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Sustainability and Capital Markets—Are We There Yet?
Chris Pinney, High Meadows Institute, Sophie Lawrence and Stephanie Lau, KKS Advisors

An Investor Perspective on the Black Box of Corporate Social Responsibility
Chitru S. Fernando, University of Oklahoma, Vahap B. Uysal, DePaul University, and Amal P. Abeysekera, University of Oklahoma

ESG, Material Credit Events, and Credit Risk
Witold J. Henisz and James McGlinch, University of Pennsylvania

Climate Change Scenario Analysis for Public Market Investors
Casey Clark, Rockefeller Capital Management

Electronic copy available at: https://ssrn.com/abstract=3604421
A growing body of research has extended the analysis of the materiality of environmental, social, and governance (ESG) criteria from the perspective of investors to creditors. Important academic, private sector, and multi-sector research and analysis has demonstrated the link between better management of ESG criteria and more effective management of risk overall. Despite this growing consensus and consistent evidence that ESG performance is correlated with credit risk, no empirical evidence has yet linked ESG performance to cost or expense variances or revenue shortfalls that might explain these correlations.

Using a novel dataset that provides systematic coding of material events reported in the media across a variety of empirical settings, we provide the first large-sample empirical study of the mechanisms that link ESG performance to credit risk. And in so doing, we reveal a number of interesting patterns of variation, both among industries and within individual organizations.

explore the link between ESG criteria and the cost of capital.\(^3\)

Early research exploring the link between ESG performance and credit risk noted that a substantial percentage of bank credit losses in Germany could be traced to environmental risks\(^4\) and that banks that used environmental and social criteria as part of their loan assessment process were more accurate in classifying the risks of loans in their portfolios.\(^5\)

In the United States, scholars have found positive associations

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\(^1\) Mozaffar Khan, George Serafeim, and Aaron Yoon, “Corporate Sustainability: First Evidence on Materiality,” *The Accounting Review*, Vol. 91 (2016); Robert G. Eccles, Ioannis Ioannou, and George Serafeim, “The Impact of Corporate Sustainability on Organizational Processes and Performance,” *Management Science*, Vol. 60 (2014); Tim Verheyden, Robert Eccles, and Andreas Feiner, “ESG For All? The Impact of ESG Screening on Return, Risk and Diversification,” *Journal of Applied Corporate Finance*, Vol. 28 (2016).

\(^2\) Remmer Sassen, Anne-Kathrin Hinze, and Inge Hardeck, “Impact of ESG Factors on Firm Risk in Europe,” *Journal of Business Economics*, Vol. 86 (2016); Guido Giese, Anfred Ossen, and Steven Bacon, “ESG as a Performance Factor for Smart Beta Indexes,” *Journal of Index Investing*, Vol. 7 (2016); Jennifer Bender, Xiaole Sun, and Taie Wang, “Thematic Indexing, Meet Smart Beta: Merging ESG into Factor Portfolios,” Available at SSRN: https://ssrn.com/abstract=3080355 or http://dx.doi.org/10.2139/ssrn.3080355.

\(^3\) Belting Cheng, Ioannis Ioannou, and George Serafeim, “Corporate social responsibility and access to finance,” *Strategic Management Journal*, Vol. 35 (2014); Gordon L. Clark, Andreas Feiner, and Michael Viehs, “From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance,” Available at SSRN: https://ssrn.com/abstract=2508281 or http://dx.doi.org/10.2139/ssrn.2508281; Robert Fernandez and Nicholas Elfner, “ESG Integration in Corporate Fixed Income,” *Journal of Applied Corporate Finance*, Vol. 27 (2016).

\(^4\) R. W. Scholz, Weber Olaf, Stünzi J, Ohiernoth W, and Reuter A, “Umweltrisiken systematisch erfassen /Systematically inventorying environmental risks,” *Schweizer Bank: Monatsmagazin für Führungskräfte aus Bank und Finanz/Swiss Bank: Magazine for Managers in Banks and Finance*, Vol. 10 (1995).

\(^5\) O. Weber, R., W. Scholz, and G. Michalik, “Incorporating sustainability criteria into credit risk management,” *Business Strategy and the Environment*, Vol. 19 (2010).
between environmental criteria and bank’s credit ratings as well as between corporate social responsibility (CSR) practices and ROA, while also finding a negative relationship to loan losses and the cost of capital. Despite this research, sell-side analysts have been relatively dismissive of banks’ disclosures of their ESG or CSR practices.

In recent years, academic scholarship as well as private-sector analysis has sought to overcome or overturn this skepticism among analysts with a series of studies showing that companies with higher ratings on ESG criteria have lower loan spreads, higher credit ratings, and lower credit default swap spreads. A helpful and relatively non-technical summary of this extensive research was compiled by the World Bank.

An important catalyst for turning these findings into improved practice has been the work of the “ESG in Credit Ratings” initiative—a program that has been facilitated by the Principles for Responsible Investment (PRI) in partnership with the United Nations Global Compact and United Nations Environmental Program (UNEP) Finance Initiative with the sponsorship of the Rockefeller Foundation. The three reports issued by the initiative in 2017, 2018, and 2019 identified current practices, gaps, and action areas in a coordinated effort to shift perceptions so as to forge a link between ESG criteria and credit risk among the 149 participating investors with almost $30 trillion in AUM and the 18 participating credit rating agencies. These reports were supplemented by numerous case studies, webinars, and forums.

We provide the first large-sample empirical study of the mechanisms that link ESG performance to credit risk.

These studies and initiatives collectively argue that, given the longer-term horizon of creditors and their focus on downside risk, investors when pricing fixed income securities should, like investors in equities, take account of the risk mitigation benefit from higher ESG performance (or a broader enterprise risk management capability that impacts ESG performance and financial outcomes). While a growing number of studies do find a negative correlation between corporate-level measures of ESG performance and various measures of the cost of capital, no large-sample study has empirically identified the specific material risks that are heightened by weak ESG (risk management) performance and linked those events to credit risk.

At the same time, there is abundant qualitative evidence of companies whose shortfalls in environmental, social, and governance performance have translated into material harm with clearly negative consequences for creditors. Many of these cases include liabilities associated with lawsuits, government regulatory actions, and lost revenue. We are unaware, however, of scholarship that begins with this qualitative evidence and then seeks to analyze the generalizability of those findings in a large sample of fixed income securities. We summarize several elements of such a research program here.

We begin with a series of touchstone case studies drawn from recent headlines in which an organization with relatively weak ESG performance experiences losses in the aftermath of a high profile event related to ESG criteria that, in turn, lead to measurable increases in credit risk. In each case, we begin by quantifying the company’s ex ante performance on ESG

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6. R. Bauer and D. Hann, “Corporate Environmental Management and Credit Risk,” Available at SSRN: https://ssrn.com/abstract=1660470 or http://dx.doi.org/10.2139/ssrn.1660470 (2010).
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8. M. P. Sharfman and C. S. Fernando, “Environmental risk management and the cost of capital,” Strategic Management Journal, Vol. 29 (2008).
9. D. Campbell and R. Slack, “‘Environmental disclosure and environmental risk: Sceptical attitudes of UK sell-side bank analysts,” The British Accounting Review, Vol. 43 (2011).
10. A. Goss and G. S. Roberts, “The impact of corporate social responsibility on the cost of bank loans,” Journal of Banking & Finance, Vol. 35 (2011); M. Nandy and S. Lodh, “Do banks value the eco-friendliness of firms in their corporate lending decision? Some empirical evidence,” International Review of Financial Analysis, Vol. 25 (2012); E. W. Cooper and H. Uzun, “Corporate Social Responsibility and the Cost of Debt,” Journal of Accounting & Finance (2158-3625), Vol. 15 (2015); W. Ge and M. Liu, “Corporate social responsibility and the cost of corporate bonds,” Journal of Accounting and Public Policy, Vol. 34 (2015); S. Polbennikov, A. Desclèse, L. Dynkin, and A. Malits, “ESG Ratings and Performance of Corporate Bonds,” The Journal of Fixed Income, Vol. 26 (2016); S. Chava, “Environmental externalities and cost of capital,” Management Science, Vol. 60 (2014); S. C. Bae, K. Chang, and H.-C. Yi, “Corporate social responsibility, credit rating, and private debt contracting: new evidence from syndicated loan market,” Review of Quantitative Finance and Accounting, Vol. 50 (2018).
11. N. Attig, S. El Ghoul, O. Guedhami, and J. Suh, “Corporate social responsibility and credit ratings,” Journal of Business Ethics, Vol. 117 (2013); A. Desclèse, L. Dynkin, J. Hyman, and S. Polbennikov, “Sustainable Investing and Bond Returns,” Barclays Research, Impact Series, (2016); O. Weber, R., W. Scholz, and G. Michalk, “Incorporating sustainability criteria into credit risk management,” Business Strategy and the Environment, Vol. 19 (2010); V. Cantino, A. Devalle, and S. Flandrino, “ESG Sustainability and Financial Capital Structure: Where they Stand Nowadays,” International Journal of Business and Social Science, Vol. 8 (2017).
12. M. Reznick and M. Viels, “Pricing ESG Risk in Credit Markets,” Hermes Investment Management Report, (2017); K. Nguyen-Taylor, I. Naranjo, and C. Roy, “The ESG Advantage in Fixed Income Investing: An Empirical Analysis,” Calvert Investments, (2015); E. Landry, M. Castillo-Lazano, and A. Lee, “Connecting ESG and Corporate Bond Performance,” MIT Sloan Management School & Breckenridge Capital Advisors Report, (2017).
13. G. Indert and F. Stewart, “Incorporating Environmental, Social and Governance Factors into Fixed Income Investment,” World Bank, (2018).
14. https://www.unpri.org/credit-ratings.
criteria, and then analyze the nature of the adverse event and its material impact on investors and creditors. We then introduce a novel dataset that, to our knowledge, has not heretofore been linked to measures of a firm’s ESG performance—one that allows us, in a series of related research projects, to demonstrate that the patterns observed in these case studies are indeed generalizable. Next, we provide summaries of two recent sponsored research projects at the sector level (one on infrastructure projects and the other on commodity value chains) that link these datasets and whose findings are mutually corroborative. Next, we go beyond the limited scope of coverage of these initial sector-specific studies to show that similar or analogous patterns exist across a wide range of industries using simple scatter-plots and bivariate correlations. Finally, we summarize ongoing research that shows that the same link between ESG performance and credit risk obtained in a sample of 342 firms.

**Touchstone Cases**

**Volkswagen’s Emissions Scandal**
*(TruValue Labs: 58th percentile ESG performance within industry, 27th percentile in air quality)*

In 2015, it was discovered that Volkswagen had been installing software on diesel vehicles that allowed them to pass emission standards tests from 2009-2015. Indeed, they were reported to have been emitting regulated gases at 40 times permitted levels. The U.S. EPA announced on September 18, 2015 that VW had violated the Clean Air Act. On October 16, a federal judge approved a $15 billion settlement between the U.S. and VW, including a buyback program, $2.7 billion for environmental mitigation, and $2 billion for clean-emission infrastructure. Following the EPA violation announcement in September 2015, VW’s credit default swap (CDS) spreads (i.e., a proxy for the probability of default) widened 187% to 216 basis points within three days, and its share price fell 37% over the same three-day period.

**Vale: Iron Ore Tailing Dam Failures at Mariana and Brumadinho**
*(TruValue Labs: 36th percentile ESG performance within industry, 5th percentile on Human Rights & Community Relations)*

On November 5, 2015, Vale experienced a catastrophic failure at its Mariana Dam, in Brazil, which led to the release of 60 million cubic meters of iron waste into the Doce River. Nineteen people were killed and hundreds of community members had to be resettled. As news of the magnitude of the damage and Vale’s potential culpability (given a 2013 internal report that identified structural issues with the dam) spread, Vale’s stock price fell by approximately 25% and its CDS spread increased in price by 62% from 558 to 903 basis points. Twenty-one executives were subsequently charged with homicide. The company was fined $4.8 billion and has been sued for $15 billion but these amounts are still being contested in various appeals and negotiations.

Just over three years later on January 25, 2019, Vale experienced an even worse catastrophic failure at the Brumadinho tailings dam. Over 300 were feared killed with 203 confirmed deaths and over 100 missing. Once again, internal reports (from 2018 and 2009) highlighted a higher than accepted risk of failure at the facility. The company shed 22% of its market capitalization following the event, and its credit default swap spreads rose 65% in price from 129 to 214 basis points. Three court orders froze $2.9 billion of assets, and the company has already agreed to pay a $290 million fine. A federal prosecutor has suggested that he will pursue legal damages in excess of $40 billion, or more than half the company’s market capitalization.

**IOI Corporation Berhad’s Suspension from the Roundtable on Sustainable Palm Oil**
*(TruValue Labs: 2nd percentile ESG within industry, bottom percentile on Biodiversity Impacts & bottom percentile for Environmental & Social Impacts on Assets & Operations)*

After a warning on March 25, 2016, IOI Corporation Berhad in Malaysia was formally suspended from the Roundtable on Sustainable Palm Oil on April 1, 2016. It was found to have illegally cleared 45 square miles of forest and peatland. Following the suspension, Unilever, Mars, Nestle, and Kellogg all suspended their procurement contracts with IOI, contributing to a $42 million negative swing in quarterly net income. The stock price, which had fallen 10% since rumors of the suspension first circulated in March, fell another 10% in the aftermath of the announcement by customers. Prices on the company’s corporate bonds fell 2% and CDS spreads widened 43% to 121 basis points. Moody’s issued a negative outlook for the company on May 10, 2016 and reaffirmed this conclusion two months later.

**Wells Fargo’s Aggressive Sales Practices**
*(TruValue Labs: 35th percentile ESG within industry, 23rd percentile on Customer Welfare)*

In September 2016, Wells Fargo was fined by the Consumer Financial Protection Bureau $185 million as punishment for the creation of 1.5 million unauthorized deposit accounts and 565,433 credit card accounts from 2011-2016. This number was later estimated as high as 3.5 million. Thereafter, Wells Fargo, in private arbitration, paid a total of $142 million to consumers who had accounts fraudu-
lently opened in their names. Then CEO John Stumpf was eventually replaced by Tim Sloan, a longtime Wells Fargo executive (who was himself later fired). In an unprecedented move in February 2018, the Federal Reserve stated Wells Fargo would not be allowed to grow assets past 2017 levels until the bank showed meaningful improvement on the aforementioned issues.

Following the Federal Reserve's announcement in February 2018, Wells Fargo's shares declined 12% over the following week, as compared to a 5.4% decline in the KBW Nasdaq Bank Index over the same period. Its CDS spreads also widened 22% to 49 basis points during this time.

J&J's Talcum Powder
(TruValue Labs: 21st percentile ESG within industry, 18th percentile Product Quality & Safety)

On March 14, 2019, a California jury levied a $29.4 million verdict against Johnson & Johnson, finding in favor of a woman who attributed her development of mesothelioma to Johnson & Johnson's baby powder product. This followed a separate suit in Missouri where several women were awarded a total of $4.69 billion dollars when they argued that the same product caused ovarian cancer. Currently, there are approximately 14,000 similar cases against Johnson & Johnson. On December 14, 2018, Reuters reported that Johnson & Johnson may have known for decades that its powders contained carcinogens. Following this report, J&J shares traded off nearly 17% over the following 10 days, while its CDS spreads widened 71% to 37 basis points.

Boeing and the 737 MAX
(TruValue Labs: 37th percentile ESG within industry, 32nd percentile on Product Quality & Safety)

On October 29, 2018, a Lion Air Boeing 737 Max 8 aircraft crashed 10 minutes after takeoff from Jakarta killing 189 passengers. Less than six months later, on March 10, 2019, an Ethiopian Airlines Boeing 737 MAX 8 aircraft en route to Nairobi from Addis Abba crashed five minutes after takeoff, killing all 157 onboard. While no conclusive finding has been reached as to the cause of either crash, Boeing has since taken responsibility with an early investigative report pointing to software related issues and not pilot error. Specifically, these early reports suggest that higher and more forward placement of new fuel efficient engines increased the risk that the plane's angle of attack could increase to the point that it triggered an aerodynamic stall. Faulty sensors on the plane are thought to have triggered a novel automated intervention to pitch the nose down that the pilots unsuccessfully struggled to override. Critics further allege that updated manuals and training tools provided by Boeing were insufficiently detailed to prepare pilots for such a scenario. Despite at least 11 formal complaints to federal aviation authorities regarding the aircraft, including two unexpected nose dives reported by pilots, the plane continued to operate without significant changes between the two incidents, although software updates were pending review and testing. Following the Ethiopian Airlines incident, the plane was grounded globally. Norwegian Air has already formally requested compensation from Boeing for lost revenue and additional costs caused by the grounding. In the last similar grounding (of Boeing's 787 aircraft in 2013), All Nippon Airways estimated that each grounded plane-week was associated with $1 million of lost revenue. With 350 planes in service, such claims could total billions in potential liability for Boeing. Beyond the immediate demands for compensation, numerous airlines are also considering postponing or canceling their announced purchases of Boeing's best-selling model, placing $633 billion in sales at risk.

After the first crash, Boeing's stock price declined 15% while its CDS spread climbed 17%. A more severe reaction occurred on the fixed income side after the second crash, with a 11% fall in the stock price but a 61% increase in its CDS spreads.

PG&E and the Camp Fire
(TruValue Labs: 29th percentile ESG within industry, 52nd percentile on Accident & Safety Management)

On November 8, 2018, a combination of high wind and low humidity is thought to have caused a PG&E transmission line to trigger the Camp Fire in Butte County, California that ultimately killed 86 individuals, destroyed 14,000 homes and burned 153,336 acres. Victims allege negligence in the company's failure to respond to resident's complaints of witnessing sparks emanating from their transmission lines as well as multiple health and safety code violations by the company. Litigants also note that over 10 years, PG&E has failed to spend $215 million that was authorized to bury transmission lines underground. Potential liabilities from the fire exceeded $30 billion.

In the aftermath of the fire, PG&E's stock price fell from $48.80 to a low of $6.23 while the spread on its credit default swaps increased 163% from 202 basis points to 531. PG&E ultimately declared bankruptcy on January 29, 2019.

Goldman Sachs and the 1MDB Scandal
(TruValue Labs: 41st percentile ESG within industry, 40th percentile systemic risk management)

Goldman Sachs came under scrutiny in 2018 for what has come to be known as the 1Malaysia Development Berhad...
The case studies above and those gathered by the PRI share a common causal path linking ESG performance and credit risk. In each case, substantial unforeseen costs in the form of legal or regulatory liabilities or lost revenue in the form of customer defection attract creditor attention, causing them to increase their perception of the risk of nonpayment. In order to identify whether the patterns observed in these case studies generalize to a larger sample, we rely on data that systematically captures information on such material credit events and is heavily used by investors in fixed income securities.

RavenPack News Analytics (RPNA) 4.0 has been using natural language parsing to code media-reported events from 19,000 distinct news sources from January 2007 to the present. It tracks 194,000 named entities while grouping the media-reported events into 6,985 distinct categories that have been classified into 495 types and 56 groups.

A recent unpublished academic working paper in corporate finance has already shown that event-based data drawn from RavenPack has a material influence on credit risk while a second published paper shows the same for event data drawn from RepRisk. The authors show that shifts for the worse in news sentiment on companies widen their credit default

(1MDB) scandal, whereby those close to former Malaysian Prime Minister Najib Razak siphoned money from Malaysia’s investment fund. The ability to do so was tied to bond issues totaling $6.5 billion organized by Goldman Sachs. On December 17, 2018, Malaysian authorities filed criminal charges against Goldman Sachs, seeking reparations for the $593 million in fees received by the bank for the bond sales in 2012 and 2013. Prior to this, on November 1, 2018, three senior bankers at Goldman were implicated for bribery by the U.S. Department of Justice.

In the time between when three senior Goldman bankers were implicated by the U.S. Department of Justice and when criminal charges were pressed by Malaysian authorities against the firm itself, Goldman Sachs’s share price declined 26%, compared to a 12% decline for the KBW Nasdaq bank index during that time. Its CDS spreads widened 27% to 95 basis points, as compared to Morgan Stanley and JPMorgan Chase, whose CDS spreads widened 25% to 82 basis points and 25% to 61 basis points, respectively.

In addition to these high profile headlines, the ESG in Credit Risk initiative has compiled a set of 14 additional case studies summarized in Table 1, all of which share elements with the high-profile events summarized here.

**Table 1**

| Company                | ESG? | Date   | Summary                                                                 | Impact                      |
|------------------------|------|--------|-------------------------------------------------------------------------|-----------------------------|
| T&D Life Group         | G    | 2/12/16| Full introduction of enterprise risk management practices                | Upgraded A+ to AA-         |
| Lloyd’s of London Ltd. | E    | 10/12/17| Higher losses than peers from Hurricane Harvey suggesting poor environmental risk management | Outlook negative           |
| Wynn Resorts           | SG   | 1/30/18| Reputational and legal/regulatory risks associated with CEO’s alleged sexual misconduct | Outlook negative           |
| Wells Fargo            | SG   | 2/7/18 | Asset growth capped by regulator due to weak governance, compliance, and risk management | Downgraded A to A-         |
| William Hill           | S    | 5/22/18| Government announces 98% reduction in maximum stake allowed on betting    | Outlook negative           |
| Kinder Morgan          | EG   | 8/17/18| Sale of Trans Mountain reduced exposure to environmental protests         | Outlook positive           |
| Toshiba                | G    | 8/29/18| Improved Board Governance                                               | Upgraded BBB- to BB+        |
| Hydro One              | G    | 9/13/18| Government of Ontario intervening in compensation structure via legislative act | Downgraded A to A-         |
| Signet Jewelers        | S    | 10/8/18| Negative customer sentiment due to allegations of swapping out diamonds and employee treatment | Outlook negative           |
| Tahoe Group            | G    | 10/10/18| Lack of transparency in and governance over aggressive sales strategy    | Downgrade B to B- and Outlook negative |
| Kemble Water           | E    | 10/31/18| Water leaks and customer complaints at Thames Water lead to GBP 230 million fine | Downgraded BB to BB-       |
| Yes Bank               | G    | 11/27/18| Concerns on Governance after shake-up of Board of Directors             | Downgrade from BA2 to BA1  |
| Edison International   | E    | 12/3/18| Cumulative exposure to wildfires                                        | Outlook negative           |
| Southern California Edison | E   | 12/3/18| Cumulative exposure to wildfires                                        | Outlook negative           |

The case studies above and those gathered by the PRI share a common causal path linking ESG performance and credit risk. In each case, substantial unforeseen costs in the form of legal or regulatory liabilities or lost revenue in the form of customer defection attract creditor attention, causing them to increase their perception of the risk of nonpayment. In order to identify whether the patterns observed in these case studies generalize to a larger sample, we rely on data that systematically captures information on such material credit events and is heavily used by investors in fixed income securities.

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A recent unpublished academic working paper in corporate finance has already shown that event-based data drawn from RavenPack has a material influence on credit risk while a second published paper shows the same for event data drawn from RepRisk. The authors show that shifts for the worse in news sentiment on companies widen their credit default

15 S. Yang, Z. Liu, and X. Wang, “News Sentiment and Credit Risk Valuation: Evidence from the CDS Market,” Available at SSRN 3220291, (2018); Julian Kobel, Timo Busch, and Leonhardt Jansco, “How Media Coverage of Corporate Social Irresponsibility Increases Financial Risk,” Strategic Management Journal, Vol. 38 (2017).
construction, shutdowns in operation as well as unexpected costs in the form of legal settlements, and regulatory and political intervention—the first of our studies constructed a sample of global projects in which we could explore these relationships quantitatively.

We began with the population of 4,642 infrastructure projects identified in the ThomsonOne DealScan dataset—projects that received $3.2 trillion dollars of credit in the form of project finance facilities. Of these projects, we were able to geocode (i.e., identify the latitude and longitude) of 1,444 projects that received $1.4 trillion in credit. For 255 of these projects receiving $121.5 billion in credit, we were able to identify publicly traded parent companies for which Capital IQ reported the incidence of a number of material events highlighted in news reports. We were interested, more specifically, in knowing the frequency (or annual incidence) events such as halts to operations due to unusual events, inquiries from regulatory agencies, enforcement actions by regulatory agencies, lawsuits or legal issues, and labor-related announcements (e.g., work slowdowns in protest by employees from the affected community).

Our primary analysis compares the annual rate of these events across projects that are more or less geographically proximate to indigenous land claims. As expected, we found a strong positive correlation between geographic proximity and event occurrence (See Figure 1). The range of incidence of these five material events increases by as much as 500%

Figure 1
Higher Annual Incidence of Material Credit Events for Project Sponsors in Closer Proximity to Indigenous Land Claims

Our first use of the RavenPack event data came in two sector-level research projects where an extensive body of qualitative evidence suggests a strong correlation between specific ESG criteria and credit risk.

Indigenous Land Claims, Material Credit Events & Credit Risk

Using extensive reports of indigenous land claims interfering with the process of the development of major projects—resulting in material losses through delays in

16 L. A. Smales, “News sentiment and bank credit risk,” Journal of Empirical Finance, Vol. 38 (2016).
17 M. Lieblum, A. G. Orlof, and D. Neumann, “The tone of financial news and the perceptions of stock and CDS traders,” International Review of Financial Analysis, Vol. 46 (2016).
18 F.-T. Tsai, H.-M. Lu , and M.-W. Hung, “The impact of news articles and corporate disclosure on credit risk valuation,” Journal of Banking & Finance, Vol. 68 (2016).
19 The research summarized here was sponsored by Calvert (Eaton Vance).
20 C. Fredericks, M. Meaney, N. Pelosi, and K. Finn, “Social Cost and Material Loss: The Dakota Access Pipeline,” Available at SSRN: https://ssrn.com/abstract=3287216 or http://dx.doi.org/10.2139/ssrn.3287216, (2018); S. Dorobantu and I. Walter, “The Dakota Access Pipeline Project,” (2018); A. Gedicks, “The new resource wars: Native and environmental struggles against multinational corporations,” Black Rose Books Ltd., (1994), ibid; B. Ganson and A. Wemmann, “Business and conflict in fragile states: The case for pragmatic solutions,” Routledge, (2018).

21 D. M. Franks, R. Davis, A. J. Bebbington, S. H. Ali, D. Kemp, and M. Scurrah, “Conflict translates environmental and social risk into business costs,” Proceedings of the National Academy of Sciences, Vol. 111 (2014); W. J. Henisz, “The New Present Value of Sustainability Initiatives at Newmont’s Ahafo Gold Mine in Ghana,” Wharton School Teaching Case, (2013).
for projects within 10km of an indigenous land claim, as compared to those more than 500km from such a claim.

The next step of our study was to analyze whether project sponsors with higher (or lower) performance on indigenous rights issues—evaluated using subjective ratings—experienced lower incidence of these material events than their lower-rated counterparts while holding constant proximity to indigenous land claims. Across measures drawn from multiple independent private ratings sources (such as MSCI, RepRisk, Sustainalytics, and TruValue Labs) we found a strong moderating role for sponsors’ indigenous rights management capability. Specifically, for the sponsors who were rated poorly on indigenous rights management ability or performance, the incidence of these material events was anywhere from three to 66 times higher, depending on the event type and risk measure. In most cases where companies do a reasonably good job of managing indigenous rights issues, the incidence of these material risks increases less prominently. Although we did not analyze the practices of individual sponsors as part of our study, reports by the raters and NGOs suggest that sponsors’ adherence to international standards such as Free Prior and Informed Consent, and their proactive and substantive engagement with representatives of indigenous communities, including reaching formal agreements with these communities regarding rent sharing.

We next performed the same analysis, but when evaluating the sponsors, we substituted broader measures of social performance than just effectiveness in managing indigenous rights. Here again we found a strong moderating role in which companies with higher social performance scores experienced a smaller increase in the incidence of these material credit events than their counterparts rated more poorly on social performance. The similarity in the reported moderation suggests that stakeholder engagement is the relevant management capability rather than a narrower ability to manage indigenous stakeholder relations. As we would expect to find, companies that are more effective in managing human rights, labor rights, and inclusiveness across their operations also seem better at dealing with indigenous rights issues.

Based on this analysis and the prior literature highlighting a correlation between ESG criteria and credit risk, we further sought to analyze whether creditors to project finance instruments priced in the risk of project delays, regulatory or legal actions, and labor disputes. We found no evidence at the time of the issuance of project finance credit for the 1,444 projects in our study that otherwise identical projects (i.e., controlling for size of the project, the sector, the country, the distribution method, and whether the creditors were subordinated) paid a risk premium. Nevertheless, when we shifted the analysis to include the trades of all corporate bonds issued by publicly traded sponsors of these projects, we discovered some evidence of a risk premium. Specifically, controlling for the size of the parent, the ratio of market capitalization to liabilities, the ratio of sales to assets and its credit rating as well as year fixed effects, corporate bonds of the parent companies of projects that were located within 10 or 50 km of an indigenous land claim had credit yield spreads that were 50 to 60 basis points above peers. Companies with no indigenous concerns in the MSCI database were predicted to have only a 25-30 basis point increase in the cost of capital, but this result was not replicated using the smaller number of parents covered by Sustainalytics, RepRisk, or TruValue Labs. When we expanded the analysis to incorporate the full range of control variables typically used in the literature,23 our sample size shrank from 94 to only 7 parent sponsors. Our results, however, were similar in economic and statistical significance. Unfortunately, these small sample sizes precluded our ability to further analyze whether firms that were better rated on their treatment of indigenous rights or ESG criteria experienced smaller increases in their cost of capital.

**Biodiversity Impacts, Material Credit Events & Credit Risk in the Commodity Value Chain****

Our second study, which was inspired by a growing body of case studies linking environmental stewardship to material outcomes in the commodity value chain,24 constructed a sample of companies in the commodity value chain as well as their creditors in which we could explore these relationships quantitatively.

We began with the population of 4,352 companies involved in a variety of “commodity-based” industries—such as agricultural production of crops (323 companies)

22 S. Dorobantu and K. Oszimkiewska, “Valuing Stakeholder Governance: Property Rights, Community Mobilization, and Firm Value,” Strategic Management Journal, Vol. 38 (2017); C. O’Faircheallaigh, “Negotiations in the Indigenous world: aboriginal peoples and the extractive industry in Australia and Canada,” Routledge, (2015); C. O’Faircheallaigh, “Social Equity and Large Mining Projects: Voluntary Industry Initiatives, Public Regulation and Community Development Agreements,” Journal of Business Ethics, Vol. 132 (2015); C. O’Faircheallaigh, “Aboriginal-Mining Company Contractual Agreements in Australia and Canada: Implications for Political Autonomy and Community Development,” Canadian Journal of Development Studies/Revue canadienne d’études du développement, Vol. 30 (2010); C. O’Faircheallaigh, “Community development agreements in the mining industry: an emerging global phenomenon,” Community Development, Vol. 44 (2013).

23 These include leverage, the ratio of working capital to total assets, the ratio of retained earnings to total assets, the ratio of earnings before interest and taxation to total earnings.

24 The research summarized here was funded by the World Wildlife Fund under a grant from the Gordon & Betty Moore Foundation.

25 T. Whelan and C. Fink, “The comprehensive business case for sustainability,” Harvard Business Review, Vol. 21 (2016).
We started by comparing the annual rate of these events for companies that performed relatively better or worse on various measures of environmental stewardship. We found a strong correlation between higher stewardship ratings and lower probability of these material credit events (See Figure 2). And the incidence of lawsuits or legal and labor relations issues for companies in the bottom quartile of environmental performance was more than twice that experienced by those in the top quartile.

Based on this analysis and the prior literature highlighting a correlation between ESG criteria and credit risk, we further analyzed whether the creditors of these companies priced in the risk of legal actions and labor disputes. We began by examining the credit spread at the time of issuance and found no evidence suggesting that otherwise identical projects (i.e., controlling for size of the project, the sector, the country, the distribution method, and whether the creditors were subordinated) paid a risk premium if they were lower on environmental or ESG criteria.

However, when we shifted the analysis to include the trades of all corporate bonds issued by these companies following the issuance of the agricultural finance facility, or livestock (130); agricultural services (121); forestry (76); fishing, hunting and trapping (29), food and kindred products (1,870); tobacco (36); agricultural chemicals (137); farm machinery and equipment (39); farm product warehousing and storage (7), groceries (369), farm product raw materials (87); farm supplies (34); food stores (427); and eating places (666)—and that were also identified (in the Thomson Reuters Dealscan dataset) as issuing fixed income securities between January 31, 1985 and April 5, 2018. These companies collectively raised over $6 trillion of debt. Of these 4,300 or so companies, we were able to obtain data on some measure of environmental performance for 3,663 of them from RepRisk, 1,938 from Sustainalytics, 1,307 from MSCI-KLD, and 1,289 from TruValue Labs. For 399 companies in our sample, we also obtained data on the incidence of material credit events (such as the annual incidence of halts to operations due to unusual events, inquiries from regulatory agencies, enforcement actions by regulatory agencies, lawsuits or legal issues, and labor-related announcements, typically strikes or slowdowns). For a much smaller sample of 64 companies, we were able to obtain daily bond trading data...

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However, when we shifted the analysis to include the trades of all corporate bonds issued by these companies following the issuance of the agricultural finance facility,
we discovered some evidence of a risk premium. Specifically, controlling for traditional measures of risk26 as well as year and firm fixed effects, companies in the top quartile of environmental or biodiversity performance had credit yield spreads that were 20 basis points below their counterparts in the bottom quartile. These results should, however, be viewed with caution since, because of data limitations, they are based on the corporate bonds of only 13-19 companies. (Figure 3 summarizes this relationship by plotting the expected natural log of the credit yield spread for a corporate bond issued by a firm in agricultural supply chain with varying levels of performance on TruValue Labs Biodiversity score, conditional on the other factors described above.)

We undertook a similar analysis of the impact of the environmental and biodiversity ratings of a given creditor’s portfolio of corporate borrowers on the credit default swap spreads of the creditor’s bonds. Once again, we found that a shift from the 25th to the 75th percentile in the average environmental or biodiversity rating of a creditor’s borrowers was associated with significantly lower risk. But, again, these results should be interpreted with caution, since only 8%-12% of the borrowers could be rated on their environmental or biodiversity performance, and only 26 banks were included in the analysis. (Figure 4 summarizes this relationship by plotting the expected credit default swap spread for banks with various weighted average borrower scores on biodiversity as measured by TruValue Labs conditional on the factors listed above.)

Subsequent analysis revealed that the biodiversity and environmental ratings of companies in the commodity value chain were highly positively correlated with a number of ESG risks. This pattern of correlations suggests that biodiversity risk, rather than independently and directly related to material credit events and the cost of capital, serves as a proxy for the effectiveness of borrowers’ enterprise risk management practices. Some companies in the commodity value chain do a better job of managing nontraditional financial risks and, as a result, are less likely to experience unexpected negative financial shocks that threaten their ability to meet bond payments in a timely manner or, in the extreme, threaten bankruptcy.

**Broader Trends Not Black Swans or Special Cases**

Building on the evidence from these touchstone cases as well as quantitative sector-level studies, we next extended the same logic to a broader sample of 342 companies from 13 industries, excluding financial services, over the period 2009 to 2017. The sample of companies was composed of the largest (by revenue and market capitalization) nonfinancial corporations operating in each industry globally during the periods when such companies were covered by ESG ratings. The companies for each industry were selected using data from Statista, Fortune’s Global 500, and Forbes’ Global 2000, and were cross-referenced with industry-specific sources (such as Medical Device and Diagnostic Industry Online). We also expanded the set of

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26 The size of the parent, the ratio of market capitalization to liabilities, the ratio of sales to assets, leverage, the ratio of working capital to total assets, the ratio of retained earnings to total assets, the ratio of earnings before interest and taxation to total earnings and its credit rating.
RavenPack events to a total of 30 distinct groups, 15 of which were negative and 15 positive (see Table 2).

Beginning with exploratory analysis of the bivariate relationship between ESG performance in the previous year and media reported material events, we found clear evidence that higher-performing companies on ESG criteria experienced subsequent lower incidence of these material events (see Figure 5). Companies with lower performance relative to their peers in their industry based on material ESG criteria, as defined by the Sustainability Accounting Standards Board, experienced a higher incidence of the material events plotted here. When we broke apart the results by industry, we observed some important variation in the distribution of statistically significant negative correlations (see Figure 6). And although we focus our description on the correlations for material ESG factors as measured by TruValue Labs, we note that the results were qualitatively similar when we focused on all ESG factors using TruValue Labs data or on measures from other data providers (results available from authors on request).

Just as the ESG factors that are material for a firm differ by industry, the pathways by which these material ESG factors influence credit risk also differ. Negative events are less common for firms with strong ESG performance whereas positive events show a mixed correlation, suggesting that while some unexpected growth does occur for better ESG performers, particularly in aerospace, defense and automobile sectors, overall the more robust result is that higher ESG performers experience fewer events, both negative and positive.

The most common pathway is for higher ESG performers to have fewer negative events that have the effect of reducing revenue, which happens in industries such as infrastructure, medical devices, pharmaceuticals, retail, and technology/media/telecommunications. But such events can also affect production, as in the case of pharmaceuticals, retail, and technology/media/telecommunications—and they can disrupt supply in industries like food & beverage and oil & gas. The next most common pathway is between strong ESG performers and fewer lawsuits (food & beverage, industrials, oil & gas, retail, and technology/media/telecommunications). The transportation sector also tends to be hurt by labor problems (i.e., unexpected strikes and layoffs), technology/media/telecommunications by terminated business contracts, the retail industry by the closing of facilities, pharmaceuticals by reduced patents and negative regulatory events, and the oil & gas sector by industrial accidents.

Turning to positive events, the results are more ambiguous. Aerospace & defense and automotive companies with higher ESG performance report a larger than expected number of new business contracts while automotive firms also receive a boost to their government contracts and revenue. Apart from a greater propensity to enter into joint ventures by industrials and companies in technology, media, and telecommunications, the only other positive correlation is for positive demand in retail. On the other hand, a large number of instances of negative correlations appear.

In sum, these results suggest that higher ESG performers offer fewer surprises or lower volatility rather than fewer negative events and more positive ones.

In our work in progress, we are exploring whether the impact of historic ESG performance on credit risk is moderated by the set of material events reported by RavenPack. That is, we test whether the historic ESG performance scores provide additional information in the prediction of credit default swap spreads and credit yield spreads beyond that provided by their impact in predicting the subsequent incidence of material credit events.

Our findings to date suggest partial moderation. Consistent with prior research, media reported events impact credit risk and some of the variation in these events is explained by variation in ESG performance, but not all. It is important to note that these results are robust to the inclusion of all the
known drivers of CDS spreads in the academic literature. In other words it appears that the ESG performance measures highlighted in our qualitative and sector-specific research are both predictive of material events that influence credit risk and capture additional information beyond the incidence of those events.

We are exploring multiple potential mechanisms behind this additional information content. The most promising
so far is the degree to which managers pursue a more long-term orientation that might support investments with longer payback periods. In preliminary analysis, it does appear that simultaneously taking into account a company’s long-term orientation as measured by analyzing the discount rate it applies to future cashflows\(^\text{30}\) and its ESG performance as predictors of future negative and positive events leads to a substantial increase in the economic magnitude of the predicted impact of negative events’ positive impact on credit risk as well as a substantive negative impact on credit risk for positive events. Furthermore, in such a model, we observe no independent effect for either long-term orientation or ESG performance on credit risk independent of their (improved) ability to jointly predict future negative and positive material credit events.

\(^{30}\) Rachelle Sampson and Yuan Shi, “Are US Firms and Markets Becoming More Short-Term Oriented? Evidence of shifting firm and investor time horizons, 1980-2013,” Available at SSRN: https://ssrn.com/abstract=2837524 or https://dx.doi.org/10.2139/ssrn.2837524, (2018).
Conclusion
A substantial body of academic and private-sector research has sought to make the business case for using ESG criteria when assessing corporate financial performance and value. While much of the early work operated at a very high level by seeking correlations between (portfolios of) better performing companies on ESG criteria and higher financial returns, recent work has tried to identify the mechanisms underlying this relationship. Among the most prominent arguments is a purported link between ESG criteria and difficult-to-measure risk management practices. Under this logic, identifying and managing low-probability risks with the help of environmental, social, and governance criteria is an organizational-level capability that should, particularly over the long term, be correlated with fewer negative surprises. In particular, one might expect fewer accidents, fewer lawsuits from aggrieved stakeholders, less government intervention into management practice, and fewer negative surprises on revenue, sales, and profitability. Earlier studies have established a link between these material credit events and credit risk, and between ESG performance and credit risk. In the research summarized in this article, we present in the form of qualitative, single-industry, and large-n research the first link between ESG performance, material credit events, and credit risk.

In future work, we will seek to better identify the mechanisms underlying this correlation and the specific management practices or incentives that allow some firms to achieve better ESG performance, a lower incidence of material credit events, and lower credit risk. Our intuition and preliminary analysis suggest that incentives for managers to take a longer-term orientation play an important role. We hope that this initial research will spur other academics and practitioners to probe these relationships and uncover ways of strengthening corporate ESG performance, reducing negative credit events, and limiting credit risk so as to improve both social and economic outcomes.

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