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Market Manipulation and ESG Incidents

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Market Manipulation and ESG Incidents *

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Market manipulation and ESG incidents

Abstract

Market manipulation are deliberate actions that affect trading activity and corporate policies. We conjecture that market manipulation has unintended consequences also for the ESG policies of the firm. Based on an international sample of monthly data from 2007 to 2018, the data indicate that the presence of market manipulation in a stock increases the probability of ESG incidents by the firm in the ensuing year by more than 1%. We present evidence that this effect is driven by the three channels: financial frictions, business risk, and employment changes. The findings are robust to numerous checks and different fixed effects structures. We also mitigate the endogeneity concerns by using a quasi-natural experiments that improved transparency in difference-in-difference research design.

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1. Introduction

Prior research has provided much evidence on the causes and consequences of stock market manipulation (marking the close, spoofing, wash trades, prearranged trades, insider trades, etc.), including but not limited to the regulatory deficiencies and stock liquidity (Allen and Gale, 1992; Comerton-Forde and Putnins, 2011, 2014; Aghanya et al., 2020; Putnins, 2020). Prior research has likewise identified many causes and consequences of environmental, social, and governance (ESG) successes and failures (Berg et al., 2020; Krueger et al., 2021). Both research areas have significant social value and policy implications, as the harms to stock manipulation and ESG violations are enormous. We also address the important issue that regulatory changes that improve transparency have important externalities (Bonetti et al., 2022).

In this paper, we consider for the first time whether these seemingly unrelated areas of research on stock manipulation and ESG incidents are connected. Prior literature that connects different types of misconduct shows that wage theft precedes financial misconduct while the theft is undetected, but once firms are caught engaging in wage theft they are more likely to shift to engaging in financial misconduct (Raghunandan, 2021). Firms that engage in greenwashing often have more violations. Raghunandan and Rajgopal (2021) show that publicly listed signatories of the Business Roundtable (BRT) statement commit environmental and labor-related compliance violations more often. Akey et al. (2021) show that firms' RepRisk reputation ratings decline significantly following the disclosure of a breach. However, there is no evidence the relationship between stock market manipulation and ESG incidents. This is important as it might help the regulators to detect not only the market manipulation but also subsequent ESG issues that are typically associated with the ESG violations in the affected firms.

In order to explain how the stock manipulation and ESG issues are related we conjecture several possible channels: financial frictions, business risk, employment turnover, and corporate deception and contagion in misconduct. Market manipulation causes increases in financial frictions and business risk, which in turn affect the ability to fund ESG efforts, and therefore increase the rate of ESG violations. Market manipulation also gives rise to employee turnover, and reduced staffing results in more ESG violation. Market manipulation also enables corporate deception and greenwashing. There can be contagion in misconduct whereby one form of manipulation gives rise to additional forms of corporate misconduct (Agrawal and Cooper, 2015). We discuss these mechanisms and some motivating cases in section 2 of this paper.

To test the proposition that market manipulation gives rise to ESG incidents, in this paper we examine data from 39 countries over the years 2007 to 2018. We merge two primary datasets. The first is the ESG (Environmental, Social and Governance) incidents data from the RepRisk database. RepRisk collects daily indicators of negative ESG-related incidents at the firm level. It conducts daily analysis using AI and machine learning of data in 23 languages obtained from 100,000 public sources. It collects data on reputational, compliance, and financial impacts on a company. The data start in January 2007, with daily granularity covering more than 200,000 public and private companies. Previous literature shows that the RepRisk ESG ratings are correlated with other measures of company ESG profile provided by Asset4 (now Refinitiv), Sustainalytics (now Morningstar) and MSCI (Derrien et al., 2021).

The second major dataset is the SMARTS Inc. data on market manipulation. SMARTS is the leading industry software provider for surveillance in the major stock exchanges around the world, and recently purchased by NASDAQ[1]. It is used in all of the major markets in North America, Europe, and Asia. We use industry measures of manipulation events provided by

[1] https://www.risk.net/awards/5295116/best-market-surveillance-product-nasdaq-smarts

SMARTS. We do not create our own manipulation events but instead we use those that were detected by surveillance staff in the stock markets. We note that not all of these detected incidents resulted in prosecutions, as the level of enforcement varies by country, and the type of enforcement may range from minor warnings to serious financial penalties, bans, sanctions, and jail time. Our concern is not in respect of the timing and politics of enforcement penalties, but instead how the detected incidents of market manipulation relate to unexpected subsequent issues of seemingly unrelated ESG incidents.

The data indicate a statistically significant and economically meaningful impact of market manipulation on ESG incidents. Market manipulations give rise to ESG incidents in subsequent months up to a year later. We also check our results by including additional controls and for longer time periods. The economic significance varies slight depending on the specification. In a simple dummy variable specification for the presence of market manipulation, there is a 5% greater rate of subsequent ESG incidents in the subsequent year relative to the average level of incidents in the data. The data show that the companies in Canada and European Union countries have the strongest economic significance in estimates of the effect of market manipulation events on subsequent ESG incidents.

We assess the impact of potential endogeneity problems by using the regulatory changes that increased firm transparency. For example, in the first quasi-natural experiment we use 2018 MiFID regulatory change. MiFID curtailed the incidence of stock manipulation. We run difference-in-difference tests using the sample of treated (affected by MiFID) and control firms before and after the introduction of MiFID for matched and unmatched samples of firms. We find that there was less ESG incidents after MiFID exogenous shock that curbed stock market manipulation. Second, we use mandatory ESG disclosure requirements. Similarly to Krueger et al. (2021) we show that mandatory ESG regulations is exogenous as the ESG regulations might were not an effect of the rise in ESG incidents. ESG regulation improved

market transparency and reduced market manipulation. We find that it had statistically significant effect on reduction of ESG incidents by 5.2%.

We test for the mechanisms that drive the relationship between stock market manipulation and ESG incidents. We find as expected that all three identified channels are at work so 1) financial frictions, 2) business risk, and 3) employment turnover, however some of them only work through a certain types of ESG incidents.

This paper is organized as follows. Section 2 discusses the economic mechanisms and some motivating cases. Section 3 presents the data. The baseline empirical results are presented in section 4. Section 5 discusses the economic mechanism and Section 6 the heterogeneity. Concluding remarks follow in section 7.

2. Mechanisms and Motivating Cases

There are three direct mechanisms through which market manipulation can influence ESG incidents. First mechanism is through *financial frictions*. Market manipulation hurts ability to fund ESG efforts as manipulation harms equity values and capital raising efforts (Allen and Gale, 1992). Manipulation can hurt capital raising efforts. For example, Bloomberg reports that "*SMBC Nikko's Bond Business Plunges on Market Manipulation Case… The scandal is also hurting its underwriting volume of ESG bonds, which fell 47% to 51 billion yen this year, according to Bloomberg data*."[2] With less ability to finance investment activities, it is possible that the funding necessary to maintain good ESG standards (e.g. the expenditures for workplace safety, investment in improving toxic emissions, among others) will be cut and ESG incidents will rise following the manipulation scandals.

[2] Bloomberg, May 24, 2022 https://www.bloomberg.com/news/articles/2022-05-24/smbc-nikko-s-bond-business-plunges-on-market-manipulation-case

Second mechanism is through the *business risk*. Market manipulation increases the business risk of a firm and therefore its cost of capital (Dhaliwal et al., 2016). Consequently, any potential future investments in the ESG improvements and the maintenance of ESG standards become more costly and the probability of ESG incidents increases.

Third mechanism is through *employment turnover*. Market manipulation curtails staff that enable ESG efforts due to limited attention, distraction, short termism, and staff terminations. News media often report staffing problems followings manipulation scandals. For example, the Financial Times[3] reported that "*Glencore on Tuesday entered guilty pleas to multiple counts of bribery and market manipulation and agreed to settlements of more than $1bn, with the final total expected to be near $1.5bn…. they say criminal convictions — and installation of two compliance monitors by the DoJ for three years — will make it harder for executives to position Glencore as an ESG-compliant investment*". Clearly, the staffing issues following manipulation scandals have the potential to exacerbate ESG incident rates, as illustrated by the Glencore case.

There are additional more general channels through which market manipulation exacerbates ESG incidents. Market manipulation enables corporate deception, which in turn facilitates ESG incidents. For example, it has been reported that overstating other metrics makes it potentially easier to greenwash, which exacerbates subsequent ESG violations.[4] It has likewise been reported that state intervention and global standards are needed to curtail the relation between corporate deception and greenwashing to mitigate ESG violations.[5] Academic work (Gino et al., 2009) and policy reports[6] show there is contagion in misconduct,

[3] Financial Times, May 25, 2022 https://www.ft.com/content/d3d8f7fd-4c73-417e-bd4c-41951a33792f
[4] National Law Review, April 5, 2022 https://www.natlawreview.com/article/sec-announces-2022-examination-priorities-includes-ESG Violations
[5] Foreign Policy, January 10, 2022 https://foreignpolicy.com/2022/01/10/sustainablility-ESG Violations-investing-sec-gensler-greenwashing/
[6] National Law Review January 27, 2022 https://www.natlawreview.com/article/enforcement-climate-changing-ESG Violations-disclosures. See also the documentary film "Collared" which identifies the motive for engaging in corporate misconduct as seeing others getting away with it https://tenorfilms.com/collared/.

as different actors see others engaged in misconduct which makes one think there is not much wrong with it.

3. Data

3.1. ESG incidents

Our dependent variable on ESG (Environmental, Social and Governance) incidents comes from RepRisk dataset. RepRisk collects daily indicators of negative ESG-related incidents at the firm level. It conducts daily analysis using AI and machine learning of data in 23 languages obtained from 100,000 public sources. It collects data on reputational, compliance, and financial impacts on a company. The data starts in January 2007, with daily granularity covering more than 200,000 public and private companies. Previous literature shows that the RepRisk ESG ratings are correlated with other measures of company ESG profile provided by Asset4 (now Refinitiv), Sustainalytics (now Morningstar) and MSCI (Derrien et al., 2021).

RepRisk classifies ESG incidents according to 28 distinct issues. Environmental issues include news about climate change, toxic emission, among others. Social issues include for example child labor, discrimination, and health and safety abuses. Governance issues include for instance anti-competitive practices, executive compensation issues, fraud. It is possible that incident can be associated with multiple issues and belong to two or more E/S/G categories. We summarise the ESG issues and 28 corresponding categories in Table 1.

[Table 1]

In Figure 1 we summarise ESG incidents and market manipulation by year. As expected ESG incidents increase steadily over time from 15,000 to 60,000. The market manipulation

cases are at a stable level from 10,000 to 20,000 cases by year worldwide. This figure alleviates any concerns that might arise about spurious correlation.

[Figure 1]

3.2. Market manipulation

Our measure of market manipulation comes from the SMARTS Inc. dataset. SMARTS is the leading industry software provider for surveillance in the major stock exchanges around the world, and purchased by NASDAQ in 2010. It is used in all of the major markets in North America, Europe, and Asia. We identify stock manipulation when SMARTS software reports manipulation.[7] In order to create the main variable of interest daily incidents are aggregated by month and by firm.

We create market manipulation measures as follows. We sum market manipulation cases identified by SMARTS and aggregate them by month (*Market Manipulation*). We also create a dummy variable that equals to one if there was any stock market manipulation (porice or volume) during a particular month, and zero otherwise (*Market Manipulation_d*). We lag the market manipulation by 6 and 12 months.

3.3 Sample and summary statistics

We match ESG incidents data from RepRisk with stock market manipulation data from SMARTS dataset through international securities identification numbers (ISINs). As a result of matching we obtain an international sample covering 39 countries from 2007 to 2018. We

[7] We do not create our own price and volume manipulation events but instead use those that were detected by surveillance staff in industry. We note that not all of these detected incidents resulted in prosecutions, as the level of enforcement varies by country, and the type of enforcement may range from minor warnings to serious financial penalties, bans, sanctions, and jail time.

start in 2007 as it is the when the first RepRisk data is available, and we only have the data from SMARTS till 2018. The final sample consists of 1,486,213 monthly observations.

[Table 2]

4. Results

4.1 Baseline results

In order to estimate the effect of stock market manipulation on ESG incidents we run a Poisson Pseudo Maximum Likelihood (PPML) model proposed by Santos Silva and Tenreyro (2006), which is applied to deal with corner solution outcomes for a continuous dependent variable that takes the form:

$$ESG\ Incidents_{i,t+} = \alpha + \beta\ Market\ Manipulation_{i,x} + f_i + f_{tci} + \varepsilon_{it} \quad (1)$$

where *ESG Incidents* is the overall level of media and stakeholder coverage of a company related to ESG issues, *Market Manipulation* identifies price and/or volume manipulations that happened at time *x*, where *x* is 6 months or 12 months before or over a 6 months and 12 months period, f_i and f_{tei} are firm and interaction of time *x* industry *x* country fixed effects. W present the results in Table 3.

[Table 3]

In Panel A Table 3 we show the effect of market manipulation measured as a dummy equal to one if there was market manipulation 6 months (*L6.MarketManipulation_d)* or 12 months (*L12.MarketManipulation_d*) before the ESG incident, and zero otherwise. Market manipulation (6-month lag) is associated with a 1) 1.3% increase in ESG incidents relative to the average frequency of ESG incidents in the data, 2) 1.4% increase in environmental

incidents, 3) 1.3% increase in social incidents, and 4) 1.3% increase in governance incidents. Presence of market manipulation (12-month lag) is associated with a 1) 1.1% increase in overall incidents relative to the average frequency of ESG incidents in the data, 2) 1.1% increase in environmental incidents, 3) 1.5% increase in social incidents, and 4) 0.9% increase in governance incidents.

In Panel B Table 3 we show the effect of market manipulation measured as a sum of manipulations that happened 6 months (*L6.MarketManipulation)* or 12 months (*L12.MarketManipulation*) before the ESG incident. We find that a one standard deviation increase in market manipulation (6-month lag) is associated with a 1) 1.1% increase in overall level of ESG incidents relative to the average frequency of ESG incidents in the data, 2) 1.1% increase in environmental incidents, 3) 1.0% increase in social incidents, and 4) 1.2% increase in governance incidents. Subsequently, a one standard deviation increase in market manipulation (12-month lag) is associated with a 1) 1.0% increase in ESG incidents relative to the average frequency of ESG incidents in the data, 2) 0.8% increase in environmental incidents, 3) 1.0% increase in social incidents, and 4) 1.2% increase in governance incidents. The effect is driven by all types of incidents: environmental, social and governance.

In Panel C Table 3 we show the effect of market manipulation that happened over a period of 6 months (*>=1 Market manipulation in the past 6 months)* or 12 months (*>=1 Market manipulation in the past 12 months*) before the ESG incident. We find that a one standard deviation increase in market manipulation over 6 months (*>=1 Market manipulation in the past 6 months*) is associated with a 1) 4.3% increase in overall level of ESG incidents relative to the average frequency of ESG incidents in the data, 2) 3.7% increase in environmental incidents, 3) 4.0% increase in social incidents, and 4) 4.8% increase in governance incidents. Subsequently, a one standard deviation increase in market manipulation over 12 months (*>=1 Market manipulation in the past 12 months*) is associated with a 1) 6.2% increase in ESG

incidents relative to the average frequency of ESG incidents in the data, 2) 5.8% increase in environmental incidents, 3) 5.7% increase in social incidents, and 4) 6.8% increase in governance incidents. The effect is driven by all types of incidents: environmental, social and governance.

4.2 Positive versus negative manipulations

Market manipulation can be value increasing (positive) or decreasing (negative). In Table 4 we compare the effects of those two types of manipulations. We show that they have almost the same statistical significance, albeit with different economic significance. In particular, positive manipulation has a more than twice larger impact on all ESG incidents compared to negative manipulations. Said differently, positive manipulations are associated with larger governance failures, consistent with agency costs of overvalued equity (Jensen, 2005) and with larger environmental and social failures, which is suggestive of a firm's declining ability to support environmental and social efforts when their stock is artificially pushed up.

[Table 4]

4.3 Additional controls and robustness

In the subsequent tests, we add additional controls for the size of the firm (*Size*), its level of cash (*Cash flow*), profitability that we proxy with return on assets (*ROA*), and ability to meet long-term obligations that is measured by shareholders' funds to total assets (*Solvency*). We add them in additional test as we lose a significant number of observations. Adding the additional controls does not change our main results that market manipulation is positively related to ESG incidents.

[Table 5]

In additional set of results, we check the robustness of our results by using long term lags of market manipulation variable. We repeat our baseline tests when we lag he market manipulation by 24 months. Our results still show a positive and statistically significant effect of market manipulation on ESG incidents.

4.4 MiFID

In order to further, strengthen that the ESG incidents follow stock market manipulation and not the other way round we run a quasi-natural experiment where we use as a shock the Markets in Financial Instruments Directive II (MiFID II). MiFID is a financial services directive that came into force in the European Union on January 3, 2018.[8] MiFID II applies to the 31 countries of the European Economic Area (EEA), which comprises the 28 EU members plus Iceland, Liechtenstein, and Norway (PwC, 2016). MiFID improved the transparency of financial markets in EEA and reduced market manipulation. Following Fang et al. (2020) we use MiFID II as a source of exogenous variation in market manipulation for firms located in Europe.

First, we run a quasi-natural experiment where we treat the introduction of MiFID as a shock that reduced market manipulation in order to mitigate the endogeneity concerns. We run a difference-in-difference research design using the sample of treated and control firms for a subsample of 12 months before and after the introduction of MiFID. *TREAT* equals 1 for companies headquartered in EEA countries (i.e., treatment sample) and 0 for companies headquartered elsewhere (i.e., control sample). *POST* equals 1 if the value of the dependent

[8] A directive is a legislative act that sets out a goal that all EU countries must achieve. Each individual member country implements its own laws on how to achieve these goals (https://europa.eu/european-union/eu-law/legal-acts_en). Similarly to Fang et al. (2020) we use Europe, European Union, and EEA interchangeably.

variable is for months on or after January 3, 2018 (i.e., post-MiFID II), and 0 otherwise (i.e., pre-MiFID II). Equation (3) presents the regression model.

$$ESG\ Incidents_{t+6} = \alpha + \beta\ TREAT\ x\ POST + FE + \varepsilon \quad (3)$$

where the dependent variable is *ESG Incidents* that is the overall level of media and stakeholder coverage of a company related to ESG issues. We are interested on the effect of *TREAT x POST* on *ESG Incidents*. β captures the incremental effect associated with implementing MiFID II in Europe, relative to the same period in other countries. The firm fixed effects subsume the effect for *TREAT*, while the month fixed effects subsume the main effect of *POST*.

We present the results in Panel A of Table 6. The coefficient on the main effect is negative and statistically significant in case of total ESG incidents (column 1). We can observe that the negative effect of MiFID is mainly driven by decrease of environmental (column 2) and governance (column 3) incidents. In general MIFID reduces ESG incidents by 1) 2.1% for the average frequency of ESG incidents in the data, 2) 3.1% for environmental incidents, 3) 1.85% for environmental incidents, and 4) not significant for social incidents.

Second, in order to mitigate the concern that the treated and control groups differ before to the implementation of MiFID, we implement a difference-in-differences research design with propensity-score matching (Rosenbaum and Rubin, 1983). We match the treated and control firms based on industry and month. We present the results in Table 6 Panel B. Similarly, we observe a negative effect of MiFID introduction on total ESG incidents, yet the main incidents that are significant are environmental incidents (column 1). Overall, MIFID reduces ESG incidents by: 1) 4.9% for the average frequency of ESG incidents in the data, 2) 8.2% for environmental incidents, 3) not significant for social incidents, and 4) not significant for governance incidents.

4.4 Mandatory ESG disclosure

The introduction of improved financial or non-financial disclosure standards reduces information asymmetry about firm fundamentals (Daske et al., 2008, Krueger et al., 2021). It then mitigates adverse selection problems and improve stock liquidity. Disclosure standards also improve the transparency of financial markets, firm fundamental value and thus reduce market manipulation. In order to test this conjecture we use mandatory introduction of ESG disclosure around the world. Krueger et al. (2021) compile a novel dataset of mandatory ESG disclosure and show that mandatory ESG disclosure standards decrease firm information asymmetry as they observe an increase in stock liquidity.

We therefore use Krueger et al. (2021) dataset on mandatory ESG disclosure that was compiled based on Carrots & Sticks (C&S) project, Global Reporting Initiative (GRI) and the Sustainable Stock Exchanges (SSE). ESG disclosure rules vary significantly across countries (Krueger et al., 2021).

We run a difference-in-difference research design using the sample of treated and control firms. *TREAT* equals 1 for companies headquartered that introduced mandatory ESG disclosure either by government or stock exchange (i.e., treatment sample) and 0 for companies headquartered elsewhere (i.e., control sample). *POST* equals 1 if the value of the dependent variable is years after mandatory ESG disclosure was introduced, and 0 otherwise. Equation (4) presents the regression model.

$$ESG\ Incidents_{t+12} = \alpha + \beta\ TREAT\ x\ POST + FE + \varepsilon \quad (4)$$

$TREAT\ x\ POST$ variable captures the introduction of mandatory ESG disclosure in country during and after year it was passed. Observations in our sample of treatment countries originate from

Canada, Australia, India, United Kingdom, France, China, South Africa, Spain, Germany, Belgium, Singapore, Italy, Netherlands, and Hong Kong. The set of control countries, most observations come from the United States, Japan, among others.

Before we analyse the results we make a number of checks. First, similarly to Krueger et al. (2021) we check if mandatory ESG regulations is in fact exogenous as the ESG regulations might have been introduced as a result of the rise in ESG incidents. We therefore test the effect of lagged by 12 months ESG incidents on the ESG regulations. As in Krueger et al. (2021), in tabulated results, we find no statistically significant effect. Second, as we use the ESG regulation for the instrument of market manipulation due to increased transparency, we check if ESG regulation did have an effect on market manipulation. We regress market manipulation measures on mandatory ESG regulation and find a negative and statistically significant coefficient (in untabulated table). It shows that introduction of mandatory ESG disclosure did have a negative and statistically significant effect on reduction of information asymmetry, improved transparency and reduced market manipulation.

We therefore, can interpret now the results from Eq. (4) that we present in Table 7. We show that the effect of $TREAT\ x\ POST$ is negative and statistically significant. It indicates that firms mandated to disclose ESG information have less ESG incidents. The results are economically significant as well. Overall, mandatory ESG disclosure reduces ESG incidents by: 1) 5.2% for the average frequency of ESG incidents in the data, 2) 1.8% for environmental incidents, 3) 2.0% for social incidents, and 4) 1.2% for governance incidents.

The results are in line with the literature showing that improved transparency has a positive externalities (Bonetti et al., 2022). Our results show the effect of improved transparency that reduces market manipulation has an effect on ESG incidents.

[Table 7]

5. Economic mechanisms

5.1 Financial frictions

Why the ESG incidents increase after stock market manipulation? The possible mechanism explaining this effect is through financial frictions that firms face after stock market manipulation. Firms facing stronger financial frictions does not have productive capacity to improve the ESG issues and thus fail to comply with ESG regulations. In order to proxy for financial frictions we use the *LOW_CF* that is the dummy variable equal to one if the firm experiences financial frictions proxied by cash flows lower than median value, and zero otherwise. Cash flow is the ratio of income plus depreciation to beginning-of-year to total assets. Cash flow is winsorized at the top and bottom 1% of its distribution (Cleary, 2006; Kaplan and Zingales, 1997; Agrawal and Matsa, 2013; Lyandres et al., 2019).

In order to understand this mechanism we estimate a two set of regression equations similar to Eq. (1). First, we replace ESG incidents with *LOW_CF* in Eq. (1) in order to check the effect of market manipulation on financial frictions and we expect a positive effect that firm financial frictions increase after market manipulation. Second, we replace market manipulation with *LOW_CF* in Eq. (1) in order to verify if financial frictions affect ESG incidents.

We present the results in Table 8. In Panel A we present the effect of market manipulation on financial frictions and in Panel B the effect of financial frictions on ESG issues. We use the yearly data for this analysis. As expected the coefficient in Panel A is positive and significant suggesting that market manipulation increases financial frictions. Subsequently, in Panel B, also as expected the financial frictions are positively related to ESG issues at 1% significance level.

In particular, a one standard deviation increase in financial frictions (*LOW_CF*) is associated with a 1) 59.2% increase in ESG incidents relative to the average frequency of ESG

incidents in the data, 2) 47.0% increase in environmental incidents, 3) 39.2% increase in social incidents, and 4) 93.2% increase in governance incidents. The effect is driven by all types of incidents: environmental, social and governance.

Overall, these results suggest that after market manipulation, it is more difficult for firms to raise funding, and therefore they fail to find resources to comply with ESG standards and experience more ESG issues.

[Table 8]

5.2 Business risk

Another possible mechanism explaining the effect of stock market manipulation on ESG incidents is through and increase in business risk that firms might experience after stock market manipulation. Following Dhaliwal et al. (2016) as a proxy for business risk we use customer concentration. Customer concentration is so critical that Statement of Financial Accounting Standards (SFAS) No. 131 (previously SFAS No. 14) mandates firms to disclose information about major customers. Therefore, firms having more major customers face greater business risk. Dhaliwal et al. (2016) show than an increase in business risk increases the cost of capital. In general, business risks and operating environment are important determinants of its cost of equity capital (Modigliani and Miller, 1958).

We stipulate that a business risk of a firm that experiences market manipulation increases and therefore it elevates as well its cost of capital. An increase in the cost of capital will decrease the level of any future investments in the improvements or maintenance of ESG standards. Therefore, the firm with greater business risk will be more prone to ESG incidents due to an increase in the cost of capital.

We present the results of testing this channel in Table 9. We do observe that market manipulation increases business risk, and subsequently the business risk increases ESG incidents. However, this channel only works through overall ESG incidents but seems to be driven by governance incidents. In particular, a one standard deviation increase in business risk is associated with a 1) 49.7% increase in ESG incidents relative to the average frequency of ESG incidents in the data and 2) 116.5% increase in governance incidents.

[Table 9]

5.3 Employment

Finally, the effect of stock market manipulation on ESG incidents is through a decrease in employment that firms might experience after stock market manipulation. Anecdotal evidence suggests that there are frequently staffing problems followings manipulation scandals.[9] Therefore, we would expect more ESG issues after employment decreases forced by market manipulation. We illustrate this in Table 10. The results show that market manipulation has a positive and significant effect on decrease in employment. Subsequently, drop in employment has a positive effect on the ESG incidents. However, this channel only works through governance incidents. In particular, a one standard deviation increase in employment is associated with a 31.1% increase in governance incidents. Suggesting that the channel is mostly related to governance misconduct.

[Table 10]

[9] Financial Times, May 25, 2022 https://www.ft.com/content/d3d8f7fd-4c73-417e-bd4c-41951a33792f

6. Heterogeneity

In this section, we test if the effects of market manipulation on ESG incidents differ across regions and industries. The purpose of this analysis is to examine what drives the sensitivity of ESG incidents to market manipulation. For example, the specific industries or regions might have greater sensitivity to environmental or social issues.

6.1 Variation by region

First, we analyse the differences for market manipulation and ESG incidents link across regions. We focus on several regions with the largest number of observations. We find that the relationship between market manipulation and ESG incidents is only significant for European Union (EU, including UK before 2018), US, and Canada, with Canada being the most sensitive region. We find that the relations is not significant for countries from the Asian region.

[Table 11]

6.2 Variation by industry

In this subsection we test whether the effects of market manipulation on ESG incidents vary across industries. We compare the sample bases on 12 Fama-French industries. In Table 12 we present the results where the regressions are estimated for various industries. In general, market manipulation and ESG incidents relationship is the most sensitive for telecommunication (column 7), wholesale and retail services (column 8), business equipment, computers and software (column 6), oil, gas and coal extraction (column 4).

[Table 12]

7. Conclusion

In this paper we analyse the effects of market manipulation on ESG incidents. Market manipulation gives rise to short-termism and has a negative effects on corporate decisions. We test the relationship between market manipulation and ESG incidents for an international sample of firms from 2007 to 2018. We find that there is a strong impact of market manipulation on ESG violations in general and also on subcategories of ESG so environmental, social and governance issues. In order to mitigate the endogeneity issues we use as a quasi-natural experiment the 2018 MiFID regulatory chance that curbed the market manipulation and we test its effect in a difference-in-difference design on ESG incidents. We find that there was less ESG incidents after MiFID exogenous shock that curbed market manipulation. We also show that the possible channel through which market manipulation affects ESG incidents is through: 1) financial frictions, 2) business risk, and 3) employment turnover. We also find that there is some heterogeneity in the effect of market manipulation on ESG issues among countries and industries. For example, the relationship is the most sensitive for countries such as Canada and EU and in certain industries such as telecommunication, wholesale and retail services.

While, we tried to mitigate the concerns about endogeneity in multiple ways (different lags of market manipulation, fixed effect structure, matched samples, DiD) and we provided some evidence about causal relationship, our results should be taken with caution due to the timing of the ESG incidents. In particular, RepRisk dataset provides the date when the ESG issue was recorded by the algorithm. Therefore, it is difficult to determine the time when the ESG incident occurred and when it was detected, we only have information about the time when it was recorded by the algorithm. We tried to mitigate this potential drawback by using different lags of market manipulation and subgroups of ESG incidents (as the timing for each one might be different). We did not find any important differences.

Overall, our findings present an important international evidence for regulators that ESG incidents and subsequent violations will follow market manipulation cases. Therefore, the regulators in directing their efforts in checking for compliance with regulatory frameworks might first turn to companies that experienced market manipulations. This evidence supplements previous research on corporate misconduct that that wage theft precedes financial misconduct.

Our analyses here are focused on stock market manipulation events and their relation to ESG violations. We do not consider other types of financial fraud, such as accounting fraud (Karpoff et al., 2008a,b; Karpoff, 2021). Future work could examine the relation between other types of fraud and ESG violations.

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TABLE 1 – 28 categories of ESG issues

Environmental	Social	Governance	Cross-cutting Issues
Animal mistreatment Climate change, GHG emissions, and global pollution Impacts on landscapes, ecosystems, and biodiversity Local pollution Overuse and wasting of resources Waste issues	Child labor Discrimination in employment Forced labor Freedom of association and collective bargaining Human rights abuses, corporate complicity Impacts on communities Local participation issues Occupational health and safety issues Poor employment conditions Social discrimination	Anti-competitive practices Corruption, bribery, extortion, money laundering Executive compensation issues Fraud Misleading communication Tax evasion Tax optimization	Controversial products and services Products (health and environmental issues) Supply chain issues Violation of international standards Violation of national legislation

TABLE 2 – Sample characteristics

This table reports the sample distribution by country in Panel A and summary statistics in Panel B of the main variables used in our analysis from 2008 to 2018 for 39 countries. All variables are defined in the Appendix.

Panel A: Sample distribution by country

Country	Obs.	Perc. (%)
US	362,341	27.6
CN	185,039	14.1
CA	108,108	8.24
JP	103,264	7.87
IN	92,664	7.06
GB	51,221	3.9
KY	47,916	3.65
AU	45,804	3.49
RU	43,824	3.34
TW	38,808	2.96
BM	24,024	1.83
BR	23,764	1.81
FR	22,308	1.7
DE	21,516	1.64
IL	16,500	1.26
SG	14,124	1.08
US	362,341	27.6
CN	185,039	14.1
CA	108,108	8.24
JP	103,264	7.87
IN	92,664	7.06
GB	51,221	3.9
KY	47,916	3.65
AU	45,804	3.49
RU	43,824	3.34
TW	38,808	2.96
BM	24,024	1.83
BR	23,764	1.81
FR	22,308	1.7
DE	21,516	1.64
IL	16,500	1.26
SG	14,124	1.08
Other	<13,000	<1

Panel B: Summary statistics

	Obs.	Mean	Std. dev.	25th	Median	75th
L6.Market manipulation_d	1,248,660	0.117	0.321	0	0	0
L12.Market manipulation_d	1,189,200	0.115	0.318	0	0	0
L6.Market manipulation	1,248,660	0.221	0.732	0	0	0
L12.Market manipulation	1,189,200	0.216	0. 723	0	0	0
>=1 Market manipulation in the past 6 months	1,248,660	1.332	2.802	0	0	1
>=1 Market manipulation in the past 12 months	1,248,660	2.631	5.183	0	0	3
RRI ESG	1,248,660	4.861	9.655	0	0	3
RRI Environmental	1,248,660	0.999	3.523	0	0	0
RRI Social	1,248,660	1.792	5.125	0	0	0
RRI Governance	1,248,660	1.666	5.315	0	0	0

TABLE 3 – Market manipulation and exposure to reputational risks related to ESG: Baseline regressions

This table reports the results of a regression of market manipulation measures on ESG incidents. In column (1) and (5) the dependent variable is the total of ESG related incidents (RRI ESG) and in columns (2) to (4) and (6) to (8) the incidents are grouped into environmental in column (2) and (6), social in column (3) and (7) and governance in column (4) and (8). In Panel A the main independent variable is *MarketManipulation_d* that is equal to one if there was market manipulation that happened t months before the ESG incident and zero otherwise. In Panel B the main independent variable is *MarketManipulation* that is the count of market manipulation that happened t months before the ESG incident. In Panel C the main independent variable is *market manipulation* that happened during t months before the ESG incident and zero otherwise. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: Dummy as market manipulation

Variable	*(1)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*	*(5)* *RRI ESG*	*(6)* *RRI Environmental*	*(7)* *RRI Social*	*(8)* *RRI Governance*
L6.MarketManipulation_d	0.1970***	0.0351***	0.0354***	0.0416***				
	[7.45]	[3.41]	[3.41]	[5.03]				
L12.MarketManipulation_d					0.1626***	0.0325***	0.0331***	0.0432***
					[5.96]	[3.11]	[3.11]	[5.35]
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,248,660	1,248,660	1,248,660	1,248,660	1,189,200	1,189,200	1,189,200	1,189,200
R^2	0.536	0.399	0.410	0.390	0.540	0.405	0.416	0.398

Panel B: Count of market manipulation

Variable	(1) RRI ESG	(2) RRI Environmental	(3) RRI Social	(4) RRI Governance	(5) RRI ESG	(6) RRI Environmental	(7) RRI Social	(8) RRI Governance
L6.MarketManipulation	0.0746***	0.0144***	0.0145***	0.0136***				
	[7.70]	[3.79]	[3.79]	[4.70]				
L12.MarketManipulation					0.0669***	0.0106***	0.0107***	0.0133***
					[6.80]	[2.80]	[2.80]	[4.61]
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry x Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,248,660	1,248,660	1,248,660	1,248,660	1,189,200	1,189,200	1,189,200	1,189,200
R^2	0.536	0.399	0.410	0.390	0.540	0.405	0.416	0.398

Panel C: ESG incidents in the past 6 and 12 months

Variable	*(1)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*	*(5)* *RRI ESG*	*(6)* *RRI Environmental*	*(7)* *RRI Social*	*(8)* *RRI Governance*
>=1 Market manipulation in the past 6 months	0.0746***	0.0132***	0.0132***	0.0142***				
	[8.96]	[4.06]	[4.06]	[5.52]				
>=1 Market manipulation in the past 12 months					0.0578***	0.0112***	0.0112***	0.0111***
					[8.94]	[4.39]	[4.39]	[5.45]
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,248,660	1,248,660	1,248,660	1,248,660	1,189,200	1,189,200	1,189,200	1,189,200
R^2	0.533	0.393	0.405	0.382	0.533	0.393	0.405	0.382

TABLE 4 – Market manipulation and exposure to reputational risks related to ESG: positive and negative signal

This table reports the results of a regression of market manipulation on ESG incidents. In column (1) and (5) the dependent variable is the total of ESG related incidents (RRI ESG) and in columns (2) to (4) and (6) to (8) the incidents are grouped into environmental in column (2) and (6), social in column (3) and (7) and governance in column (4) and (8). In Panel A (B) the main independent variable is *MarketManipulation_d <positive signal>* (*MarketManipulation_d <negative signal>*) that is equal to one if there was market manipulation upwards (downwards) that happened in t month before the ESG incident and zero otherwise. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: Positive signal

Variable	*(2)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*	*(5)* *RRI ESG*	*(6)* *RRI Environmental*	*(7)* *RRI Social*	*(8)* *RRI Governance*
L6.MarketManipulation_d <positive signal>	0.1961***	0.0329***	0.0331***	0.0306***				
	[6.71]	[2.86]	[2.86]	[3.40]				
L12.MarketManipulation_d <positive signal>					0.1639***	0.0314***	0.0319***	0.0322***
					[5.52]	[2.66]	[2.66]	[3.61]
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	1,248,660	1,248,660	1,248,660	1,248,660	1,189,200	1,189,200	1,189,200	1,189,200
N	0.536	0.399	0.410	0.390	0.540	0.405	0.416	0.398

Panel B: Negative signal

Variable	*(2)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*	*(5)* *RRI ESG*	*(6)* *RRI Environmental*	*(7)* *RRI Social*	*(8)* *RRI Governance*
L6.MarketManipulation_d <negative signal>	0.1261***	0.0283***	0.0286***	0.0325***				
	[4.76]	[2.73]	[2.73]	[3.89]				
L12.MarketManipulation_d <negative signal>					0.1047***	0.0260**	0.0264**	0.0328***
					[3.82]	[2.50]	[2.50]	[3.99]
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	1,248,660	1,248,660	1,248,660	1,248,660	1,189,200	1,189,200	1,189,200	1,189,200
N	0.536	0.399	0.410	0.390	0.540	0.405	0.416	0.398

TABLE 5 – Market manipulation and exposure to reputational risks related to ESG: additional controls

This table reports the results of a regression of market manipulation on ESG incidents. In column (1) the dependent variable is the total of ESG related incidents (RRI ESG) and in columns (2) to (4) the incidents are grouped into environmental in column (2), social in column (3) and governance in column (4). The main independent variable is *MarketManipulation_d* that is equal to one if there was market manipulation that happened in t month before the ESG incident and zero otherwise, in Panel A t= 6 months and in Panel B t=12 months. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: 6 months

Variable	*(1)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*
L6.MarketManipulation_d	0.1292***	0.0162*	0.0201*	0.0253***
	[4.46]	[1.72]	[1.72]	[3.54]
Size	0.0987***	0.1261***	0.1650***	-0.0344
	[6.61]	[4.28]	[7.00]	[-1.21]
Cash Flow	0.3424*	0.3445	-0.1036	1.2470**
	[1.65]	[1.04]	[-0.35]	[2.47]
ROA	-0.0061**	-0.0046	-0.0016	-0.0179***
	[-2.49]	[-1.17]	[-0.44]	[-3.19]
Solvency	-0.0012*	-0.0019	-0.0023**	0.0008
	[-1.77]	[-1.46]	[-2.00]	[0.63]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes
N	692,166	692,166	692,166	692,166
R^2	0.595	0.442	0.460	0.446

Panel B: 12 months

Variable	*(1)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*
L12.MarketManipulation_d	0.1176***	0.0218**	0.0271**	0.0310***
	[3.82]	[2.18]	[2.18]	[4.31]
Size	0.0939***	0.1150***	0.1627***	-0.0345
	[6.12]	[3.81]	[6.76]	[-1.20]
Employment	0.3570*	0.3624	-0.1265	1.3106***
	[1.68]	[1.07]	[-0.42]	[2.58]
Cash Flow	-0.0063**	-0.0045	-0.0013	-0.0188***
	[-2.53]	[-1.11]	[-0.35]	[-3.32]
ROA	-0.0011	-0.0020	-0.0022*	0.0009
	[-1.63]	[-1.49]	[-1.84]	[0.68]
Solvency	0.0939***	0.1150***	0.1627***	-0.0345
	[6.12]	[3.81]	[6.76]	[-1.20]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month x Industry x Country	Yes	Yes	Yes	Yes
N	666,156	666,156	666,156	666,156
R^2	0.595	0.442	0.460	0.446

TABLE 6 – Market manipulation and exposure to reputational risks related to ESG: MiFID analysis

The table presents results on cross-sectional variation in the impact of MiFID on ESG incidents (Panel A and B). In Panel A (B) we present the results for unmatched (PMS matched) sample. In column (1) the dependent variable is the total of ESG related incidents (RRI ESG) and the incidents are grouped into environmental in column (2), social in column (3) and governance in column (4). All variables are defined in the Appendix. In Panel A and B all models are difference-in-differences, using the full sample containing European as treated and other countries as control firm-year observations. The pre-treatment period is 12 months before and post-period is 12 months after. We estimate the following model:

$$ESG\ Incidents_t = \beta_0 + \beta_1 TREAT\ x\ POST + Firm\ FE + Month\ FE + \varepsilon$$

where the $POST$ is equal to one on or after Jan 2018, and zero otherwise, $TREAT$ is equal to one if firm is located in European Economic Area (EEA), which comprises the EU members (as of January 2018) plus Iceland, Liechtenstein, and Norway, and zero otherwise. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: MiFID II – full sample

Variable	*(1)* *RRI* *ESG*	*(2)* *RRI* *Environmental*	*(3)* *RRI* *Social*	*(4)* *RRI* *Governance*
Post x Treat	-0.6314***	-0.1588**	-0.0128	-0.2209**
	[-3.46]	[-2.38]	[-0.12]	[-1.96]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Industry x Country FE	Yes	Yes	Yes	Yes
N	238,656	238,656	238,656	238,656
R^2	0.819	0.875	0.866	0.868

Panel B: MiFID II – PSM matched sample (month, industry, and size)

Variable	*(1)* *RRI* *ESG*	*(2)* *RRI* *Environmental*	*(3)* *RRI* *Social*	*(4)* *RRI* *Governance*
Post x Treat	-0.8273***	-0.2322**	0.0612	-0.1523
	[-2.58]	[-2.22]	[0.33]	[-0.73]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Industry x Country FE	Yes	Yes	Yes	Yes
N	54,662	54,662	54,662	54,662
R^2	0.853	0.874	0.863	0.879

TABLE 7 – Market manipulation and exposure to reputational risks related to ESG: Mandatory ESG disclosure

The table presents results on cross-sectional variation in the impact of mandatory ESG disclosure on ESG incidents. In column (1) the dependent variable is the total of ESG related incidents (RRI ESG) and the incidents are grouped into environmental in column (2), social in column (3) and governance in column (4). All variables are defined in the Appendix. All models are difference-in-differences, using the full sample containing firms in countries that imposed mandatory ESG requirement as treated and firm located in other countries as control firm-year observations:

$$ESG\ Incidents_t = \beta_0 + \beta_1 TREAT\ x\ POST + Firm\ FE + Month\ FE + \varepsilon$$

where the $POST$ is equal to one in year equal to or greater that the year when ESG disclosure requirements were introduced, and zero otherwise, $TREAT$ is equal to one if firm is located in a country that introduced the mandatory ESG disclosure, and zero otherwise. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Variable	*(1)* *RRI ESG*	*(2)* *RRI Environmental*	*(3)* *RRI Social*	*(4)* *RRI Governance*
Post x Treat	-0.6094***	-0.2153***	-0.2334***	-0.1412*
	[-4.67]	[-4.06]	[-3.20]	[-1.73]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Industry x Country FE	Yes	Yes	Yes	Yes
N	1,193,280	1,193,280	1,193,280	1,193,280
R^2	0.457	0.578	0.542	0.539

TABLE 8 – Market manipulation and ESG incidents: Financial frictions mechanism

The table presents the mechanism behind the effect of market manipulation on ESG incidents. We estimate a two set of regression equations similar to Eq. (1). First in Panel A, we replace ESG incidents with *Low_CF* in Eq. (1) in order to check the effect of market manipulation on financial frictions. Second in Panel B, we replace market manipulation with *Low_CF* in Eq. (1) in order to verify if financial frictions affect ESG incidents. The sample is now based on yearly data and values for market manipulation and ESG incidents are aggregated at yearly level. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: The effect of market manipulation on financial frictions

Variable	*Low_CF*
>=1 Market manipulation in the past 12 months	0.0044***
	[7.92]
Constant	Yes
Firm FE	Yes
Month x Industry x Country FE	Yes
N	99,100
R^2	0.541

Panel B: The effect of financial frictions on ESG incidents

Variable	*(1)* *RRI* *ESG*	*(2)* *RRI* *Environmental*	*(3)* *RRI* *Social*	*(4)* *RRI* *Governance*
Low_CF	5.9403***	0.0796***	0.9717***	0.0661***
	[7.03]	[3.02]	[3.02]	[3.03]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Month x Industry x Country FE	Yes	Yes	Yes	Yes
N	99,100	99,100	99,100	99,100
R^2	0.541	0.541	0.541	0.541

TABLE 9 – Market manipulation and ESG incidents: Business risk mechanism

The table presents the mechanism behind the effect of market manipulation on ESG incidents. We estimate a two set of regression equations similar to Eq. (1). First in Panel A, we replace ESG incidents with *Business_Risk* in Eq. (1) in order to check the effect of market manipulation on financial frictions. Second in Panel B, we replace market manipulation with *Busiess_Risk* in Eq. (1) in order to verify if financial frictions affect ESG incidents. The sample is now based on yearly data and values for market manipulation and ESG incidents are aggregated at yearly level. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: The effect of market manipulation on business risk

Variable	*Business_Risk*
>=1 Market manipulation in the past 12 months	0.0031***
	[4.11]
Constant	Yes
Firm FE	Yes
Year x Industry x Country FE	Yes
N	15,870
R^2	0.688

Panel B: The effect of business risk on ESG incidents

Variable	*(1)* *RRI* *ESG*	*(2)* *RRI* *Environmental*	*(3)* *RRI* *Social*	*(4)* *RRI* *Governance*
Business_Risk	7.1561**	-0.3232	1.0013	4.8514***
	[2.35]	[-0.30]	[0.50]	[2.91]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year x Industry x Country FE	Yes	Yes	Yes	Yes
N	15,870	15,870	15,870	15,870
R^2	0.689	0.616	0.596	0.526

TABLE 10 – Market manipulation and ESG incidents: Employment mechanism

The table presents the mechanism behind the effect of market manipulation on ESG incidents. We estimate a two set of regression equations similar to Eq. (1). First in Panel A, we replace ESG incidents with *Emp_Decrease* in Eq. (1) in order to check the effect of market manipulation on financial frictions. Second in Panel B, we replace market manipulation with *Emp_Decrease* in Eq. (1) in order to verify if financial frictions affect ESG incidents. The sample is now based on yearly data and values for market manipulation and ESG incidents are aggregated at yearly level. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: The effect of market manipulation on decrease in employment

Variable	*Emp_Decrease*
>=1 Market manipulation in the past 12 months	0.0033***
	[5.17]
Constant	Yes
Firm FE	Yes
Year x Industry x Country FE	Yes
N	47,522
R^2	0.300

Panel B: The effect of decrease in employment on ESG incidents

Variable	*(1)* *RRI* *ESG*	*(2)* *RRI* *Environmental*	*(3)* *RRI* *Social*	*(4)* *RRI* *Governance*
Emp_Decrease	0.5586	0.3146	-0.6463	1.0657*
	[0.60]	[0.89]	[-1.22]	[1.67]
Constant	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year x Industry x Country FE	Yes	Yes	Yes	Yes
N	47,522	47,522	47,522	47,522
R^2	0.760	0.693	0.666	0.616

TABLE 11 – Market manipulation and exposure to reputational risks related to ESG: Variation across geographical regions

This table reports the results of a regression of market manipulation on ESG incidents. The dependent variable is the total of ESG related incidents (RRI ESG) The main independent variable is *MarketManipulation_d* is equal to one if there was market manipulation that happened in 12 month before the ESG incident and zero otherwise. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

	EU	*US*	*CN*	*JP*	*CA*	*IN*
	(1)	*(2)*	*(3)*	*(4)*	*(6)*	*(7)*
Variable	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*
L12.MarketManipulation_d	0.0547***	0.0348***	0.0272	-0.0039	0.0906**	0.0177
	[2.77]	[4.48]	[1.25]	[-0.31]	[2.43]	[0.94]
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Month x Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
N	136,560	329,,400	168,120	93,840	98,280	84,240
R^2	0.622	0.560	0.336	0.508	0.485	0.413

TABLE 12 – Market manipulation and exposure to reputational risks related to ESG: Variation across industry

This table reports the results of a regression of market manipulation on ESG incidents. The dependent variable is the total of ESG related incidents (RRI ESG) The main independent variable is *MarketManipulation_d* is equal to one if there was market manipulation that happened in 12 month before the ESG incident and zero otherwise. All variables are defined in the Appendix. The values reported in parentheses below coefficients represent t-statistics. Standard errors are clustered at firm level. *, **, *** represent significance at 1%, 5%, and 10% respectively.

Panel A: Sample split by industry

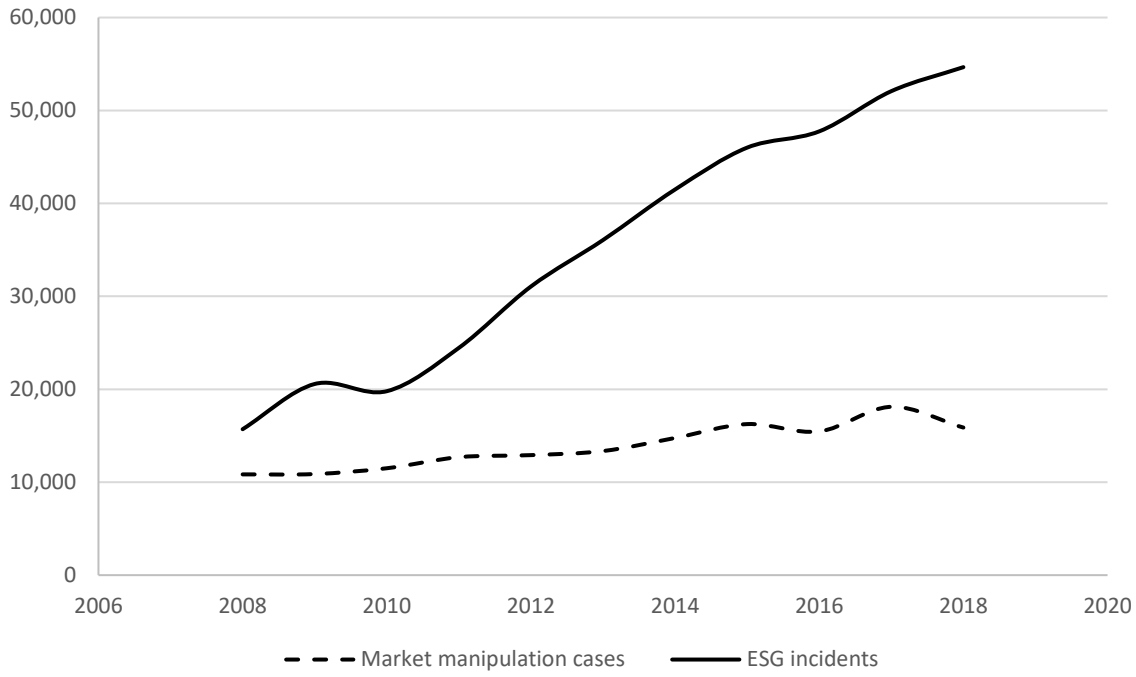
	Consumer Non Durables	*Consumer Durables*	*Manufacturing*	*Oil, Gas, and Coal Extraction*	*Chemicals*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
Variable	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*
L12.MarketManipulation_d	0.0339**	0.0083	0.0290**	0.0112	0.0134
	[2.24]	[0.42]	[2.21]	[0.73]	[0.59]
Constant	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Month x Country FE	Yes	Yes	Yes	Yes	Yes
N	124,920	41,760	175,440	85,200	55,581
R^2	0.537	0.654	0.498	0.662	0.531

Panel B: Sample split by industry – continued

	Business Equipment, Computers, Software	*Telephone and Television Transmission*	*Wholesale, Retail, and Some Services*	*Healthcare, Medical Equipment, and Drug*	*Other*
	(6)	*(7)*	*(8)*	*(9)*	*(10)*
Variable	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*	*RRI ESG*
L12.MarketManipulation	0.0524***	0.0683*	0.0479***	0.0265	0.0300**
	[2.98]	[1.86]	[3.07]	[1.13]	[2.45]
Constant	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes
Month x Country	Yes	Yes	Yes	Yes	Yes
N	146,400	33,720	136,440	85,920	294,000
R^2	0.522	0.571	0.550	0.518	0.483

FIGURE 1 – ESG incidents and market manipulation

This figure reports the number of ESG incidents and market manipulation cases.



APPENDIX 1 – Variable description

Variable name	Definition [source of data]
RRI ESG	RRI Total ranges from zero (lowest) to 100 (highest). The higher the value, the higher the risk exposure. It denotes the current level of media and stakeholder coverage of a company related to ESG issues. The measure is based on a proprietary algorithm developed by RepRisk that dynamically captures exposure to reputational risks related to ESG. It facilitates an initial assessment of the ESG and business conduct risks associated with financing, investing, or doing business with a particular company. [RepRisk]
RRI Environmental	The level of media and stakeholder coverage of a company related incidents to (E) risk incidents. [RepRisk]
RRI Social	The level of media and stakeholder coverage of a company related incidents to (S) risk incidents. [RepRisk]
RRI Governance	The level of media and stakeholder coverage of a company related incidents to (G) risk incidents. [RepRisk]
MarketManipulation	The count of market manipulations (price and/or volume) that happened at time t. [CMCRC]
MarketManipulation_d	A dummy variable equal to one if there was market manipulation (price or volume) at time t, and zero otherwise. [CMCRC]
Size	The natural logarithm of the firm's market value. [ORBIS]
Cash flow	The level of cash. [ORBIS]
ROA	The return on assets. [ORBIS]
Solvency	The shareholders' funds to total assets. [ORBIS]
LOW_CF	A dummy variable equal to one if the firm experiences financial frictions proxied by cash flows lower than median value, and zero otherwise. Cash flow is the ratio of income plus depreciation to beginning-of-year to total assets. [ORBIS]

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