.go.jp/en/refer/councils/stewardship/index.html

[25] See Rohei Nakagawa, "Shareholding Characteristics and Imperfect Coverage of the Stewardship Code in Japan" (2017), Japan Forum 29:339-353.

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Aside from stewardship codes and mandated ESG disclosure requirements, there is evidence that a more market-based approach may bring about results that improve both ESG quality and firms' financial performance. Barko et al. examine how ESG-mandated activist funds that focus on improving target company ESG criteria can also improve the target companies' financial performance.[26] They find minimal but statistically significant evidence of positive reactions to stock prices after engagement. Yet it is not clear if this is due to the investor engaging in ESG criteria, as the effects on accounting and fundamental financial measures are statistically insignificant. In short, it may simply be that this fund is also good at finding firms with undervalued equities in addition to driving ESG improvement at these companies. So how, then, can investors effectively keep a effective yardstick measure of the ECG data that companies disclose? We highlight several approaches in the next section.

II.B. ESG Indices and Rankings

This section discusses standards for calculating and reporting ESG data, as well as efforts by data providers to compose ESG rankings and ratings.

There are various competing standards for how companies should disclose raw ESG data. The Global Reporting Initiative (GRI) is an UN-affiliated organization (UNEP) that has created "Sustainability Reporting Standards"—guidelines for reporting ESG data.[27] The US-based Sustainability Accounting Standards Board (SASB) has issued 77 industry-specific standards modeled after and aimed to align with the Financial Accounting Standards Board's

[26] Tamas Barko, Martijn Cremers, Luc Renneboog, "Shareholder Engagement on Environmental, Social, and Governance Performance" (2018) available at https://ecgi.global/sites/default/files/working_papers/documents/finalbarkocremersrenneboog.pdf.
[27] GRI Standards, GRI, available at http://www.globalreporting.org/standards (2011).

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(FASB) standards.[28] In addition, the International Integrated Reporting Council (IIRC) propagates an ambitious effort to codify corporate reporting across financial and non-financial factors (including but not limited to ESG data).[29]

Amel-Zadeh and Serafeim noted that a large proportion of investors view lack of data standardization and comparability as a hurdle for examining firms' ESG factors.[30] Specifically, they show the adoption of a single standard would be a precondition to widespread and meaningful use by institutional investors. In part, this may require more data and analysis to determine which ESG criteria are most impactful to long-term firm performance and other non-financial considerations (i.e., environmental and social-sustainability).

Various ESG-focused rating agencies have arisen to fill the need for objective and standardized evaluations of a firm's ESG, allowing investors to evaluate and compare firms along this metric. However, in some ways, this has made the problem even more difficult, as investors are now presented with competing ESG ratings by different data vendors. Furthermore, the literature in this area illustrates some of the difficulties that investors face when considering ESG ratings.

How can we make sense of the different data providers in order to get a good handle on evaluating the different indices and disclosure standards? It is helpful to turn to Eccles and

[28] SASB, Standards Overview, available at http://www.sasb.org/standards-overview.
[29] International Integrated Reporting Council (IIRC), "Towards Integrated Reporting: Communicating Value in the 21st Century (2011).
[30] Amir Amel-Zadeh and George Serafeim, "Why and How Investors Use ESG Information: Evidence from a Global Survey" (2018) Fin Anal J 74:87.

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Stroehle who dichotomize ESG data providers as values-driven or values-oriented, with only little consolidation and convergence over time.[31] Much of the early research sought to show that there is no correlation or agreement among CSR ratings.[32] For instance, competing environmental ratings are strongly correlated.[33] Another example along the same lines is Daines et al., who find little predictive power of corporate governance ratings for performance, but slightly better for ratings based on financial disclosures rather than on qualitative information on corporate governance.[34] Similarly, other scholars, find that ESG ratings are often influenced by market intermediaries and that firm performance often precedes a ratings change, thus making the rating less useful to investors since it conveys only information already absorbed by market prices.[35]

These results may be unsurprising. Indeed, a large part of the problem in comparing ESG ratings is the lack of a consensus as to what is good and the highly subjective assessments by the ESG rating agencies. Furthermore, the lack of a consistent definition of positive sustainability makes it difficult to account for sustainability and empirically compare or test companies on these metrics.[36] However, despite the difficulties and inherent subjectivity in constructing ESG ratings, previous empirical work has found high correlations among the major ESG rating providers despite differing emphases by the data providers.[37]

[31] Robert G. Eccles, Judith C. Stroehle, "Exploring Social Origins in the Construction of ESG Measures" (July 12, 2018) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3212685.
[32] Aaron K. Chatterji, Michael W. Toffel, "How Firms Respond to Being Rated" (2010) Strat Manage J 31:917.
[33] Magali A. Delmas, Dror Etzion, Nicholas Nairn-Birch, "Triangulating Environmental Performance: What Do Corporate Social Responsibility Ratings Really Capture" (2013) Acad Manage Perspect 27:255.
[34] Robert M. Daines, Ian D. Gow, David F. Larcker, "Rating the Ratings: How Good Are Commercial Governance Ratings" (2010) J Fin Econ 98:439.
[35] Jonathan P. Doh, Shawn D. Howton, Shelly W. Howton, Donald S. Siegel, "Does the Market Respond to an Endorsement of Social Responsibility? The Role of Institutions, Information, and Legitimacy" (2009) J Manage 36:1461.
[36] Rob Gray, "Is Accounting for Sustainability Actually for Sustainability …. And How Would We Know? An Exploration of Organizations and the Planet" (2010) Account Org Soc 35:47.
[37] Florencio Lopez-de-Silanes, Joseph A. Mc Cahery, and Paul C. Pudschedl, "Institutional Investors and ESG Preferences," (2019) Working paper.

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II.C. ESG and Investment Performance

In this section, we now consider a theoretical paradigm of firm investments in ESG quality and the reactions of hypothetical investors. We examine the relevant prior empirical literature on ESG criteria and financial performance.

Theory tells us that if firms are investing in ESG with no financial return, this will reduce their profitability and, consequently, the returns available to investors. The theoretical literature on ESG postulates that ESG investments are driven by a subset of investors that have a non-financial component of utility, and these investors are willing to accept lower returns in exchange for investing in securities with strong ESG qualities.[38]

As such, companies investing in ESG criteria will reduce their returns if these expenditures are not also correlated with positive financial returns. This may be the case, for example, if a firm invests in energy-saving technologies to reduce its carbon footprint, and this creates a positive externality of lowering the firm's energy costs. As is often the case, a firm may invest in green technologies with the purely financial motive of reducing costs, but the investment may coincidentally improve its environmental rating. Investors in these funds see positive environmental performance as a sign of a high-quality company.[39] Evidence also suggests that firms with better environmental performance have higher intangible-asset valuations, which may indicate positive technological spillover from green investments.[40] McWilliams and Siegel argue that firm returns from ESG investments follow a concave

[38] Ridel and Smeets, supra note 8 at 2505.
[39] Glen Dowell, Stuart Hall, Bernard Yeung, "Do Corporate Global Environmental Standards Create or Destroy Market Value?" (2000) Management Science 46:1059.
[40] Shameek Konar and Mark A. Cohen, "Does the Market Value Environmental Performance?" Rev Econ Stat 83:281.

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function, and, thus, there is an optimal point at which the benefits (in terms of the decreased cost of capital) from investments in ESG exceed the costs of such investments.[41]

Another possible link between ESG and firms' financial performance may be due to the combined effects of a sufficiently large number of investors acting on a non-financial motive to slant their portfolios towards firms with strong ESG criteria and away from weaker-scoring ESG firms. While these investors are motivated, in part, by non-financial motives, if a sufficiently large number of investors act in a similar fashion, there will be fewer investors willing to hold poor-quality ESG firms. Therefore, it will be harder to diversify the risk of holding these firms, and the investors willing to hold these firms' securities will demand a higher risk premium because of the reduced diversification possibilities. The subset of investors acting this way needs to be just large enough to raise the cost of capital for firms that do not invest in ESG in order to provide such firms with a positive financial incentive to invest in ESG.[42] In other words, investments in ESG increase firms' value by lowering the cost of capital.[43]

Many empirical studies have examined the financial performance of such funds with ESG-related mandates, as well as the impact that screening on ESG factors has on the funds' financial performance; these studies provide a mixed picture. To begin, Hong and Kacperczyk show that funds that shun "sin stocks" suffer lower returns, while Trinks and

[41] Abagail McWilliams and Donald S. Siegel, "Corporate Social Responsibility: A Theory of the Firm Perspective" (2001) Acad Man Rev 26:117.
[42] Robert Heikel, Alan Kraus, Josef Zechner, "The Effect of Green Investment on Corporate Behavior" (2001) J Fin Quant Anal 36:431.
[43] Patrick R. Martin and Donald V. Moser, "Managers' Green Investment Disclosures and Investors' Reaction" (2016) J Account Econ 61:239.

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Scholtens find that investments in "sin stocks" generate superior returns.[44] In another strand of the literature, Martin and Moser[45] argue that the financial benefits to firms investing in being "green" and environmentally sustainable do not exceed the monetary costs, and Baker et al.[46] and Karpf and Mandel[47] find that "green bonds" have lower risk-adjusted returns. Similarly, investors in ESG focused mutual funds earn lower risk-adjusted returns.[48] Meanwhile, Borgers et al. find that green bond funds have generated superior returns over certain periods, and Barko et al. present convincing arguments that ESG-focused activist investors can enhance firms' value.[49] Moreover, several studies claim that firms' superior financial performance is correlated with positive ESG factors.[50] Finally, Friede et al suggest that more studies in the existing literature find a positive link between ESG and financial performance.[51]

Despite the mixed empirical evidence, Amel-Zadeh and Serafeim find that many institutional investors, when considering ESG factors in their investment decisions, are motivated by

[44] Compare Harrison Hong and Marcin Kacperczyk, "The Price of Sin: The Effects of Social Norms on Markets" (2009) J Fin Econ 93:15 with Peter Jan Trinks and Bert Scholtens, "The Opportunity Cost of Negative Screening in Socially Responsible Investing" (2017) J Bus Ethics 140:193.
[45] Martin and Moser, supra note 43.
[46] Malcolm P. Baker, Daniel Bergstresser, George Serafeim, Jeffrey Wurgler, "Financing the Response to Climage Change: The Pricing and Ownership of U.S. Green Bonds" (2018) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3275327.
[47] Andreas Karpf and Antoine Mandel, "Does it Pay to Be Green?" (2017) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2923484.
[48] Renneboog, et al, supra note 8; Reidl and Smeets, supra note 8.
[49] Arian Borgers, Jeroen Derwall, Kees Kodjik, Jeneke ter Horst, "Do Social Factors Influence Investment Behavior and Performance? Evidence from Mutual Fund Holdings" (2015) J Bank Fin 60:112; Barko, et al, supra note 26.
[50] James T. Hamilton, "Pollution as News: Media and Stock Market Reactions to the Toxics Release Inventory Data" (1995) J Envtl Econ Manage 28:98; R.D. Klassen and C.P. McLaughlin, "The Impact of Environmental Management on Firm Performance" (1996) Manage Sci 42:1199; Susmita Dasgupta, Ashoka Mody, Subhendu Roy, David Wheeler, "Environmental Regulation and Development: A Cross-Country Empirical Analysis" (2001) Ox Dev Stud 2:173; Jeroen Derwall, Nadja Guenster, Rob Bauer, Kees Koedijk, "The Co-Efficiency Puzzle" Fin Anal J 15:282; Philipp Krüger, "Corporate Goodness and Shareholder Wealth" (2015) J Fin Econ 115:304.
[51] Gunnar Friede, Timo Busch, Alexander Bassen, "ESG and Financial Performance: Aggregated Evidence from More than 2000 Empirical Publications" (2015) J Sustain Fin 5:210.

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financial performance.[52] Some strands of the literature recognize the need to more closely consider the financial performance impacts of ESG factors at the portfolio level—i.e., portfolio performance depends on how ESG is used in constructing an investment portfolio[53]. These studies find that positive returns from investment depend on how willing a fund manager is to deviate from strict ESG screening criteria. For example, Barnett and Salomon find that the link between performance and ESG depends on how the fund manager uses ESG and that positive returns depend on the usage of ESG criteria to weight portfolios away from poor ESG companies rather than completely excluding them.[54] The resulting connection between ESG and financial performance is also sensitive to the time period and the modeling method used for returns. A common finding among all of these studies is that a positive relationship with financial performance exists only when fund managers are able/willing to deviate from strict ESG screening criteria. For example, Sherwood and Pollard and Hanson et al argue that ESG can be used to diversify risks in portfolio construction.[55] Consistent with that view, Barnett and Salomon, Shafer and Szado, and Hanson et al. find that investors generally view ESG as important in managing tail risks.[56] In particular, Hoepner et al. and Bialkowski and Starks, by examining volatility surfaces such as lower partial standard deviations of returns, find some evidence that ESG factors are negatively related to extreme downside risks.[57]

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[52] Amel-Zadeh and Serafeim supra note 30.
[53] Meir Statman and Denys Glushkov, "The Wages of Social Responsibility" (2008) Fin Anal J 65:33; Christopher C. Geczy, Robert F. Stambaugh, David Levin, "Investing in Socially Responsible Funds" (2005) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=416380; Verheyden, et al, supra note 9.
[54] Michael L Barnett and Robert M Salomon, "Beyond Dichotomy: The Cruvilinear Relationship between Social Responsibility and Financial Performance' (2006) Strat Manage J 27:1101.
[55] Matthew W. Sherwood and Julia Pollard, "The Risk-Adjusted Return Potential of Integrating ESG Strategies into Emerging Market Equities" (2017) J Sustain Fin 8:26; Hanson et al, supra note 10.
[56] Barnett and Salomon, supra note 53; Michael Shafer and Edward Szado, "Environmental, Social, and Governance Practices and Perceived Tail Risk" (2018) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3220617; Hanson, et al, supra note 10.
[57] Andreas G.F. Hoepner, Ioannis Oikonomou, Zacharias Sautner, Laura T. Starks, Xiaoyan, "ESG Shareholder Engagement and Downside Risk" (2018) available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2874252; Jedrzej Bialkowski and Laura J. Starks, "SRI

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This supports our hypothesis that ESG criteria convey some information that relates to financial performance, but not enough to be able to rely on this information as a sole criterion. This is why strict ESG-themed mutual funds tend to underperform the market,[58] despite empirical evidence of positive relationships between ESG factors and financial performance at the level of individual companies.[59]

We also note that the focus of enforcement may differ by jurisdiction and may lead to a de facto standard that diverges from the reading of the regulations. This would lead to variances in investor and company behavior among jurisdictions. Eccles et al. find some evidence that the demand for specific ESG data differs by country, and while this may be due to cultural differences reflecting investor preferences for companies with different ESG characteristics[60], it can also be explained by potential differences in the relevance of E, S, or G characteristics to companies' financial performance.[61] For instance, if different jurisdictions tend to focus more on regulating companies on environmental criteria, then this would affect financial performance more than the other criteria, and investors would be correspondingly more interested in that dimension of ESG data.

Funds: Investor Demand, Exogenous Shocks and ESG Profiles" (2016) Working Papers in Economics 16/11, University of Canterbury, Department of Economics and Finance.
[58] See, eg, Renneboog, et al, supra note 8.
[59] See, eg, Krüger, supra note 50.
[60] Robert G. Eccles, George Serafeim, Michael P. Krzus, "Market Interest in Nonfinancial Information" (2011) J App Corp Fin 23:113.
[61] Lopez-de-Silanes, et al, supra note 37.

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III. Data and Methodology

This section describes our data collection methodology and provides a general description and summary statistics of the data.

III.A. ESG measurements

We use two different variables to measure firm-level ESG criteria: Bloomberg ESG disclosure scores and Sustainalytics ESG rankings.

The Bloomberg ESG disclosure score is not a quality measure and measures only the extent of ESG-related data disclosed by a company. It is a Bloomberg proprietary that ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every ESG-related data point collected by Bloomberg.

Bloomberg states that "each data point is weighted in terms of importance" and "the score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector."[62]

The Sustainalytics ESG quality ranking is "assigned to the company based on its environmental, social and governance (ESG) total score relative to its industry peers."[63] The ranking ranges from 0 for the poorest ESG-quality companies to 100 for the best.

[62] Bloomberg Professional Services, "The Terminal" available at https://www.bloomberg.com/professional/solution/bloomberg-terminal/.
[63] Sustainalytics Ratings and Research, "Understanding Your Company's ESG Ratings" (May 2019) available at https://www.sustainalytics.com/sustainable-finance/2019/04/26/webinar-understanding-esg-risk-ratings-2/.

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Sustainalytics ESG ranking is meant to encompass a company's level of preparedness, disclosure and controversy involvement across all three ESG themes.

The Bloomberg ESG disclosure score measures the amount of ESG data a company reports publicly and does not measure the quality of a company's performance on any data point. However, we believe that part of being a high-quality ESG company is the transparency and disclosure of ESG quality. Furthermore, given the largely voluntary nature of ESG disclosure requirements, as well as the lack of standardization, one of our hypotheses is that there will be a strong correlation between ESG disclosure and ESG quality. Furthermore, the nature of the Bloomberg ESG disclosure score is somewhat more objective, as it does not assign subjective quality judgements to the individual ESG criteria aside from the relative importance of the data point itself and not what constitutes a "good" or "bad" quality.

While the Sustainalytics ESG quality score is widely published and used by industry (as evidenced by its prominence on the Bloomberg Financial Terminal), the ratings contain significant value judgements as to what constitutes a company's "good" or "poor" performance with regard to ESG.[64]

We acknowledge the difficulty in applying rankings to measure ESG criteria; however, we believe that using each of these widely available rankings will provide a good proxy for the overall ESG quality of firms. While there is some difference of thematic emphasis (E vs S vs G) between the ESG rankings from various providers, there is a high degree of correlation

[64] For a discussion of the various conceptual approaches to constructing ESG rankings and understanding divergences among the rankings, see Eccles and Stroehle, supra note 31.

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among them.[65] We are therefore confident in our choice of using only the Sustainalytics ranking in this paper.

III.B Dataset construction

We choose six countries from which to construct a sample set of firms: the United States as the world's largest financial market with a lack of a strong stewardship code or ESG disclosure requirements; the United Kingdom with its iterative, flexible stewardship code with a voluntary comply-or-explain approach; France with a legislative requirement for institutional investors to consider and explain ESG factors related to their investments; Switzerland as a large European financial market outside of the scope of EU regulations and a global-leader in providing ESG products despite low ESG attention from domestic institutional investors[66]; and Japan and Australia for a comparison with two highly-developed Asian-Pacific financial markets. Australia is interesting as a large developed market with a strong Anglo-Saxon tradition related to financial markets and a "transplant" of the UK stewardship code. While Japan is also a highly-developed financial market with strong American and Anglo-Saxon influences, its culture of corporate governance is very different with a high degree of cross-shareholdings and bank ownership. This means that Japan's use of a UK-style stewardship code regime may not be as appropriate as in the UK and Australia.

For each of these countries, we screen the 2015-2018 time period. We choose this relatively narrow time period for three reasons: 1) to be able to ensure the widest coverage of

[65] Lopez-de-Silanes, et al, supra note 37.
[66] Nina Röhrbein, "The Swiss ESG paradox," IPE magazine, June 2012, available at https://www.ipe.com/switzerland-the-swiss-esg-paradox/45760.article

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companies with respect to ESG data points; 2) to control for relatively recent changes in requirements related to ESG disclosure and stewardship codes; and 3) to minimize the effects of changing ESG ranking metrics across time.

We then screen for companies with market capitalizations over 700 million USD—or the local currency equivalent—that have both Bloomberg ESG disclosure scores and Sustainalytics ESG quality rankings available for at least one year during the 2015-2018 period. Furthermore, we eliminate observations where there is insufficient financial or equity price data to calculate our control variables.

Appendix Table 1 shows the variables that we use in our regression analyses, as well as the definitions and calculation methodologies. Table 2 shows the number of companies that survived our screening criteria by country. Table 3 provides univariate summary statistics for the companies in our dataset broken down by country.

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IV. Results

In this section, we describe the results of our analysis.

IV.A. ESG disclosure and quality

We begin by considering the relationship between the extent to which a company discloses ESG data and the actual quality of the company's ESG metrics. In the absence of stringent and standardized disclosure requirements regarding ESG-related data, we expect companies to be more likely to disclose good-quality ESG data. If a company incidentally has good ESG data as a natural result of its operations, then there is a minimal marginal cost to disclose those data, which can make the company more attractive to the subset of investors driven by non-financial motivations to invest in companies with high-quality ESG data.[67] It is also hypothesized in the literature that, given a sufficient number of ESG-driven investors, firms with high-quality ESG characteristics will enjoy lower costs of capital due to a greater number of investors willing to hold securities in such firms and the resulting ease of diversification.[68] In this context, firms with high-quality ESG data have a clear financial incentive to disclose these data in order to reap the benefits of lower costs of capital.

In order to investigate the relationship between ESG disclosure and the quality of a firm's ESG criteria, we regress Bloomberg firms' ESG disclosure scores onto Sustainalytics ESG rankings. We know that both data providers, Bloomberg and Sustainalytics, adjust their scoring by industry and over time; therefore, we control for these effects in our regressions.

[67] Martin and Moser, supra note 42 and Eugene F. Fama and Kenneth R. French, "Disagreement, tastes, and asset prices," (2007) Journal of Financial Economics 83, pp. 667-689.
[68] See Robert Heinkel, Alan Kraus and Josef Zechner, "The Effect of Green Investment on Corporate Behavior," (2001) The Journal of Financial and Quantitative Analysis Vol. 36, No. 4, pp. 431-449.

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We perform this regression for the entire dataset controlling for country effects, and then separately for each of the six countries in our dataset. Table 4 shows the results of these regressions.

Across all regressions, we see a strong positive correlation between the quantity of ESG data disclosed by companies—as measured by the Bloomberg ESG disclosure scores—and the quality of a firm's ESG criteria—as measured Sustainalytics ESG rankings. The magnitude of this correlation tends to be lower in countries with more-stringent ESG disclosure requirements and strong stewardship codes imposing ESG considerations on institutional investors. Hence, we see that in the United States the correlation is greater than one.

One possible explanation is that, in the United States, for example, which has minimal ESG disclosure requirements, companies will be more likely to disclose ESG data when it is of high quality. Alternatively, or additionally, it may be that there is little demand among institutional investors in the US for ESG data. Again, this results in the situation in which companies with good ESG data are more likely to disclose these data in order to appeal to the small subset of investors who demand ESG data; at the same time, however, firms with poor or no ESG data are likely to be shunned by those investors who are motivated by ESG considerations.

If strong stewardship codes require most, if not all, institutional investors to consider ESG criteria, this creates widespread demand for ESG data from institutional investors, and we are likely to see smaller correlation coefficients between disclosure and the quality of ESG. Therefore, we contrast countries such as the US—with the coefficient of 1.3 due to a lack of a strong stewardship code requiring institutional investors to consider ESG information—with

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countries in which stewardship codes are much stronger, such as the United Kingdom and France, where the correlation coefficients are 1.1 and 0.8, respectively. Sufficient demand for the securities of high-quality ESG companies by a large number of institutional investors could create a situation in which companies are forced to disclose ESG information, regardless of its quality, and, consequently, average ESG quality improves over time as companies vie to attract widespread investor interest in their securities.[69]

IV.B. ESG and investment performance

We now consider the relationship between ESG factors and investment performance. Basic finance theory tells us that a firm's expenditures on activities that do not yield positive financial returns will necessarily decrease the firm's value. Thus, we distinguish between two possibilities: companies invest solely to improve ESG criteria; or ESG quality is simply correlated with other company investments and industry characteristics that yield positive returns. If investments in ESG do not produce positive financial returns, then we would expect firms' financial performance to be negatively affected by their investments in loss-generating, ESG-enhancing activities.

Certain firm characteristics may be inadvertently correlated with ESG quality, or it may be the case that unrelated firm investments generate positive ESG-enhancing externalities. For example, empirical evidence supports the supposition of a positive relationship between a firm's environmental quality and its level of intangible assets.[70] This relationship between intangible assets and environmental quality is due, in part, to firms in certain industries (e.g.,

[69] See the cost of capital argument advanced by Heinkel et al, ibid and the empirical evidence on ESG and institutional holdings from Dyck et al, supra note 18.
[70] Dowell et al, supra note 39 and Konar and Cohen, supra note 40.

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internet companies) incidentally having a lower carbon footprint because of the nature of their operations. Furthermore, firms that invest in more-efficient technologies often develop technologies that are not only more cost-effective, but that also have smaller carbon footprints. Thus, ESG enhancement is a positive externality of otherwise non-ESG-motivated firm investments.

Government regulations that impose financial penalties on firms can create financial incentives for firms to invest in ESG criteria. Investors would consider current and expected future environmental regulations and resulting fines for firms with poor environmental criteria when valuing a firm's securities, and, therefore, poor environmental quality would be correlated with negative financial returns[71]. Therefore, even when firms invest in improving their environmental quality aside from positive profit-generating externalities, investors may consider such investments as a hedge by the company against more-stringent environmental regulations being imposed in the future.

In the same vein as the relationship between a firm's environmental quality and performance, a firm may be able to generate positive financial returns, or at least hedge against potential risks, by investing in improving "social" criteria. Doing so would help the firm avoid or limit the risk of controversy and poor publicity (i.e., reputational risk), as well as litigation related to negative "social" behavior, such as discriminatory employment practices, health and safety violations, and labor law violations. Similarly, a firm's investments in better corporate governance structures and mechanisms may enhance its financial performance by reducing the risks of agency problems and rent-seeking behavior by management, as well as the

[71] See empirical evidence by Hamilton, supra note 50, Klassen and McLaughlin, supra note 50, and Derwall, supra note 50.

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possibility of corporate fraud and other scandals, through improved firm governance and oversight. Given the risk-management characteristics or ESG investments, we expect to see a negative relationship between the quality of a firm's ESG characteristics and the riskiness of the firm's value.

IV.B.1. ESG and Volatility

We now examine the effect of ESG criteria on the riskiness associated with investments in the firm, as measured by the volatility of equity prices. If ESG is does, indeed, relate to risk, as hypothesized, we would expect to find a statistically significant relationship with volatility.

Table 5a shows the results of regressions of Bloomberg's ESG disclosure score on annual volatility. We control for firm size using the log of assets, the level of intangible assets using Tobin's Q, and the degree of leverage using debt-to-asset ratios. We additionally control for industry, year, and firm-level effects for the regressions on all datasets. The regression on the combined dataset also controls for country-level effects. We then repeat these regressions using Sustainalytics ESG rankings in place of Bloomberg's ESG disclosure scores; the results of these regressions appear in Table 5b.

As Table 5a shows, we find statistically significant negative relationships between volatility and Bloomberg ESG disclosure scores for the full dataset and for the United States dataset (coefficients of -0.0461 with a standard error of .0.0179 for the full set and -0.0581 with a standard error of 0.0246 for the United States set, both statistically significant at the five-percent level). Coefficients for the datasets of the United Kingdom, Switzerland, Australia, and France are also negative but lack statistical significance.

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The coefficient for the regression on the Japanese dataset shows a statistically significant positive relationship between ESG disclosure scores and volatility (0.0749, with a standard error of 0.0276, with significance at the five-percent level). However, the exceptionally low volatility of the Japanese firms in our sample set (see univariate statistics in Table 3) may explain the opposite relationship between volatility and ESG in Japan.[72] Furthermore, we note that in the regressions, the relationship between Tobin's Q appears different for Japanese firms as for all other firms. While several studies support a link between environmental quality, firm performance, and Tobin's Q[73], ESG rankings in Japan may be dominated by governance criteria, resulting in a different relationship between overall ESG and Tobin's Q than prevails in most other countries. This would, in turn, explain the anomalous relationship between ESG and volatility in our dataset for Japan.

In Table 5b, we see similar results when we use the Sustainalytics ESG quality rankings in place of the Bloomberg ESG disclosure scores. While the negative relationship and statistical significance persists, we find that the magnitude (i.e., absolute value) of the correlation coefficient is lower (-0.0167 for the full dataset with a standard error of 0.0078, and -0.0321 for the United States data with a standard error of 0.0111, with statistical significance at the five-percent level). Coefficients for the United Kingdom's, Switzerland's, and France's datasets are also negative but lack statistical significance. The coefficient for Australia is positive but has high standard error and lacks statistical significance. While the coefficient for Japan is slightly positive (0.0196) and statistically significant at the ten-percent level, the coefficient is close to zero with a high standard error (0.0104). Additionally, with regard to

[72] Cf. Hanson et al, supra note 10, Hoepner et al, supra note 56, and Bialkowski and Starks, supra note 56 have found evidence that ESG is related to extreme downside risk, and, therefore, higher levels of volatility would show a stronger relationship with ESG criteria.
[73] Dowell et al, supra note 39 and Konar and Cohen, supra note 40.

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Japan, we again note (as discussed above) the low range of volatility for the firms in the Japanese dataset, as well as the same inverted relationship between Tobin's Q and the Sustainalytics ESG ranking that we saw with the Bloomberg ESG disclosure score.

We note that, while the direction and statistical significance is the same, there is a greater magnitude (i.e., a higher absolute value of the coefficient) of the relationship between the Bloomberg ESG disclosure scores and volatility than there is between Sustainalytics ESG quality rankings and volatility. This is noteworthy because, even though the two scores are generally correlated, the Bloomberg ESG disclosure score simply measures the amount of ESG data that firms disclose, while the Sustainalytics score is a quality ranking of firms with regard to their ESG characteristics. It is possible that companies that disclose more ESG data experience lower volatilities and that this effect is largely independent of changes in actual ESG quality.

Disclosure itself, ESG or otherwise, may signal that firms are very open and transparent; thus, investors are more certain of these companies' fundamental value, and, thus, there is less volatility in these firms' equity prices. This would mean that the actual effect of ESG on volatility is lower than that measured by the Bloomberg ESG disclosure scores and more in line with what is seen with the Sustainalytics ESG rankings. Alternatively, it may be that there is a time lag between when a firm releases ESG data and when Sustainalytics updates its ESG rankings. The market would then react to changes in ESG quality conveyed by the raw ESG data that the firm discloses before the ESG rankings are updated.

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Our results related to ESG and volatility are broadly consistent with other empirical studies that have found links between firm risk and ESG[74] and with the literature that has found that investors tend to view ESG criteria as important for managing portfolio risk.[75]

IV.B.2. ESG and Risk-Adjusted Returns

The results of our analyses of ESG and firm volatility suggest that ESG may have a small but statistically significant impact on reducing volatility. However, the question remains: does this effect translate into improved financial performance in terms of overall risk-adjusted returns?

As noted, the theoretical literature argues that, if we allow for a subset of investors who are motivated, at least in part, by a non-financial component to their utility functions[76], then we will see that such investors are willing to pay a premium for securities in firms with high ESG quality. This bidding-up of these securities' prices will result in poorer performance of such securities, while arbitrageurs can capitalize on the relative underpricing of securities in firms with poor ESG quality.[77] However, sufficient widespread shunning of poor ESG-quality investments may result in an increased cost of capital for such firms, as investors willing to hold such securities find it more costly to diversify away the firm-specific risks in their portfolios, resulting in those investors demanding a premium for holding such securities.[78] On the other hand, empirical studies focused on ESG-related mutual funds have supported the underperformance hypothesis whereby ESG- focused investors are willing to

[74] Cf. Barko et al, supra note 26, Bialkowski and Starks, supra note 57, and Shafer and Szado, supra note 52.
[75] Cf. Amel-Zedeh and Serafeim, supra note 27 and Hanson et al, supra note 10.
[76] Fama and French, supra note 67.
[77] Hong and Kacperczyk, supra note 40.
[78] Heinkel et al, supra note 68.

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accept poorer risk-adjusted returns in exchange for the non-financial utility of holding high-quality ESG investments.[79]

Given the conflicting theoretical predictions and the mixed results of the previous empirical literature, we expect ESG quality to have no substantial effect on security performance.

In order to investigate the potential relationship between ESG and risk-adjusted returns, we regress ESG rankings on annual security returns (assuming reinvested dividends) while controlling for risk by using annual volatility as a control variable. By using industry dummies, we control for the fact that certain industries have, by their very nature, activities that generate positive ESG externalities. In order to control for leverage, we use a firm's debt-to- assets ratio. We also control for a firm's level of intangible assets by using firms' Tobin's Q ratios.

Table 6a shows regressions using Bloomberg's ESG disclosure scores on financial performance adjusted for risk, as measured by volatility. We perform the regression using our entire sample set controlling for country effects and then separately for each country. All regressions control for industry, year, and firm-level effects. Table 6b repeats these regressions using Sustainalytics ESG rankings instead of Bloomberg ESG disclosure scores.

Comparing the regressions in Tables 6a and 6b, we see that the only statistically significant relationship found between ESG and performance is for the regression with the United States dataset in Table 6a, where we find a coefficient on Bloomberg's ESG disclosure score of -

[79] Cf. Riedl and Smeets, supra note 8, Renneboog et al, supra note 8.

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0.0799 with a standard error of 0.0460 and statistical significance at the ten-percent level. Although the relationship is negative and, therefore, lends some support to the theoretical literature that predicts negative returns as ESG-focused investors pay a premium for companies with high-quality ESG, the effect is small, with such a standard error that the effect is often even closer to zero. Furthermore, we find no statistical significance with the regressions on any other dataset in Table 6a or for the regressions in Table 6b using the Sustainalytics ESG rankings.

As reported above, there is some evidence of a statistically significant relationship between Bloomberg's ESG disclosure scores and risk-adjusted returns, but none when the Sustainalytics ESG quality rankings are used in place of the Bloomberg scores. This may be due to the fact that ESG information takes some time to be absorbed by the market. Thus, by the time that Sustainalytics ESG rankings are updated, any new ESG data is already reflected in security prices. Since there is a strong positive correlation between ESG disclosure and quality, there is support for this hypothesis. However, the alternative hypothesis is that the effect may not be related to ESG, but simply to the fact that companies with higher ESG disclosure scores disclose more extensive data generally (both non-ESG and ESG-related data), and this serves to signal high-quality firms with superior financial performance. This alternative hypothesis is supported by the fact that we have found no statistically significant relationship between Sustainalytics ESG rankings and financial performance. This would also explain the lack of a statistically significant relationship in countries other than the United States, where ESG disclosure is more widespread due to disclosure requirements and stewardship codes. The more "mandatory" nature of ESG disclosure means that it is not only high-quality firms that are disclosing ESG data, and, therefore, the relationship between transparent, lower-risk firms and ESG disclosure scores in the United States is lost in

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jurisdictions where every firm is required (explicitly or implicitly) to disclose ESG information.

Nonetheless, the absence of a strong relationship between ESG and risk-adjusted returns may be due to the fact that the effect becomes more pronounced only during times of high market stress. This conclusion is also supported by prior empirical literature evidencing that ESG is related to extreme downside risk.[80] Otherwise, the limited reduction in volatility is not consistently strong enough to affect risk-adjusted returns across our sample size and time period.

Even though our regressions show only some weak evidence of a connection between ESG and risk-adjusted returns, we do find some compelling evidence of a negative relationship between ESG and volatility, which may mean that there are portfolio diversification benefits from high-quality ESG investments in certain situations. This leaves open the possibility for the creation of portfolios that, over some time, may generate superior financial performance by incorporating specific ESG screening and weighting rules into portfolio construction.[81] Furthermore, this would not be inconsistent with the results of prior empirical studies that found a negative relationship between ESG and performance by examining ESG-focused mutual funds[82] because such funds may not be using optimal ESG screenings and, instead, simply appeal to investors who are willing to accept lower returns in exchange for high ESG quality.

[80] Cf. Hanson et al, supra note 10, Hoepner et al, supra note 57, and Bialkowski and Starks, supra note 57.
[81] Verheyden et al., supra note 9; Barnett and Salomon, supra note 54; Sherwood and Pollard, supra note 55; Statman and Glushkov, supra note 53.
[82] Riedl and Smeets, supra note 8, Renneboog et al, supra note 8.

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V. Conclusion

This article contributes to the current debate about the desirability of introducing mandatory corporate reporting on ESG issues. Using a unique dataset constructed from two commercially available databases, we conduct three sets of tests to examine the link between the extent of the disclosure of ESG quality through a cross-country comparison of varying ESG disclosure requirements and stewardship codes. Our data yield a number of interesting findings. First, we find a strong relationship between the quantity of ESG data disclosed by companies and the quality of this data. Second, the differences across countries seems to be driven by more-stringent ESG disclosure requirements and stewardship codes imposing ESG disclosure. Third, we find evidence that ESG is correlated with decreased risk, though this effect may be due to firms disclosing more information than just the quality of the firms' ESG factors. Finally, we find a negative relationship between ESG and performance in the US, which is consistent with the fact that ESG-oriented investors are willing to pay a premium for high-quality ESG investments.

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Appendix

Table 1

Summaries of the definitions of variables used in our data analysis

Variable	Definition
Bloomberg ESG disclosure score	Proprietary Bloomberg score based on the extent of a company's publicly disclosed ESG data. Scores range from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Bloomberg tailors the scoring to different industries. Bloomberg field: "ESG_DISCLOSURE_SCORE"
Sustainalytics ESG ranking	Sustainaytics assigns a rank to the company based on its total ESG quality relative to its industry peers. Scores range from 0 to 100. Bloomberg field: "SUSTAINAYLTICS_RANK"
log assets	We use the natural logarithm of a company's book asset value in order to control for relative size in our regression analyses. This corresponds to the natural logarithm of the Bloomberg field "BS_TOT_ASSET"
debt to assets	In order to control for leverage, we calculate the ratio of firm debt to the book value of assets. This corresponds to the quotient of the Bloomberg fields "SHORT_AND_LONG_TERM_DEBT" / "BS_TOT_ASSET".
volatility	To measure the risk of holding a company's security, we use historical volatility calculated by Bloomberg as the annualized standard deviation of the relative price changes for the daily closing prices over the previous calendar year. Bloomberg field: "VOLATILITY_360D"
annual total returns	Annual total return of the company's primary security over the previous calendar year assuming reinvested dividends. Bloomberg field: "CUST_TRR_RETURN_ANNUALIZED"
Tobin's Q	We use Tobin's Q to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the replacement cost of the firm's assets. The ratio is computed by Bloomberg as: (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets Bloomberg field: "TOBIN_Q_RATIO"
industry	In our regressions, we use industry dummies based on the Global Industry Classification Standard (GICS) developed by MSCI in collaboration with Standard & Poors (S&P). The GICS classification assigns a sector name to each company according to its principal business activity. Bloomberg field: "GICS_SECTOR_NAME"
market capitalization	We screen for companies using market capitalization. Bloomberg field: "HISTORICAL_MARKET_CAP"

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Table 2

Coverage of Bloomberg ESG disclosure scores and Sustainalytics ESG rankings data by country over the 2015-2018 time period among publicly traded companies with a market capitalization of at least 700 million USD (or local currency equivalent)

	United States	United Kingdom	Japan	Switzerland	Australia	France
Individual firms with market capitalization over USD 700 million (or local currency equivalent)	2700	397	816	150	221	192
...with Bloomberg ESG disclosure score	1600	227	653	58	162	110
...with Sustainalytics ESG ranking	653	111	345	36	75	76
...with both Bloomberg ESG disclosure score and Sustainalytics ESG ranking	597	105	300	35	71	76

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Table 3

Univariate statistics for the variables broken down by each national dataset and the full combined set. The number of observed values in each dataset in parentheses. The values for market capitalization in millions of units of local currency.

Full Set (n=4084)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	27.57	10.85	166.94	10.44	16.16	45.49
annual total returns	6.43	-86.76	287.38	27.23	-34.85	49.27
Tobin's Q	1.94	0.51	20.92	1.51	0.94	4.66
log assets	10.83	5.87	19.50	2.36	7.93	15.35
debt to assets	0.28	0.00	3.89	0.21	0.00	0.60
Bloomberg ESG disclosure score	35.77	2.89	75.62	14.48	14.88	58.68
Sustainalytics ESG ranking	50.83	0.00	100.00	28.02	5.50	94.90

United States (n=2136)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	27.32	10.85	148.42	11.32	15.72	48.23
annual total returns	5.29	-86.60	239.34	28.33	-39.16	48.08
market capitalization	34385	790	737470	61774	4105	136280
Tobin's Q	2.18	0.51	20.92	1.58	0.98	5.19
log assets	9.84	6.35	14.78	1.33	7.89	12.30
debt to assets	0.33	0.00	3.89	0.24	0.02	0.67
Bloomberg ESG disclosure score	31.39	7.85	75.62	14.30	14.82	57.03
Sustainalytics ESG ranking	45.87	0.00	100.00	25.98	5.30	87.50

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United Kingdom (n=390)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	27.80	14.04	166.94	12.61	17.20	45.73
annual total returns	5.46	-73.61	287.38	33.45	-36.95	52.74
market capitalization	22449	1050	279200	36803	2492	95411
Tobin's Q	1.81	0.67	12.30	1.31	0.92	3.64
log assets	9.61	5.99	14.76	1.72	7.63	13.43
debt to assets	0.24	0.00	1.00	0.15	0.00	0.51
Bloomberg ESG disclosure score	43.20	23.55	69.42	9.99	29.34	59.50
Sustainalytics ESG ranking	68.21	0.00	100.00	22.71	23.75	97.34

Japan (n=893)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	30.18	13.60	70.18	7.72	19.23	43.84
annual total returns	8.58	-58.16	118.20	22.59	-19.66	52.96
market capitalization	1437100	93676	26380000	1986600	259970	4700800
Tobin's Q	1.54	0.59	14.25	1.42	0.88	3.07
log assets	14.35	10.42	19.50	1.46	12.31	16.86
debt to assets	0.21	0.00	0.88	0.18	0.00	0.56
Bloomberg ESG disclosure score	36.96	2.89	62.81	13.28	12.81	54.98
Sustainalytics ESG ranking	41.30	0.00	100.00	26.62	1.56	87.19

Switzerland (n=119)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	22.06	11.22	63.41	7.33	13.60	34.49
annual total returns	3.89	-86.76	65.11	22.43	-32.14	37.26
market capitalization	39292	1087	256230	61104	3579	210470
Tobin's Q	2.07	0.88	7.52	1.26	0.95	4.71
log assets	10.19	7.54	13.77	1.70	7.92	13.62
debt to assets	0.19	0.00	0.48	0.14	0.00	0.43
Bloomberg ESG disclosure score	43.36	8.68	65.70	16.14	12.81	64.05
Sustainalytics ESG ranking	66.37	0.00	100.00	29.80	7.32	99.11

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Australia (n=271)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	25.99	13.10	65.30	8.74	16.34	42.26
annual total returns	10.22	-51.57	232.34	27.49	-29.19	52.17
market capitalization	19313	1230	142930	27318	3403	89186
Tobin's Q	1.94	0.75	11.89	1.65	0.96	5.87
log assets	9.52	5.87	13.79	1.58	7.33	13.61
debt to assets	0.26	0.00	0.78	0.15	0.00	0.58
Bloomberg ESG disclosure score	37.80	14.88	63.07	12.60	17.77	58.12
Sustainalytics ESG ranking	59.57	3.17	100.00	25.59	15.40	96.22

France (n=275)

Variable	Mean	Minimum	Maximum	Std. Dev.	5% Perc.	95% Perc.
volatility	24.70	14.10	85.93	7.82	15.87	38.37
annual total returns	6.96	-67.72	87.81	23.32	-34.03	45.35
market capitalization	23739	744	129850	25457	3841	90283
Tobin's Q	1.53	0.79	7.22	0.90	0.95	2.98
log assets	10.31	7.73	14.55	1.48	8.53	13.71
debt to assets	0.26	0.00	0.66	0.14	0.02	0.52
Bloomberg ESG disclosure score	50.13	21.07	67.36	8.93	30.58	61.98
Sustainalytics ESG ranking	80.29	7.41	100.00	20.07	38.80	100.00

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Table 4

Regressions of firms' Bloomberg ESG disclosure scores onto firm Sustainalytics ESG rankings. Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Sustainalytics ESG ranking						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Bloomberg ESG disclosure score	1.3041**	1.3352**	1.1168**	1.4464**	1.4809**	1.1665**	0.8463**
	[0.0233]	[0.0300]	[0.1145]	[0.0548]	[0.0952]	[0.1018]	[0.1373]
year effects	yes	Yes	yes	yes	yes	yes	yes
industry effects	yes	Yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
n	4084	2136	390	893	119	271	275
r-squared	0.5444	0.4987	0.2987	0.4786	0.7766	0.5275	0.2036

* indicates significance at the 10 percent level; ** 5 percent level

Standard errors in appear in brackets below coefficients

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Table 5a

Regressions of firms' Bloomberg ESG disclosure scores onto annual volatility of security returns. Control variables control for size (log of assets), leverage (debt-to-asset ratio), and intangible asset level (Tobin's Q). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual volatility						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
log_assets	-1.4058**	-1.5797**	-2.0907**	-1.4412**	-1.2717	-2.1159**	-0.7108
	[0.2177]	[0.3388]	[0.6917]	[0.3454]	[1.1557]	[0.8008]	[0.5087]
debt_to_assets	4.6772**	2.9709**	16.5959**	3.7340*	18.8112**	12.4518**	3.4373
	[1.0404]	[1.3105]	[5.6945]	[2.1765]	[6.3812]	[5.2059]	[3.9807]
TOBIN_Q	-0.8644**	-0.8781**	-2.9951**	0.4748**	-2.3929**	-1.2394**	-1.5593**
	[0.1438]	[0.1880]	[0.6820]	[0.2306]	[0.9704]	[0.4724]	[0.6291]
Bloomberg ESG disclosure score	-0.0461**	-0.0581**	-0.0719	0.0749**	-0.0581	-0.0224	-0.0415
	[0.0179]	[0.0246]	[0.0967]	[0.0276]	[0.0820]	[0.0754]	[0.0648]
year effects	Yes	yes	yes	yes	yes	yes	yes
industry effects	Yes	yes	yes	yes	yes	yes	yes
country effects	Yes	-	-	-	-	-	-
firm-level effects	Yes	yes	yes	yes	yes	yes	yes
n	4049	2114	387	889	119	265	275
r-squared	0.2841	0.3149	0.2609	0.2493	0.4438	0.3931	0.4252

* indicates significance at the 10 percent level; ** 5 percent level

Standard errors in appear in brackets below coefficients

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Table 5b

Regressions of firms' Sustainalytics ESG rankings onto annual volatility of security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), and intangible asset level (Tobin's Q). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: volatility						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
log_assets	-1.5124**	-1.6744**	-2.1594**	-1.2553**	-1.4704	-2.5439**	-0.9409
	[0.2063]	[0.3184]	[0.6506]	[0.3334]	[0.9883]	[0.7060]	[0.5989]
debt_to_assets	4.7002**	2.8466**	15.9711**	3.3739	18.8391**	12.9010**	2.5632
	[1.0381]	[1.3050]	[5.7007]	[2.1831]	[6.3537]	[5.2248]	[4.9186]
Tobin's Q	-0.8705**	-0.8972**	-2.9867**	0.4016*	-2.3462**	-1.2748**	-1.8456**
	[0.1436]	[0.1870]	[0.6829]	[0.2296]	[0.9645]	[0.4716]	[0.8400]
Sustainalytics ESG ranking	-0.0167**	-0.0321**	-0.0415	0.0196*	-0.0244	0.0302	-0.0012
	[0.0078]	[0.0111]	[0.0345]	[0.0104]	[0.0331]	[0.0241]	[0.0333]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2114	387	889	119	265	275
r-squared	0.2857	0.3226	0.2669	0.2530	0.4615	0.3858	0.4113

* indicates significance at the 10 percent level; ** 5 percent level

Standard errors in appear in brackets below coefficients

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Table 6a

Regressions of firms' Bloomberg ESG disclosure scores onto annual security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), intangible asset level (Tobin's Q), and riskiness (annual volatility). Dummy variables o control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual total returns						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Log assets	1.8710**	2.7636**	2.7371*	0.4342	-4.6718*	2.0427	1.0172
	[0.4026]	[0.6032]	[1.4134]	[0.8010]	[2.4105]	[2.1106]	[1.1571]
Debt to assets	-9.6445**	-8.7422**	-33.3377**	-3.8521	-0.8687	-8.8316	-16.7788*
	[2.0138]	[2.3931]	[12.2845]	[5.2155]	[17.4777]	[14.4565]	[9.4450]
Tobin's Q	4.1737**	5.3730**	6.5407**	1.9534**	-0.5327	2.2478	1.7519
	[0.3109]	[0.4133]	[1.4964]	[0.5987]	[2.3261]	[1.3751]	[1.6049]
Annual volatility	-0.0991**	-0.2324**	0.7624**	0.0198	-1.1006**	0.3073	-0.6816**
	[0.0439]	[0.0567]	[0.1399]	[0.1234]	[0.3101]	[0.2409]	[0.1451]
Bloomberg ESG disclosure score	-0.011	-0.0799*	0.0255	0.0344	0.2488	-0.1122	-0.0625
	[0.0348]	[0.0460]	[0.1990]	[0.0706]	[0.1838]	[0.2075]	[0.1587]
year effects	yes	yes	yes	yes	yes	yes	yes
industry effects	yes	yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	yes	yes	yes	yes	yes	yes
n	4049	2114	387	889	119	265	275
r-squared	0.1847	0.2644	0.2493	0.1594	0.5489	0.1753	0.3742

* indicates significance at the 10 percent level; ** 5 percent level

Standard errors in appear in brackets below coefficients

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Table 6b

Regressions of firms' Sustainalytics ESG disclosure scores onto annual security returns. Control variables control for size (log of assets), leverage (debt to asset ratio), intangible asset level (Tobin's Q), and riskiness (annual volatility). Dummy variables control for year and industry effects in all sample sets. The full set also uses country dummy variables. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in brackets below coefficients.

	Dependent variable: Annual total returns						
	full set	United States	United Kingdom	Japan	Switzerland	Australia	France
Log assets	1.8322**	2.4445**	2.7556**	0.6835	-3.0811	1.712	0.8963
	[0.3798]	[0.5585]	[1.3161]	[0.7709]	[2.1045]	[1.9326]	[1.1193]
Debt to assets	-9.6202**	-8.7163**	-32.9778**	-4.0119	0.3428	-9.3359	-15.963*
	[2.0122]	[2.3982]	[12.3215]	[5.2042]	[17.7505]	[14.5132]	[9.2844]
Tobin's Q	4.1715**	5.3164**	6.5374**	1.8860**	-0.6496	2.1963	1.9093
	[0.3109]	[0.4116]	[1.4962]	[0.5891]	[2.3562]	[1.3705]	[1.6627]
Annual volatilty	-0.0989**	-0.2362**	0.7654**	0.0322	-1.1445**	0.3233	-0.673**
	[0.0440]	[0.0570]	[0.1406]	[0.1231]	[0.3132]	[0.2391]	[0.1436]
Sustainalytics ESG ranking	-0.0025	-0.023	0.0183	-0.0084	0.0444	-0.0339	0.0043
	[0.0165]	[0.0223]	[0.0736]	[0.0302]	[0.0857]	[0.0901]	[0.0645]
year effects	yes	Yes	yes	yes	yes	yes	yes
industry effects	yes	Yes	yes	yes	yes	yes	yes
country effects	yes	-	-	-	-	-	-
firm-level effects	yes	Yes	yes	yes	yes	yes	yes
n	4049	2114	387	889	119	265	275
r-squared	0.1940	0.2637	0.2631	0.1492	0.5564	0.1758	0.3738

* indicates significance at the 10 percent level; ** 5 percent level

Standard errors in appear in brackets below coefficients

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