Trends, Determinants, and Effects of ESG-linked Pay around the World*

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Abstract

We conduct a large-scale global study of ESG-linked pay for 2,772 firms across 48 countries. We find that the adoption of ESG-linked pay is higher for firms in extractive and utility industries, for firms located in French civil law countries or in countries with stronger shareholder protections, lower corruption, higher individualism, and low masculinity, as well as for large firms or value firms. The adoption of ESG-linked pay is positively associated with a firm's financial outcomes as well as its ESG scores. We identify for a plausibly causal effect by exploiting an exogenous shock on corporate mandatory ESG disclosure requirement. These results provide insights into the determinants of ESG-linked pay practice and its implications for firms' financial and ESG performance.

JEL Classification: G11, G12, G23

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1. Introduction

While firms have traditionally used financial metrics such as net earnings or return on investment to reward executives, the use of non-financial measures (such as product quality, customer satisfaction, and employee satisfaction) has been on the rise.[1] Explicit ESG-linked executive remuneration contracts are a way of incorporating ESG goals such as CO_2 emission targets or employee satisfaction in managerial incentives. In 2018, 13.18% of firms in the MSCI's All Country World Index (ACWI) firms had ESG-linked pay compared to 1.78 % in 2009. Anecdotally, firms such as Intel and Alcoa are well-documented examples of ESG-linked pay in practice. More recently, BHP, the world's largest mining company, released a statement stating "increased weighting, specificity and transparency on climate change" in metrics to evaluate performance bonus for their CEO.[2]

Despite the recent attempts by firms to incorporate ESG into executive compensation agreements, our understanding of the determinants and impact of this practice remains limited. The shareholder, stakeholder and institutional views of governance suggest that ESG-linked pay should result in better corporate social and/or financial performance. Critics, however, argue that ESG-linked compensation contracts may be symbolic and/or a reflection of agency problems if the related performance measures are susceptible to manipulation and hard to verify, and when board monitoring is weak.[3] Therefore, the factors associated with ESG-linked pay and its impact on firm outcomes remain an open question.

Most existing studies that analyse ESG-linked pay focus on less than a few hundred firms from one or two countries and for the pre-2015 period.[4] More recently there has been a substantial increase

[1] See recent articles: https://www.forbes.com/sites/shivaramrajgopal/2021/04/29/are-companies-tying-ceo-pay-to-esg-because-its-not-linked-to-performance/?sh=6cdda58976cd, https://www.wsj.com/articles/ceos-pledged-to-increase-diversity-now-boards-are-holding-them-to-it-11622626380

[2] The Intel and Alcoa examples are available at https://www.greenbiz.com/blog/2012/06/25/momentum-builds-link-ceo-salaries-sustainable-measures. The BHP examples are mentioned in https://www.ft.com/content/b6d26e9a-d93a-11e9-8f9b-77216ebe1f17. Additional examples are provided in Exhibit 1.

[3] Kolk and Perego (2014). Also see https://www.forbes.com/sites/shivaramrajgopal/2021/04/29/are-companies-tying-ceo-pay-to-esg-because-its-not-linked-to-performance/?sh=6cdda58976cd. Ittner *et al.* (1997) suggest that a way managers can increase their compensation (at the expense of shareholders/stakeholders) is by tying it to the achievement of non-financial performance measures, including sustainability metrics, that are potentially easy to manipulate and hard to verify.

[4] The latest papers (e.g., Flammer *et al*. (2019), and Ikram, Li and Minor (2019) use a sample of S&P 500 firms that ends in 2013, and Al-Shaer and Zaman (2019)) use a sample of UK FTSE350 firms for the period 2011-2015. Moreover, the documented association between ESG-linked pay and certain determinants or outcome variables may be driven by selection and thus subject to the usual "correlation versus causation" debate (Hong, 2019). Such identification issues are alleviated in Flammer and Bansal (2017) and Flammer *et al*. (2019), who compare

in ESG-linked pay practices, as well as increased shareholder attention and regulatory pressure calling for corporate long-run sustainability. Further, as shown by Liang and Renneboog (2017), country characteristics have a significant impact on a firm's CSR rating. Hence an important question is what country-specific institutional or cultural characteristics are likely to influence the adoption of ESG-linked pay and the effects of such contracts. Other cross-country studies on ESG-linked pay contracts that are narrower in scope include Mass and Rosendal (2015), who use a sample of 490 companies from 11 countries for one year only, 2010; and Tsang *et al.* (2021), who analyze the impact of ESG-linked pay on firm innovation for the years 2004-2015.

This paper conducts a comprehensive study of the factors related to the adoption of executive compensation contracts explicitly linked to ESG goals and their outcomes across 48 countries over 2009-2018. We believe this study is the first of its kind in analysing the factors correlated with and outcomes of ESG-linked executive compensation contracts in an inclusive, cross-county setting. The substantial cross-country variations in institutional and cultural environment and the cross-industry differences help us to better identity the factors related to firms' adoption of ESG-linked pay for their top executives and its impact on firm outcomes.[LP1][SH2]

The first contribution of our paper is to document the increase in the use of ESG-linked executive compensation contracts over time, which exhibits substantial cross-country and cross-industry variation. Exploring industry characteristics, we find significantly greater adoption of ESG-linked pay contracts in extractive industries such as mining and oil extraction, and in utilities and chemical industries, after controlling for year and country fixed effects. The findings indicate that worldwide, across 48 countries, ESG-linked pay contracts are indeed more prevalent in industries in which a firm's ESG impact and concerns are more material. The industry impact is not specific to only certain countries.

We next analyze the influence of country-specific institutional and cultural factors on the adoption of ESG-linked pay. In particular, we investigate the extent to which the implicit and explicit contracting environment (such as country-level rules and regulations, institutional arrangements, and societal

shareholder proposals (advocating the use of long-term executive compensation) that narrowly pass or fail, and by using the enactment of constituency statutes as an instrument for CSR contracting, respectively.

cultural preferences) impact a firm's choice to pursue ESG goals and to use a pecuniary, extrinsic compensation contract to incentivize top managers to meet these goals.

We find that a country's institutional framework – in particular, its legal origin and shareholder protections – is an important predictor of the adoption of ESG-linked pay, suggesting that a country's institutional framework plays a crucial role in shaping the contracting environment which drives firms' compensation decisions. Specifically, firms from countries with a French civil law legal origin and with stronger shareholder protections have a higher probability of adopting ESG-linked pay. One explanation for this is that firms from French civil law countries consider ESG goals to be as important as financial goals and hence directly contract on them. Liang and Renneboog (2017) argue that civil legal origin is associated with state intervention in economic life through rules and regulations and the stakeholder view of corporate purpose, and that therefore firms in these countries engage in CSR to a greater extent than firms in common-law countries. With respect to shareholder protections, our results suggest that countries with stronger legal protections for shareholders provide a contracting environment where boards are less concerned about the danger that top executives may abuse ESG benchmarking to increase their compensation.

Regarding the cultural dimension, we find that individualism is positively associated with the prevalence of ESG-linked pay, while masculinity and uncertainty avoidance are negatively associated with the probability of compensation contracts linked to ESG goals. Individualistic countries stress independence and personal achievement and adopt compensation contracts explicitly linked to ESG objectives to incentivize top executives to meet the firm's ESG goals. On the other hand, countries with a masculine culture stress competitiveness, achievements and material success: performance-contingent rewards, merit pay, and management by objectives are practices consistent with masculine culture. Therefore, such countries may tend to use more traditional long-term focused financial metrics without an explicit ESG pay link to reward executives.[5]

In addition, we find that the ESG-linked pay adoption is negatively associated with a country's uncertainty avoidance, a cultural dimension that expresses the degree to which the members of a society

[5] Liang and Renneboog (2017) find that masculinity is weakly positively related to ESG ratings, suggesting that masculine countries meet ESG goals without use of ESG-linked pay.

feel uncomfortable with uncertainty and ambiguity. One possible explanation is that countries with high uncertainty avoidance are likely to favor compensation practices which are linked to traditional financial metrics, which are more clear-cut and less prone to manipulation, rather than ESG-linked compensation contracts where the goals could be more ambiguous.

We next investigate the extent to which firm characteristics contribute to the adoption of ESG-linked pay contracts. A plausible null hypothesis is that large firms with a diversified shareholder base and global institutional investors are primarily interested in financial returns and adopt compensation contracts linked to financial metrics. On the other hand, the increased awareness of ESG issues may significantly increase the probability of larger firms adopting ESG-linked pay. Another, somewhat less plausible but nevertheless important consideration is that globalization may reduce the importance of country and social norms in setting pay contracts, especially for large global firms, so that firm-level features are more salient in driving the nature of executive compensation contracts. After accounting for country and industry characteristics, we find that observable firm characteristics explain only a very small fraction (about 2%) of the variance in ESG-linked pay[RAA3]. Year, country and industry characteristics have greater explanatory power (about 20%). In terms of firm characteristics, we find that larger firms and value firms have a higher propensity to adopt ESG-linked compensation contracts.

In our final set of results, we find that compensation contracts linked to ESG goals are positively associated with firm-level operating profit margin (OPM), ESG ratings and Tobin's Q. To sharpen identification and address potential endogeneity concerns, we exploit a quasi-exogenous event, Directive 2014/95/EU[6] of the European Parliament. The Directive promotes transparency by mandating large companies to make a non-financial disclosure that reports details of the firm's corporate governance policies including "non-financial key performance indicators relevant to the particular business". We identify a set of US firms with EU subsidiaries that are subject to the Directive and that first adopted ESG-linked pay after the Directive took effect as treatment firms, and match them to control firms with no policy exposure to the Directive and that never adopted ESG-linked pay. Using a Difference-in-Differences (DiD) methodology, we find that, after controlling for firm characteristics

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095

as well as industry, year, and event-year fixed effects, treatment firms experience (i) a larger increase in OPM after the adoption of ESG pay (following the 2014 enactment of the Directive) compared to control firms of about 4.18 %, representing approximately 32 % of the sample average OPM; (ii) a larger increase in SOSCORE (that is, Social Score covered by Asset4 ESG ratings) after the adoption of ESG pay compared to control firms of about 4.94 %, representing approximately 10% of the sample average SOSCORE. The DiD analysis of the relationship between the use of ESG-linked pay and Tobin's Q (which serves as a noisy measure of firm valuation) yields insignificant results. Recognizing the potential drawbacks of using the DiD specification to study the effect on Tobin's Q, given the small treatment sample and short event window, we supplement our DiD analysis with an alternative approach by running panel regressions of Tobin's Q on ESG pay adoption for a larger sample that includes both the treated US firms and all the non-treated US firms (that were not exposed to the policy change) that never adopted ESG-linked pay between 2011 and 2018. Using this alternative approach, we find that Tobin's Q is significantly higher when firms adopt ESG-linked pay implying a positive valuation effect of ESG pay adoption.

The paper is organized as follows. Section 2 discusses the data and their sources, and provides summary statistics. Section 3 presents the trends in ESG-linked pay, over a period of ten years from 2009-2018, across countries and industries. Section 4 analyzes the factors associated with ESG-linked pay and assesses the absolute and relative importance of country, industry and firm characteristics as determinants of ESG-linked pay. Section 5 examines the effects of ESG-linked pay on firms' financial and ESG performance. Section 6 concludes.

2. Sample and summary statistics

In this section, we describe our data sources and discuss descriptive statistics for the sample of firms used in our analysis. Our primary sample includes 2,772 firms, across 48 countries, in the MSCI All Country World Index (ACWI, as of December 2019) for the period of 2009-2018. ACWI includes a comprehensive and representative set of large- and mid-cap stocks from the major equity indices around the world, including both the MSCI World Index (developed countries) and the MSCI Emerging Markets Index; Chinese A stocks were not included until May 2018. As of June 2021[RAA4], the ACWI

covered more than 2,900 constituents across 11 sectors and approximately 85% of the free float-adjusted market capitalization in each market.: the full MSCI World Index, the top 25 companies of the MSCI Emerging Markets Index, the top 275 companies by market capitalization of the FTSE 100 and the FTSE 250 (excluding investment trusts), the ASX 200, etc[RAA5]. [LP6]

For firms in the ACWI Index, we obtain an ESG-linked pay indicator, *ESGPAY*, from Bloomberg for the years 2009-2018. *ESGPAY* is a dummy variable that equals one if executive compensation is linked to ESG goals and, zero otherwise. For example, for US firms Bloomberg collects information on executive compensation from annual proxy statements filed with the SEC; these contain descriptions of the structure of managerial compensation contracts for the top executives of the firm, including the performance metrics used for performance-based compensation. Bloomberg then manually reviews the description of each executive's compensation to identify performance metrics that are linked to ESG goals and assign the ESG-linked pay indicator value of one if incentives are provided that are linked to ESG, and zero otherwise. See Exhibit 1 for examples.[7]

Further data come from multiple sources. The data on cross-country cultural values - power distance, individualism, masculinity, and uncertainty avoidance - are collected from Geert Hofstede's website.[8] Data on legal origin and shareholder protection rights across countries are obtained from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) and Spamann (2010). Following Liang and Renneboog (2017) we include *Corruption control* and *Regulatory quality* from World Bank Governance indicators. *Corruption control* measures the extent to which politicians are constrained from pursuing their self-interest (through corruption), and *Regulatory quality* proxies for the government's effectiveness in addressing social responsibility and market externalities when implementing policies and regulations that promote private sector development.

[7] We also obtain ESG-linked pay variables from two additional sources: Refinitiv's Asset4 (2002-2018) and MSCI (2017-2018). We find that our results are robust with ESGPAY measures from these alternative sources.

[8] http://geert-hofstede.com/

We use the MSCI Barra country classifications to categorize countries into developed and emerging markets.[9] In addition, we obtain firm characteristics from Worldscope and Datastream, and institutional ownership data from Capital IQ. Industry fixed effects are based on the Fama-French 17-industry classification. For a full set of variables and their description see the Appendix.

3. Global CSR contracting trends

We find that there is significant variation in the adoption of ESG-linked pay by companies across time, countries and industries. Globally, in 2018, an average of 13 percent of ACWI firms had executive contracts explicitly linked to ESG goals: an increase from 2 percent in 2009 to 19 percent in 2018 for developed countries, and zero to 4 percent for emerging markets. To account for the possibility that the increase over time in the prevalence of ESG-linked pay contracts may be driven by increasing coverage of firms by Bloomberg, in Figure 1 we limit the depiction of the time trend of ESG-linked pay to the cohort of 1,729 ACWI firms that were continuously covered by Bloomberg over the period 2009-2018. Figure 1 shows that 16 percent had executive contracts explicitly linked to ESG goals in 2018. For firms in developed countries, executive contracts linked to ESG increased from 2 percent in 2009 to 25 percent in 2018, while for emerging markets, the rate of adoption was more modest, growing from 0 percent to 5 percent.

Next, we examine cross-industry variations. Figure 2, Panel A displays the mean rate of adoption of ESG-linked pay across the Fama-French 17-industry classification. Examining the evolution over time, we find that across all industries except consumer durables, the adoption of ESG-linked pay increased from 2009 to 2018. Furthermore, the increase in the use of ESG-linked pay was particularly strong in two industries: mining, where the proportion of firms with ESG-linked pay grew from 9 percent in 2009 to 51 percent in 2018, and oil and petroleum, where there was an over sevenfold increase from 6 percent in 2009 to 45 percent in 2019.

Focusing on the cohort of 1,729 firms that were continuously covered by Bloomberg over the period 2009-2018, Figure 2, Panel B shows the average level of ESG-linked executive compensation contracts for each of the 17 Fama-French industries for the years 2009, 2013 and 2018. Almost without

[9] https://www.msci.com/market-classification

exception, ESG-linked pay increases over time. Emission-intensive industries such as mining, oil and petroleum, utilities and chemicals industries have a greater proportion of firms with ESG-linked pay compared to other industries.

Figure 3 shows the country-level adoption of ESG-linked pay across geographical regions in 2018. The stark contrast between Asian countries and the rest of the world suggests that the adoption of ESG-linked executive contracts is related to variables driven by institutional, cultural and economical and differences across these regions. In the next section, we conduct a formal analysis to examine the determinants of ESG-linked pay, starting with industry fixed effects; then, country level variables; and lastly, firm characteristics.

4. The adoption of ESG-linked pay

In this section, we analyze the extent to which a firm's use of ESG-linked pay is associated with the industry to which the firm belongs, the institutional and cultural factors of the country where the firm's headquarters are located, and the individual characteristics of the firm.

4.1. Industry characteristics

We first test whether the adoption of ESG-linked pay is associated with certain industries. The previous section showed significant cross-industry and cross-country variation in the adoption of ESG-linked pay; hence a thorough analysis of ESG-pay adoption at the industry level must control for dynamics at the country level. We classify firms into the 17 Fama-French industries and report firm-level *ESGPAY* regression results in Table 2, Panel A. The analysis consists of annual panel regressions of firms' adoption of ESG-linked pay on industry indicators. To allow for systematic differences across countries and over time, we include year and country fixed effects. Thus our identification comes from within-country, within-year variation. In addition, to account for the possibility that ESG-linked pay may be correlated over time within a given country and across firms for a given year, we compute two-way clustered standard errors by country and by year.

Table 2, Panel A presents the results for the industries where the probability of the adoption of ESG-linked pay contracts is significant. Column (1) shows that within a country in a given year, the

probability that a firm adopts ESG-linked pay is highest in the following five industries: mining (29.8%), oil and petroleum (26.7%), utilities (22.1%) chemical (14.8%) and steel (10.3%).[10] Table 2, Panel B uses an alternative classification of industries, focusing on whether a firm is in an extractive industry or qualifies as a 'sin' stock. Given the focus on environmental concerns in extractive industries, we follow Dyck *et al.* (2019[RAA7]) and define a firm as belonging to an extractive industry if the firm is in the SIC Division B and oil and petroleum products of Fama-French 17 industries. We find that after controlling for country and year fixed effects, firms in extractive industries have greater adoption of ESG-linked pay contracts. One explanation for these results is that the firms in extractive industries and utilities tend to be most affected by negative ESG events.[11]

We also consider the role of social norms in determining whether firms adopt ESG-linked pay. Hong and Kacperczyk (2009) find that norm-constrained funds like pension funds shun 'sin' stocks, *i.e.* stocks of firms that belong to the gambling, tobacco and alcohol sectors. Hong and Kostovetsky (2012) find that mutual fund managers who make campaign donations to Democrats are less likely to hold socially irresponsible industries in their portfolios compared to non-donors and Republican donors. [LP8] We follow Hong and Kacperczyk (2009) and define an indicator variable, Sin Stocks, equal to one if the firm is in group 4, Beer or Alcohol, or group 5, Smoke or Tobacco, of [LP9]the Fama-French 48 industries. Column (1) of Table 2, Panel B shows that the probability of ESG-linked pay is substantially higher (23.5%) if the firm is in an extractive industry. On the other hand, we do not find evidence of a relation between sin stocks and ESG-linked pay.

4.2. Country characteristics

We next turn to regression analysis to formally test the relation between ESG-linked pay and country-specific characteristics for the period 2009-2018. Table 3 presents the results using different estimation

[10] Ikram *et al.* (2019) and Flammer *et al.* (2019) find similar results for U.S. firms. Ittner *et al.* (1997) find that the weight on non-financial metrics depends on the regulatory environment that firms are in, their strategic focus and the informativeness of the financial metrics. Specifically, the weight is higher for firms that follow innovation- and quality-orientated strategies and for utilities and telecommunications firms that face regulatory and competitive pressures to improve safety and customer satisfaction.

[11] For instance, BP incurred $18.7 billion in fines due to the Deepwater Horizon oil spill. https://www.reuters.com/article/us-bp-gulfmexico-settlement/bp-reaches-18-7-billion-settlement-over-deadly-2010-spill-idUSKCN0PC1BW20150702

methods. Columns 1-3 report OLS results, column 4 present the results from a probit model and column 5 presents the logistic regression. The dependent variable is *ESGPAY*.

Regarding cultural factors, we find that firms in individualistic countries are more likely to adopt ESG-linked compensation contracts. In terms of economic significance, column (5) reports that the odds of firms adopting ESG-linked pay increase by 7 percent in individualistic countries compared to collective countries. Individualism stresses independence and personal achievement, and firms headquartered in individualistic countries (countries with the highest individualism scores are the United States, Australia and United Kingdom) utilize ESG-linked pay contracts to incentivize top executives to meet the firm's ESG goals.

We find that masculinity is negatively related to the adoption of ESG-linked compensation contracts. In terms of economic significance, column (5) shows that the odds of adopting ESG-linked pay decrease by 2.2% for a firm located in a masculine country compared to a firm in a feminine country. A high score for masculinity means that the dominant values in the society consist of competition, achievement, and material rewards for success. Its opposite, femininity, stands for societies with a preference for cooperation, modesty, caring for the weak and quality of life. This implies that in feminine societies such as Norway, Sweden and Netherlands, people care more about ESG goals and firms utilize ESG-linked compensation contracts to meet them.

In columns (4) and (5) we also find that a third cultural dimension - uncertainty avoidance - is negatively related to the adoption of ESG-linked pay contracts. The coefficients in column (5) report that the odds of adopting ESG-linked compensation contracts decrease by 2.6% for high uncertainty avoidance countries. The uncertainty avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. Countries exhibiting strong uncertainty avoidance maintain rigid codes of belief and behavior, and are less open to new ideas and influences. Thus such countries may be less open to non-traditional compensation metrics for compensation such as ESG scores[RAA10].

In all regressions, the coefficient of the Anti-Director Rights Index (ADRI) is significantly positive, highlighting that countries with stronger legal protections for shareholders are more likely to adopt ESG-linked execution compensation contracts. The coefficient reported in column (5) indicate a

51% increase in the odds of ESG-linked pay for a one-unit increase in ADRI (ADRI ranges from 1 to 6). Stronger legal protection of outside investors limits the scope for expropriating them, and hence shareholders are willing to give top executives ESG-linked compensation contracts as they are not worried about these being misused.

Columns (4) and (5) show that firms in French civil law countries are more likely to adopt ESG-linked compensation contracts compared to firms in common law countries. Liang and Renneboog (2017) find that firms in civil law countries have higher ESG scores than firms in common law countries. Thus, this could be the ESG-linked pay maybe the mechanism which lead to higher ESG scores. [LP11]

4.3. Firm characteristics

We next turn to firm characteristics and their association with *ESGPAY*. The firm characteristics include firm size (log of total assets), book-to-market, ROA, leverage, earnings volatility, IVOL (idiosyncratic return volatility [RAA12]), firm age and institutional ownership (Ikram *et al.* (2019), Flammer *et al.* (2019)).

As shown earlier, industry and country factors play important roles in the adoption of ESG-linked pay. Unreported OLS regressions with year and country fixed effects alone have an explanatory power of 12.4%, and adding industry dummies further increases the R^2 of the regression to 19.7%. To better understand the impact of firm-specific variables, we control for year, country and Fama-French 17 industry fixed effects in all regressions. Standard errors are clustered at the year and country level.

Table 4 examine the regression of ESPAY on lagged firm characteristics. Adding firm characteristics increases the R^2 by about an additional 2.3% in column (3). This implies that firm-level variation in ESG-linked pay is largely subsumed by country-level and industry-level variation, indicating that firm characteristics play only a modest role in explaining firm-level ESG-linked pay. In probit and logit regressions, we find that large firms and value firms are more likely to adopt ESG-linked pay. Our results are consistent with Ikram *et al.* (2019), who also find that firm size is the most significant firm characteristic driving the adoption of ESG-linked pay. [LP13]

5. Effects of ESG-linked pay

In this section we now turn to outcomes and analyze the impact of ESG-linked pay on three firm-level outcomes: OPM, ESG ratings and Tobin's Q. For each outcome variable, we first start with the OLS regression, then we provide further analysis that helps with identification.

5.1. Identification strategy: plausibly exogeneous variation in ESG-linked pay

An obvious endogeneity concern about the association between ESG-linked pay and firm outcomes is that it could be driven by omitted variables that correlate with both the adoption of ESG-linked pay and unobservable firm characteristics. To address this concern and establish a causal effect of *ESGPAY* on firm outcomes, we exploit a quasi-natural experiment that introduces positive shocks to the likelihood of ESG-linked pay adoption using a difference-in-differences (DiD) methodology.

Specifically, we consider the Directive 2014/95/EU[12] of the European Parliament mandating increased disclosure of non-financial information as a plausible exogenous shock to the *ESGPAY*. The law, first proposed in April 2013, was adopted in April 2014. The Directive, promoting transparency, mandates affected companies to report a non-financial statement that provides details on the firm's corporate governance policies including "non-financial key performance indicators relevant to the particular business" including information on policies, risks, and outcomes regarding environmental matters, social and employee aspects. The rule applies to firms (i) listed on EU exchanges or with significant operations in the EU, (ii) defined as "large" (i.e., with 500 or more employees), or (iii) designated as public-interest entities by EU member states due to their activities, size, or number of employees.

We conjecture that this directive introduces a positive shock to firms' incentive to adopt ESG pay for two reasons: First, Directive 2014/95/EU exposes the affected firms to increased pressure (potentially from both the regulator and investors) to deliver/report good ESG performance, which leads to an increased need to incentivize managers to focus more on ESG and hence a higher likelihood of adopting ESG metrics in executive compensation. Second, this directive makes the disclosure of ESG related information more transparent and hence makes it easier for shareholders to monitor the firms'

[12] Original document of Directive 2014/95/EU of the European Parliament and of the Council can be viewed at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014L0095

ESG performance, making the ESG-linked targets more credible and suitable as performance metrics for managerial compensation contracts. Transparency (and standardization) of ESG performance disclosure is important to provide meaningful incentives for executives. Bebchuk and Tallarita (2022) argue that companies limited disclosure of specific ESG targets and actual outcome of ESG performance makes it difficult for outsiders to review and monitor, and hence may result in ESG-linked pay serving the interests of executives, rather than providing effective incentives.[AK14]

Due to increased pressure to report non-financial metrics, it is plausible that firms that have hitherto not paid attention to non-financial metrics and, do not have ESG-linked compensation contracts, will now incentivize managers by adopting *ESGPAY*. We thus consider firms that were plausibly affected by the Directive and adopted *ESGPAY* post its enactment, as treatment firms. We use the nearest neighbor method using Mahalanobis distance to find suitable control firms from a sample of firms that are not affected by the enactment of the Directive. While the adoption of ESG-linked pay is driven by self-selection, we argue that adopting *ESGPAY* makes compliance with the new Directive easier and hence, may plausibly be an exogenous shock for affected firms to adopt *ESGPAY*. Due to the increased non-financial disclosure post the Directive, firms that are more significantly affected by it may choose to incentivize senior management by adopting *ESGPAY*.

Not meeting shareholders' required level of performance on the non-financial metrics may have effects similar to firms not meeting financial targets like Earnings per Share, based on the relative weight shareholders apply to financial performance and non-financial performance. Hence, an argument can be made that increased pressure to disclose greater non-financial information may be plausibly linked to increased adoption of *ESGPAY*. Hence, we argue that firms that adopt *ESGPAY* after the enactment of the Directive are likely adopting it due to its enactment. Putting it another way, the decision to adopt ESGPAY by affected firms is more likely to be exogenous after the policy shock compared to the pre-directive period, as the decision to adopt ESGPAY after 2014 is more likely to be in response to the exogenous policy shock. This makes the regulation change a plausible event to analyze for establishing a causal effect of *ESGPAY* adoption on firm value.

The Directive is expected to directly affect European Union (EU) firms and firms that have subsidiaries in EU hiring 500 or more employees. One way to construct the sample for the DiD test is

to identify treatment firms from affected EU-domiciled firms and match them with firms domiciled in non-EU countries with similar firm-level and country-level characteristics. However, finding a suitable control firm for the EU-domiciled treatment firm poses a challenge as this method runs the risk of picking up an EU effect since our country-level regression results show that cultural variables play a significant role in *ESGPAY* adoption. To mitigate this risk, we instead focus on US firms that have EU subsidiaries[13] and are covered by Bloomberg. Specifically, we focus on Russell 3000 US firms with EU subsidiaries that adopted *ESGPAY* after the Directive was enacted. The control firms are US firms without EU subsidiaries and hence were not impacted by the Directive, and never adopted *ESGPAY*.

In our final sample, we identify 64 treatment firms from the pool of US firms with EU subsidiaries that first adopted ESG-linked pay after year 2014. We impose the requirement that all the firms should have continuous ESG pay data coverage starting from three years before the adoption of the directive up to four years post the directive adoption (i.e., 2011-2018). Each treatment firm is matched to one control firm operating in the same Fama-French 17 industry with the smallest Mahalanobis distance (matched on the pre-event values of firm size, book-to-market, and Tobin's Q) from the pool of U.S. firms with no EU subsidiary that never adopted ESG pay in the 2011-2018 period.

Appendix table A1 presents the comparison of firm-level covariates for the treatment and control firms used in our main DiD analysis. Other than the expected significant difference in size between treatment and control firms, these firms are similar in other firm characteristics including book-to-market ratio, leverage, ROA, operating profit margin, and Tobin's Q.

5.2. ESG-linked pay and OPM

We begin by examining the relation between ESG-linked pay and operating profit margin for the ACWI sample in Table 5. In all regressions, we use year, country and Fama-French 17 industry fixed effects. Standard errors are clustered at the year and country level and all explanatory variables are

[13] We consider all US firms with EU subsidiaries are being affected by the Directive as we do not have data on the employee count at those EU subsidiaries. We acknowledge the possibility that some US firms with small EU presence may be incorrectly classified as affected firms. However, this measurement error should bias us against finding a result.

lagged by one year. In columns (1) and (2) the outcome variable is OPM in the following year and in columns (3) and (4), the outcome variable is OPM two years later.[14]

We find that firms which adopt ESG-linked compensation contracts are associated with higher OPM in the following years. Examining column (2), the coefficient estimate of lagged *ESGPAY* implies that firms with ESG-linked pay increase OPM by 1.224 (compared to the mean OPM of 15.47, i.e. firms with ESG-linked pay increase OPM by about 7.91%). Similarly, in column 4 the coefficient estimate of *ESGPAY* implies that firms which adopt ESG-linked pay increase OPM in year (*t*+2) by 1.255, which can be interpreted as firms with ESG-linked pay having operating profit margin in year (*t*+2) of 1.80% greater than firms without ESG-linked pay.

5.3. ESGPAY and profitability: identification

To address the endogeneity concern of our finding of the positive association between ESGPAY and OPM, we run DiD regressions. For each treatment firm and its matched control firm we include five annual observations centered around the event year (i.e., the year of ESG pay adoption)—event window [-2, +2]. Specifically, we estimate the following panel regression equation:

$$OPM_{i,t} = \beta_0 + \beta_1 Treat_i \times I_{(Year>EventYear),i,t} + \beta_2 Treat_i + \beta_3 I_{(Year>EventYear)\ i,t} + X_{i,t-1}\gamma + \sigma_t + \varepsilon_{it}$$

where the outcome variable, $OPM_{i,t}$, is operating profit margin for firm *i* of year *t*. $Treat_i$ equals one if firm *i* is a treated firm that first adopts ESG pay after the EU directive was enacted in 2014 and zero if firm *i* is a matched control firm (from the pool of U.S. firms with no EU subsidiaries and who never adopted ESG pay between 2011-2018). $I_{(Year>EventYear)\ i,t}$ is a dummy variable equal to one if year *t* is after the ESG adoption year (i.e., event year) for each treatment event (i.e., if event year falls in [+1, +2]), and zero otherwise. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including firm size, ROA, leverage, and book-to-market.

[14] We run a similar OLS regression for the whole sample of U.S. firms for which we have ESG pay adoption data from Bloomberg. Table A5 in the online appendix report the results. It turns out the association between ESG pay adoption and OPM in the following year and two years later is negative though it is only marginally significant for OPM in the following year.

Table 6 presents the results. Column (1) reports the regression results with no controls of fixed effects; column (2) reports the coefficients from regressions controlling for both industry and year fixed effects. In column (3), we add an additional dimension of fixed effects, switch-on-year (i.e., event year) FE, to the specification of column (2). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses.

As shown, the estimated coefficient on the interaction term, $Treat_i \times I_{(Year>EventYear),i,t}$, is positive and significant and remains relatively stable in magnitude, regardless of whether we control for industry, year, or event-year (i.e. switch-on-year) fixed effects. Treatment firms experience a significantly higher increase in operating profit margin post the adoption of ESG-linked pay relative to control firms. The economic magnitude of this increase is sizable: Column (3) shows that (after controlling for firm characteristics as well as industry and year and switch-on-year FE) treatment firms experience a larger increase of OPM after the adoption of ESG pay (following the 2014 enactment of the directive) compared to control firms by about 4.178 percent, which represents approximately 32% of the sample average OPM.

The identifying assumption for the application of DiD model is that of parallel trends. That is, to interpret the DiD estimates as due to the ESG-linked pay adoption of the treatment firms, one must assume that in the absence of the ESG-linked pay adoption, the outcome variables for the treated and control firms would exhibit parallel trend. Figure 4 plots the coefficient estimates and the corresponding 95% confidence intervals of $\text{Treat} \times \text{EventTimeDummy}$ interaction terms estimated using a dynamic Diff-in-Diff regression models for OPM controlling for time varying firm-level controls. We re-estimate our Diff-in-Diff models by replacing the Post dummy with indicator variables for different event years around the adoption of ESG pay. The regression model is specified as follows:

$$\begin{aligned}\text{OPM}_{\text{i,t}} \quad &= \beta_0 + \beta_1 \text{Treat} \times \text{D}(\text{t} = -2) + \beta_2 \text{Treat} \times \text{D}(\text{t} = -1) + \beta_3 \text{Treat} \times \text{D}(\text{t} = 0) \\ &\quad + \beta_4 \text{Treat} \times \text{D}(\text{t} = +1) + \beta_5 \text{Treat} \times \text{D}(\text{t} = +2\&3) + \beta_6 \text{D}(\text{t} = -2) \\ &\quad + \beta_7 \text{D}(\text{t} = -1) + \beta_8 \text{D}(\text{t} = 0) + \beta_9 \text{D}(\text{t} = +1) + \beta_9 \text{D}(\text{t} = +2\&3) + X_{i,t-1}\gamma \ (+\delta_t) \\ &\quad + e_{i,t},\end{aligned}$$

The variables of interests are the interaction terms between the event year dummies and the dummy variable *Treat*. The results reported in Figure 4 show that the coefficient of Treat× (year − 2), Treat× (year − 1)*treat and Treat× (year 0) are insignificant and that the coefficient of (year + 1)*treat is

significantly positive. These results support the parallel trend assumption and increased OPM after the adoption of ESG-linked pay as a response to the EU directive.

Another potential concern with this DiD methodology is that given the control firms are firms without EU subsidiary, the treatment firms and control firms may be different in certain (observable and unobservable) aspects that are either not matched on or controlled for. To alleviate this concern, we adopt an alternative strategy by estimating a panel regression of OPM on ESG pay adoption for the full sample of U.S. firms with EU subsidiaries (regardless of whether and when ESG pay is adopted by the firm) for the period of year 2012 through 2020.

For each firm our sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. We estimate the following panel regression equation:

$$OPM_{i,t} = \beta_0 + \beta_1 ESGPAY_{i,t-1} + \beta_2 Post2014Adopter_i + \beta_3 ESGPAY_{i,t-1} \times Post2014Adopter_i + X_{i,t-1}\gamma + \sigma_t\ (+\eta_i) + \varepsilon_{it}$$

where $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. $Post2014Adopter_i$ is a firm-level indicator that equals one if firm i first adopted ESG pay after the EU directive was enacted in 2014 and zero if firm i first adopted ESG pay prior to year 2014 or never adopted ESG pay during from 2011 through 2019. This indicator is equivalent to the treatment dummy in the Diff-in-Diff regressions as it identifies the same set of firms.

Table 7 presents the results. Column 1 reports the regression results with no controls of fixed effects; column 2 reports the coefficients from regressions controlling for both industry FE and year FE. Regression reported in column 3 controls for firm FE and year FE. The main coefficient of interest is the coefficient on the interaction term $ESGPAY_{i,t-1} \times Post2014Adopter_i$, which captures the difference in the ESGPAY-OPM association between post-2014 ESGPAY adopters (i.e., late adopters) and the pre-2014 ESGPAY adopters (i.e., early adopters). This coefficient is estimated to be positive and significant in our baseline specification in column 1 and remains significant when we add year and industry fixed effects.

As shown in column 2, when we interact ESGPAY with the post-2014 ESG pay adopter dummy (Post2014Adopter) in the specification that controls for industry FE and year FE, the coefficient on the interaction term is positive and significant at the 5% level. For a firm that adopted ESG pay after year

2014 when the directive took into effect, the coefficient of ESGPAY on OPM is larger by 3.55 than that of a firm who has adopted ESG pay before 2014. The stand-alone effect of ESGPAY on OPM (for early adopters of ESG pay) is negative and insignificant.

To interpret the association between ESG pay and OPM for late adopters, we add the coefficient on the interaction term to that on the stand-alone term of ESGPAY and perform a one-sided test of the linear combination of the coefficients containing *ESGPAY(t-1)* with the null hypothesis being that the sum of the coefficient on *ESGPAY(t-1)* and *ESGPAY(t-1) x Post2014Adopter* is smaller than or equal to zero. The null hypotheses are rejected at the 5% significance level as indicated by a p-value of 0.013. This association is economically significant—the adoption of ESG pay by late (i.e. post 2014) adopters is associated with an larger value of OPM by 2.47 (=3.55-1.08), which represents 23% of the sample average of OPM.

In column 3, we further restrict our analysis to within firm variation of ESG pay adoption by controlling for firm fixed effect. The coefficient on the interaction term *ESGPAY(t-1) x Post2014Adopter* remains significant, though only at the 10% level. The sum of the coefficient on the interaction term and that on the stand-alone term of ESGPAY is 1.79 (=4.72-2.93), which is significantly greater than zero. In terms of economic magnitude, it represents an increase of 17% of the sample average OPM when firms switch from no ESG pay to ESG pay status.

In Table A8 of the appendix we perform a full-sample panel regression analysis for the U.S. firms regardless of whether and when ESG pay is adopted by the firm and whether the firm has EU subsidiaries or not, for the extended period of year 2000 through 2020. For each firm the sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. We control for year fixed effect and firm fixed effect. $Post2014$ is an indicator variable that equals one if year t is after 2014. $EUsub$ is an indicator variable that equals one if the US firm has EU subsidiary. $Post2014AdopterWithEUsub_i$ is a firm-level indicator that equals one if firm i with EU subsidiary first adopted ESG pay after the EU directive was enacted in 2014 and zero if 1) firm i has no EU subsidiary, or 2) firm i first adopted ESG pay prior to year 2014 or never adopted ESG pay during from 2011 through 2019. This indicator is equivalent to the treatment dummy in the Diff-in-Diff

regressions as it identifies the same set of firms. The negative and significant coefficient on the interaction term, $ESGPAY_{t-1}$ X *Post2014,* reflects a general decline (i.e. negative change) in the link between ESG linked pay and OPM experiences a general decline. However, the significant positive coefficient on the interaction term $ESGPAY_{t-1}$ X *Post2014AdopterWithEUsub* indicates that when comparing the pre- to post-2014 change in the ESG Pay-OPM link, change for the late adopter firms with EU subsidiaries is significantly more positive than either US firms with no EU subsidiaries (hence no exposure to the regulation) or early adopters of US firms with EU subsidiary.

5.4. ESG Pay and ESG Ratings

In this section we analyze the impact of ESG-linked pay on the firm's ESG ratings. We first examine the relation between ESG-linked pay and operating profit margin for the ACWI sample in Table 8. In all regressions, we control for year, country and Fama-French 17 industry fixed effects, and lag all explanatory variables by one year. The inclusion of control variables mitigates the possibility that our findings are driven by omitted variables. In columns 1-3 the outcome variable is ESG ratings in the following year and in 4-6 the outcome variable is ESG ratings two years later. We find that firms which adopt ESG-linked compensation contracts are associated with higher environmental, social, and governance ratings in the following one year and two years.

Next, similar to our main DiD analysis for OPM, we run difference-in-differences regressions that estimate the effect of ESG pay adoption on ESG scores based on the same panel dataset. We estimate the following panel regression equation:

$$SCORE_{i,t} = \beta_0 + \beta_1 Treat_i \times I_{(Year>EventYear)\ i,t} + \beta_2 Treat_i + \beta_3 I_{(Year>EventYear)\ i,t} + X_{i,t-1}\gamma + \sigma_t + \varepsilon_{it}$$

where $SCORE_{i,t}$ represents three types of ESG scores (as reported by Bloomberg): SOSCORE (social), ENSCORE (environmental), and CGSCORE (corporate governance). $Treat_i$ equals one if firm i is a treated firm that first adopts ESG pay after the EU directive was enacted in 2014 and zero if firm i is a matched control firm (from the pool of U.S. firms with no EU subsidiary never adopting ESG pay between year 2011 and 2018). $I_{(Year>EventYear)\ i,t}$ is equal to one if year t is after the ESG adoption year for each treatment event (i.e., if event year falls in [+1, +2]) zero otherwise.

Table 9 reports the results. In column 4-6, we replace this indicator variable with $I_{(Year \geq EventYear)\ i,t}$ which is equal to one if year t is the same as or after the ESG adoption year for each treatment event (i.e., if event year falls in [0, +2]) zero otherwise. $X_{i,t-1}$ represents a vector of control variables similar to our previous specification. All the regressions control for industry FE, year FE, and switch-on-year FE. It turns out that the coefficient on the interaction term $Treat_i \times I_{(Year > EventYear)\ i,t}$ (or $Treat_i \times I_{(Year \geq EventYear)\ i,t}$) is positive for all three types of scores but is statistically significant only for SOSCORE (social score), which suggests that the adoption of ESGPAY by treatment firms as a response to the directive leads to a significant improvement in the social performance relative to control firms. Column 1 shows that (after controlling for firm characteristics as well as industry and year and switch-on-year FE) treatment firms experience a larger increase of SOSCORE after the adoption of ESG pay (following the 2014 enactment of the directive) compared to control firms by about 4.935 percent, which represents approximately 10% of the sample average SOSCORE. The estimated economic magnitude of the effect is similar when we change the definition of the post-even period by including event year in the post period as reported in column 2.

5.5. ESG-linked pay and Tobin's Q

We estimate difference-in-differences regressions to examine the effect of ESG pay adoption on Tobin's Q based following the same specification as used for the analysis for OPM and ESG ratings. Regardless of whether event year zero (i.e., the ESG pay adoption year) is counted as pre- or post-event period, we find (in untabulated results) that the coefficient on the interaction term is close to insignificant. [LP15][YS16][YS17]

A drawback of applying this specification to study the effect on Tobin's Q is that the sample size is limited (given a small set of treatment and control firms and a relatively short event window) to draw inferences on Tobin's Q that serves as a noisy measure of firm valuation. Therefore we supplement the DiD analysis with an alternative methodology by running panel regressions of Tobin's Q on ESG pay adoption for a larger sample that includes two types of firms: i) U.S. firms with EU subsidiaries that first adopted ESG pay after 2014 (this is identical to the treatment firms used for Diff-in-Diff analysis);

and ii) U.S. firms with no EU subsidiaries that never adopted ESG pay between 2011 and 2018 (this is the starting pool of firms where our DiD control firms are drawn from).

For each firm our sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. We estimate the following panel regression equation:

$$TobQ_{i,t}(TobQ_{i,t+1}) = \beta_0 + \beta_1 ESGPAY_{i,t-1} + X_{i,t-1}\gamma + \sigma_t\ (+\eta_i) + \varepsilon_{it}$$

where $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. This indicator is equivalent to *Treatment* the as it identifies the same set of firms.

As shown in Table 10, the coefficient on ESGPAY dummy is positive and significant for Tobin's Q when ESGPAY indicator is taken either from the previous year (columns 1-2) or lagged by two years (columns 3-4). The positive and significant effect of ESGPAY on Tobin's Q is robust to controlling for firm fixed effects. As shown in the within firm analysis results in column 2 and 4, Tobin's Q is significantly higher when firms adopt ESG-linked pay implying a positive valuation effect of ESGPAY adoption.

6. Conclusions

We find that country and industry factors play a major role in the adoption of ESG-linked pay contracts. Among firm characteristics, large size and value firms are more likely to adopt ESG-linked pay. Additionally, higher ESG scores in a given year increase the chance of adoption of ESG-linked executive compensation contracts in the following year. [RAA18]Finally, the adoption ESG-linked pay is positively associated with financial outcomes such as Tobin's Q and Operating profit margin[RAA19].

Taken together, these results indicate that ESG-linked pay contracts are likely to be a potent corporate governance tool in the future. Increased salience of ESG and an understanding of the role of stakeholders in providing corporate sustainability is likely to fuel more research into understanding key issues in ESG-linked compensation contracts. Greater data availability and improved measures of

objective ESG-linked pay will also add to academic and investor interest in ESG-linked executive compensation contracts.

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Exhibit 1:

Example: Alcoa – 2017 Proxy

The below chart describes the specific metrics and results for ParentCo and Alcoa for the 2016 annual IC awards:

Performance Metric[1]	ParentCo Targets	ParentCo Performance	Alcoa Targets	Alcoa Performance	Metric Weight (%)
Adjusted Free Cash Flow[2]	$ (710) M	$ (533) M	$ (247) M	$ 6 M	40%
Adjusted EBITDA[2]	$2,386 M	$2,360 M	$ 893 M	$1,002 M	40%
Safety[3] DART (measured in days away from work)	0.48	0.36	0.385	0.276	5%
Environmental[4] CO2 Emissions Reduction (thousand tons)	195	101	171	38.5	5%
Diversity (as percentage of workforce)					10%
Executive Level Women, Global	22.8%	23.2%	20.9%	20.9%	
Executive Level Minorities, U.S.	16.0%	16.1%	23.4%	24.3%	
Professional Level Women, Global	28.0%	28.3%	20.9%	20.7%	
Professional Level Minorities, U.S.	19.0%	18.6%	16.8%	17.6%	
Total	—	—	—	—	**100%**

(1) The maximum payout for each financial and non-financial metric is 200%.

(2) The free cash flow and EBITDA financial measures have not been calculated in accordance with generally accepted accounting principles ("GAAP"). A description of the calculation of each non-GAAP financial measure to the most directly comparable GAAP financial measure is provided in *"Calculation of Financial Measures"* in Attachment B.

(3) The safety metric focuses on reducing the number of serious injuries, based upon the DART (Days Away, Restricted and Transfer) rate, which measures injuries and illnesses that involve one or more days away from work per 100 full-time workers and days in which work is restricted or employees are transferred to another job due to injury per 100 full-time workers.

(4) The environmental metric relates to a reduction of carbon dioxide emissions in 2016.

Figure 1: Time-trend in ESG-linked pay
This figure shows the mean adoption rate of ESG-linked pay for the 1,729 firms which were in the ACWI index for 2009-2018 (2009 cohort). ESGPAY is an indicator equal to one if executive compensation is linked to ESG goals and 0 otherwise. The red line shows the adoption rate for all firms. The green line plots the adoption rate for firms in developed countries and the blue line shows the adoption rate for firms in emerging countries using the MSCI classification.

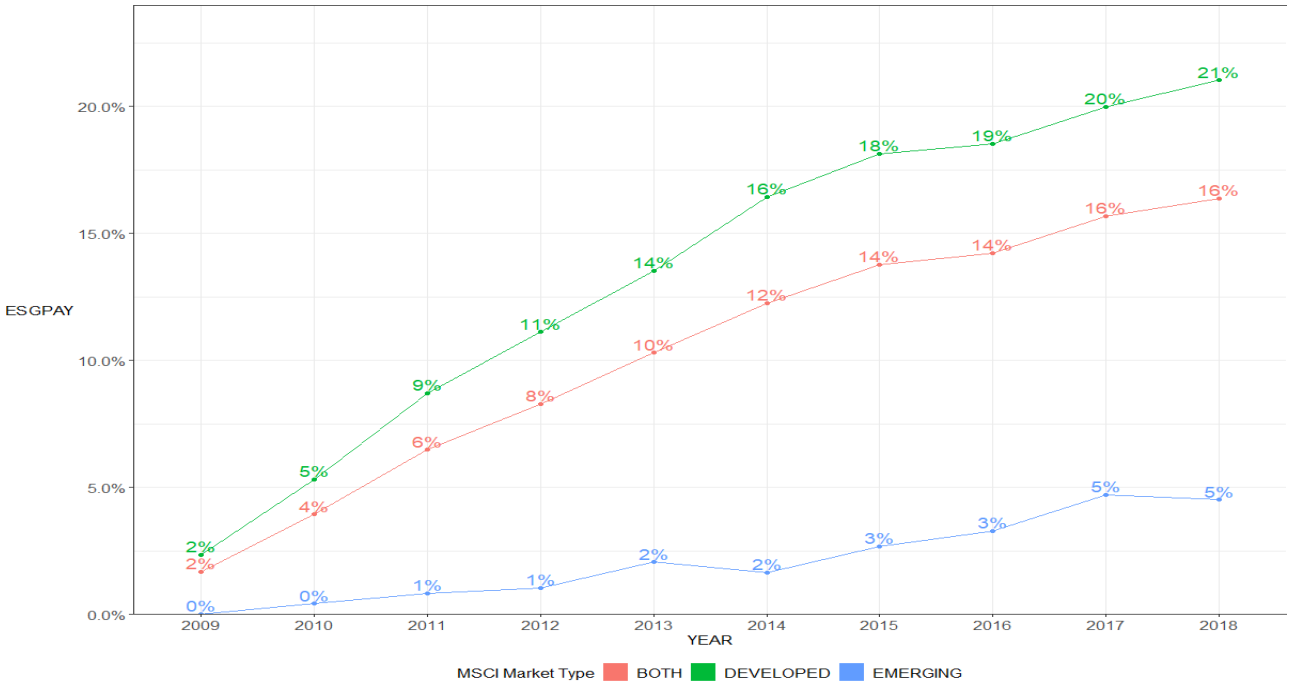
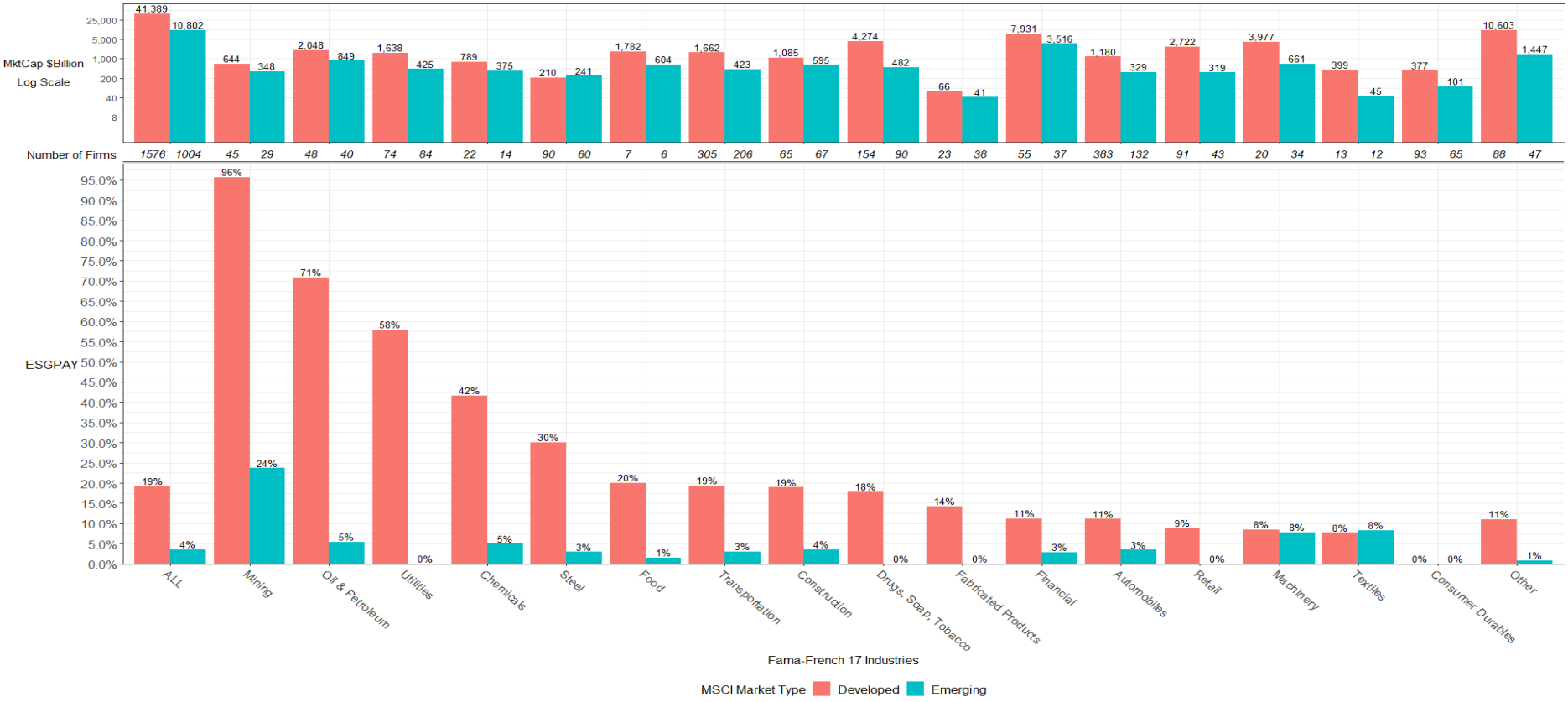


Figure 2: ESG-linked pay by industry

ESGPAY is an indicator equal to one if executive compensation is linked to ESG goals and 0 otherwise. Panel A shows the mean adoption rate of ESG-linked pay by industry for firms in the ACWI Index. The top panel shows the aggregate market capitalization of the sample firms by industry and market type at the end of June 2018 on a log scale. The central panel shows number of firms by industry and market type and the bottom panel presents the ESG-linked pay adoption rate by industry and market type. Panel B shows the mean adoption rate of ESG-linked pay across the 17 Fama-French industries for the sample of 1,729 firms in the ACWI Index for 2009-2018 (2009 cohort). ESG-linked pay is measured for the years 2009, 2013 and 2018.

Panel A: ESG-linked pay by market and industry



Panel B: ESG-linked pay by industry for the firms in the 2009 cohort

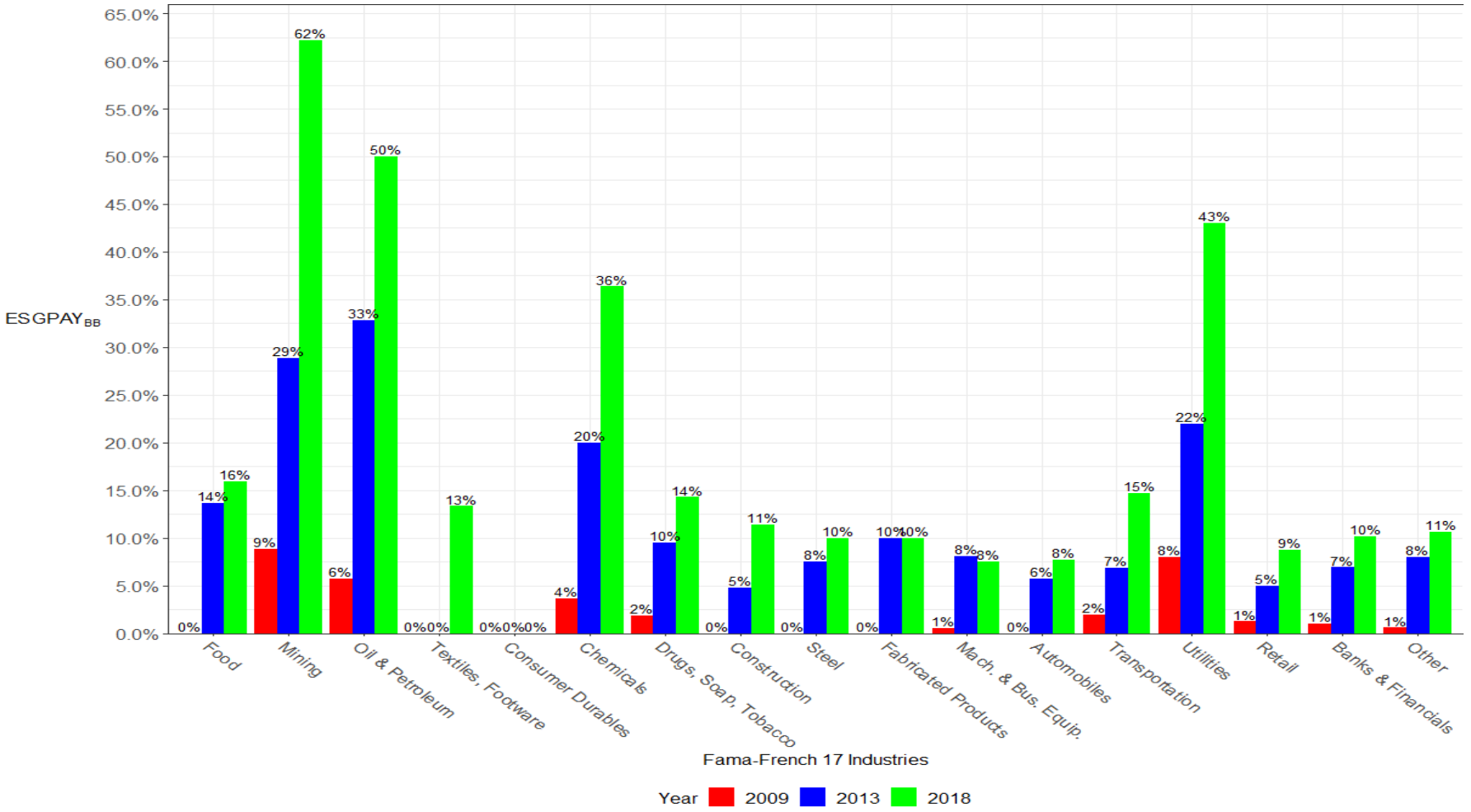


Figure 3: ESG-linked pay by country

This figure shows the mean adoption rate of ESG-linked pay by country for firms in the ACWI Index. ESGPAY is an indicator equal to one if executive compensation is linked to ESG goals and 0 otherwise. The top panel provides the aggregate market capitalization (in USD billion) of the sample firms by country in June 2018 on a log scale. The central panel presents the number of firms in each country and the bottom panel presents the adoption rate of ESG-linked pay by country. Sample is 2,580 firms which have non-missing ESGPAY in 2018.

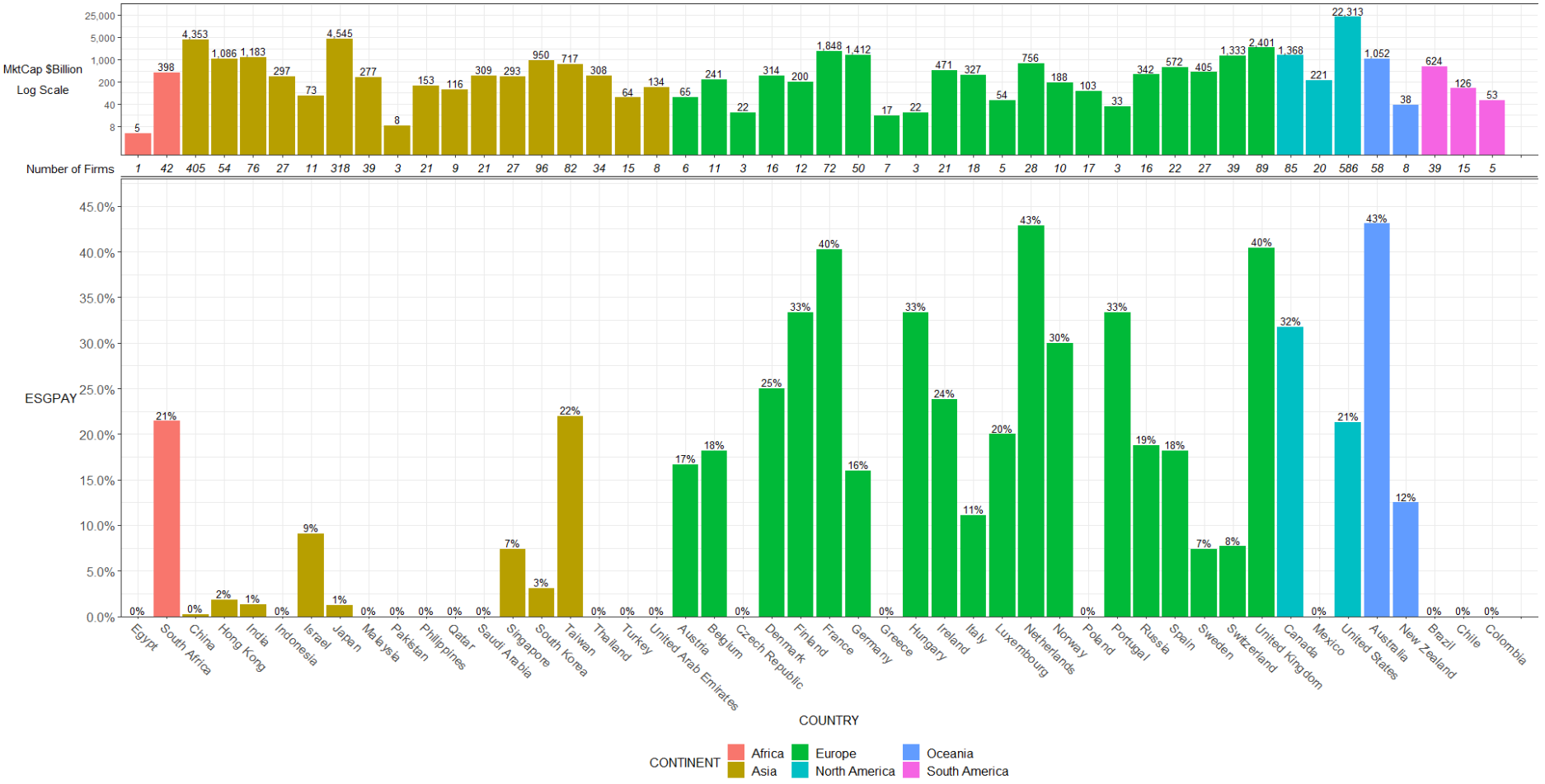


Figure 4: Parallel trend analysis –Dynamic Diff-in-Diff

The figures plot the coefficient estimates and their confidence intervals of $\mathrm{Treat} \times \mathrm{EventTimeDummy}$ interaction terms estimated using dynamic Diff-in-Diff regression models for OPM. We re-estimate our Diff-in-Diff models by replacing the Post dummy with indicator variables for different event years around the adoption of ESG pay. The variables of interests are the interaction terms between the event year dummies and Treat. The regression model is specified as follows:

$$\mathrm{OPM}_{i,t} = \beta_0 + \beta_1 \mathrm{Treat} \times \mathrm{D(t=-2)} + \beta_2 \mathrm{Treat} \times \mathrm{D(t=-1)} + \beta_3 \mathrm{Treat} \times \mathrm{D(t=0)} + \beta_4 \mathrm{Treat} \times \mathrm{D(t=+1)} + \beta_5 \mathrm{Treat} \times \mathrm{D(t=+2\&3)} + \beta_6 \mathrm{D(t=-2)} + \beta_7 \mathrm{D(t=-1)} + \beta_8 \mathrm{D(t=0)} + \beta_9 \mathrm{D(t=+1)} + \beta_9 \mathrm{D(t=+2\&3)} + X_{i,t-1}\gamma\ (+\delta_t) + e_{i,t},$$

The trend plot is created based on the regression model with no fixed effects.

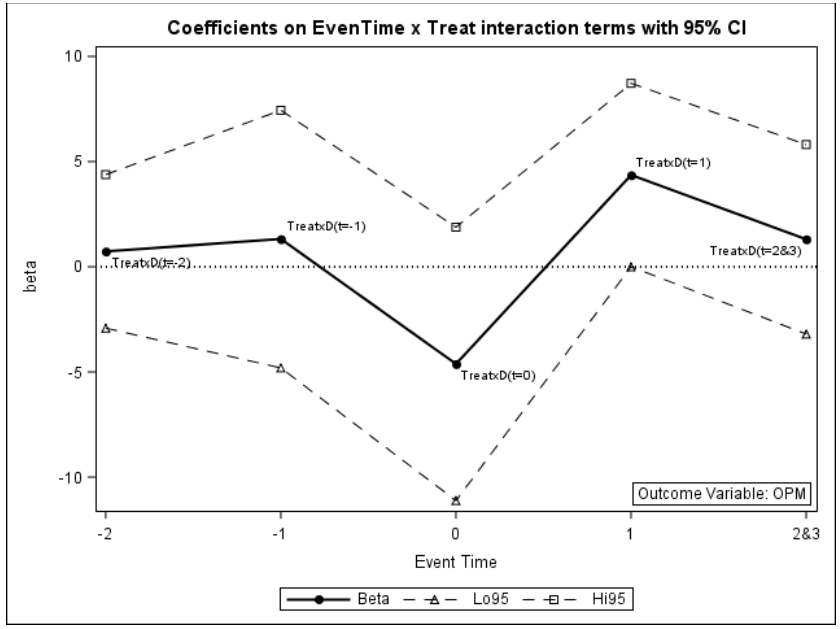


Table 1: Summary Statistics and Correlations

All variables are defined in the Appendix.

Panel A: Summary Statistics

Country-level variables						
	N	Mean	Standard deviation	Median	Skewness	Kurtosis
ESGPAY	48	0.08	0.09	0.06	1.17	3.83
Power distance	45	55.51	22.66	58.00	-0.01	2.33
Individualism	45	45.69	24.47	51.00	0.04	1.63
Masculinity/Femininity	45	51.18	19.12	53.00	-0.41	3.36
Uncertainty avoidance	45	64.33	23.91	69.00	-0.26	2.32
ADRI	38	4.18	0.87	4	-0.36	3.84
Civil origin	39	0.64	0.49	1	-0.59	1.35
French civil	39	0.38	0.49	0	0.47	1.23
Scandinavian civil	39	0.10	0.31	0	2.62	7.86
German civil	39	0.15	0.37	0	1.92	4.68
Corruption control	48	0.85	1.03	0.93	-0.15	1.64
Regulatory quality	48	0.94	0.79	1.09	-0.45	2.05

Firm-level variables						
	N	Mean	Standard deviation	Median	Skewness	Kurtosis
ESGPAY	23,068	0.09	0.28	0	2.90	9.40
Firm size	22,950	23.05	1.73	22.92	0.29	3.50
Book to market	22,094	-0.83	0.82	-0.74	-0.82	5.29
Leverage (%)	22,814	24.58	17.62	23.10	0.55	2.74
ROA (%)	22,691	6.49	6.71	5.35	0.80	5.73
Earnings volatility	21,700	2.95	3.62	1.78	2.86	12.90
IVOL	21,977	28.57	14.10	25.14	1.38	5.01
Firm age	22,041	64.80	55.17	48	2.03	12.19
Institutional Ownership (%)	21,666	42.40	29.70	33.36	0.61	2.10
CGSCORE	18,465	55.08	22.79	57.24	-0.27	2.12
ENSCORE	18,460	43.82	29.58	46.06	-0.06	1.71
SOSCORE	18,460	48.88	24.96	49.34	-0.05	2.03
Tobin's Q	22,876	1.94	1.46	1.40	2.70	11.43
Operating profit margin	22,899	15.44	13.41	12.94	0.67	4.30

Panel B: Pairwise Correlations

Country-level Variables													
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) *ESGPAY*	1.00												
(2) Power distance	**-0.54**	1.00											
(3) Individualism	**0.66**	**-0.66**	1.00										
(4) Masculinity/Femininity	-0.23	0.08	0.05	1.00									
(5) Uncertainty avoidance	-0.14	0.16	-0.16	0.14	1.00								
(6) ADRI	-0.04	0.08	-0.29	-0.11	0.05	1.00							
(7) *Civil origin*	0.00	0.06	-0.12	-0.19	**0.51**	0.04	1.00						
(8) French civil	-0.08	0.47	-0.22	-0.05	**0.56**	-0.04	0.59	1.00					
(9) Scandinavian civil	0.20	-0.38	0.26	-0.64	-0.32	-0.07	0.25	-0.27	1.00				
(10) German civil	-0.06	-0.21	-0.09	0.36	0.20	0.16	0.32	-0.34	-0.14	1.00			
(11) Corruption control	**0.57**	**-0.65**	**0.60**	-0.22	-0.34	-0.12	-0.05	-0.45	0.42	0.18	1.00		
(12) Regulatory quality	**0.56**	**-0.66**	**0.59**	-0.14	-0.31	-0.12	-0.10	-0.44	0.32	0.20	**0.95**	1.00	
(13) Ln(Lagged GDP per capita)	**0.53**	**-0.56**	**0.59**	-0.11	-0.09	-0.22	0.08	-0.30	0.32	0.26	**0.86**	**0.86**	1.00

Correlations of 0.5 or more in bold.

Firm-level Variables											
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) *ESGPAY*	1.00										
(2) *Firm size*	0.19	1.00									
(3) *Book to market*	0.02	0.47	1.00								
(4) *Leverage*	0.05	0.12	0.05	1.00							
(5) ROA	-0.03	-0.35	-0.49	-0.18	1.00						
(6) *Earnings volatility*	0.02	-0.29	-0.17	-0.02	0.11	1.00					
(7) *IVOL*	-0.16	-0.25	0.07	0.03	-0.11	0.21	1.00				
(8) *Firm age*	0.13	0.33	0.11	-0.02	-0.09	-0.14	-0.19	1.00			
(9) *Institutional ownership*	0.17	0.06	-0.18	0.03	0.03	0.12	-0.19	0.12	1.00		
(10) Tobin's Q	-0.05	**-0.53**	**-0.71**	-0.20	0.52	0.24	0.04	-0.14	0.11	1.00	
(11) Operating profit margin	0.02	0.02	-0.17	-0.04	0.36	-0.01	-0.17	-0.07	0.02	0.17	1.00

Correlations of 0.5 or more in bold.

Table 2: ESG-linked pay and industry characteristics

This table shows OLS, probit and logit regressions for ESG-linked pay for 2009-2018. The dependent variable is firm-level *ESGPAY*. We include fixed effects for all industries in the regressions. In Panel A, we report only the industries with significant results. In Panel B, extractive industries are based on Dyck *et al*. (2019) and sin stocks are based on Hong and Kacperczyk (2009). Standard errors are clustered by year and country. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All variables are defined in the Appendix.

Panel A: Fama-French 17 Industries			
	(1)	(2)	(3)
ESGPAY	OLS	Probit	Logit
IND 1 (Food)	0.086*	0.715***	1.299***
	(2.11)	(3.99)	(3.72)
IND 2 (Mining)	0.298**	2.014***	3.645***
	(2.85)	(13.23)	(13.75)
IND 3 (Oil & Petroleum)	0.267**	1.620***	2.944***
	(2.88)	(9.81)	(10.93)
IND 6 (Chemicals)	0.148*	1.164***	2.102***
	(2.22)	(4.25)	(4.11)
IND 7 (Consumer Durables)	0.065*	0.518***	0.952***
	(2.09)	(2.84)	(2.86)
IND 8 (Construction)	0.068***	0.536***	0.998***
	(3.27)	(3.00)	(3.27)
IND 9 (Steel)	0.103**	1.073***	1.940***
	(2.91)	(3.972)	(3.72)
IND 11 (Machinery and Business Equipment)	0.027*	0.221*	0.349
	(1.98)	(1.86)	(1.39)
IND 13 (Transportation)	0.050***	0.414***	0.745***
	(3.28)	(4.14)	(4.15)
IND 14 (Utilities)	0.221**	1.452***	2.631***
	(2.47)	(8.47)	(9.45)
Year and country fixed effects	Yes	Yes	Yes
Observations	22,988	21,933	21,933
Adjusted R^2	0.20		
Log likelihood		-4436.86	-4416.59

Panel B: Extractive Industries and Sin Stocks			
	(1)	(2)	(3)
ESGPAY	OLS	Probit	Logit
Extractive industries	0.235**	1.334***	2.417***
	(3.09)	(12.54)	(16.01)
Sin Stocks	0.043	0.330	0.572
	(0.53)	(0.68)	(0.60)
Constant	0.073***	-0.780***	-1.305***
	(12.65)	(-20.87)	(-27.54)
Year and country fixed effects	Yes	Yes	Yes
Observations	22,988	21,933	21,933
Adjusted R^2	0.16		
Log Likelihood		-4881.50	-4871.66

Table 3: ESG-linked pay and country characteristics

This table shows OLS, probit and logit regressions for ESG-linked pay for 2009-2018. The dependent variable is firm-level ESGPAY. Standard errors are clustered by year and country. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All variables are defined in the Appendix.

	(1)	(2)	(3)	(4)	(5)
ESGPAY	OLS	OLS	OLS	Probit	Logit
Power distance	0.001	0.001*	0.001	0.006	0.017
	(0.453)	(1.879)	(0.875)	(0.838)	(0.984)
Individualism	0.003***	0.004***	0.004***	0.035***	0.070***
	(3.774)	(4.780)	(5.039)	(5.158)	(4.498)
Masculinity/Femininity	-0.001	-0.001*	-0.001*	-0.013***	-0.022**
	(-1.432)	(-1.870)	(-2.259)	(-2.705)	(-2.175)
Uncertainty avoidance	-0.000	-0.000	-0.001	-0.013**	-0.026*
	(-0.601)	(-0.357)	(-1.476)	(-2.011)	(-1.897)
ADRI		0.037**	0.033**	0.205***	0.412***
		(2.669)	(2.354)	(3.413)	(3.460)
French civil			0.064	0.614**	1.214**
			(1.633)	(2.245)	(2.334)
Scandinavian civil			-0.082	-0.458	-0.679
			(-1.407)	(-1.076)	(-0.840)
German civil			0.041	0.610*	1.182
			(0.991)	(1.781)	(1.551)
Ln(Lagged GDP per capita)	0.007	0.032	0.031	0.381**	0.879**
	(0.304)	(1.189)	(1.226)	(2.062)	(2.097)
Corruption control	0.013	-0.027	-0.005	-0.215	-0.314
	(0.413)	(-1.089)	(-0.203)	(-0.978)	(-0.750)
Regulatory quality	0.007	0.032	0.005	0.125	-0.007
	(0.189)	(0.680)	(0.111)	(0.428)	(-0.012)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	21,739	17,724	17,724	17,724	17,724
Adjusted R^2	0.170	0.190	0.193	.	.
Log likelihood				-4,242.803	-4,219.241

Table 4: Firm-level regressions

This table presents probit and logit regressions for firm-level ESG-linked pay. All right-hand side variables are lagged. Intercept, year, country indicators and industry dummies based on the Fama-French 17 classification are included in all regressions but not reported. Standard errors are clustered by year and country. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. All variables are defined in the Appendix.

	(1)	(2)	(3)	(4)	(5)
ESGPAY	OLS	OLS	OLS	Probit	Logit
Firm size	0.025*	0.026*	0.029**	0.258***	0.486***
	(2.10)	(2.19)	(2.55)	(4.36)	(4.31)
Book-to-market	-0.005	-0.004	-0.000	0.101**	0.206**
	(-0.88)	(-0.76)	(-0.02)	(2.02)	(1.98)
Leverage		-0.000	-0.000	0.000	0.001
		(-1.82)	(-1.44)	(0.10)	(0.17)
ROA		0.000	0.001	0.011*	0.018
		(0.37)	(0.91)	(1.88)	(1.64)
Earnings volatility			0.000	-0.004	-0.007
			(0.25)	(-0.69)	(-0.55)
IVOL			-0.000	-0.006	-0.011
			(-0.22)	(-1.44)	(-1.36)
Firm age			0.000	0.000	0.000
			(0.17)	(0.19)	(0.25)
Institutional ownership			-0.000	0.000	0.000
			(-0.44)	(0.08)	(0.06)
Year, country and industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	22,094	21,873	18,926	17,724	17,724
Adjusted R^2	0.214	0.215	0.220		
Log Likelihood				-5824.356	-5824.356

Table 5: ESGPAY and OPM - OLS Outcomes Regressions

This table displays OLS regressions of ESG-linked pay on outcome variables. All right-hand side variables are lagged. Intercept, year, country and industry indicators based on the Fama-French 17 classification included in the regressions but not reported. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	(1) OPM_t	(2) OPM_t	(3) OPM_{t+1}	(4) OPM_{t+1}
$ESGPAY_{t-1}$	0.767	1.224**	1.129**	1.255**
	(1.51)	(2.41)	(2.18)	(2.43)
Firm size $_{t-1}$	0.126	0.136	-0.158	-0.204
	(0.86)	(0.88)	(-1.06)	(-1.28)
Book-to-market $_{t-1}$	-1.037***	-1.116***	-1.037***	-0.976***
	(-3.74)	(-4.05)	(-3.74)	(-3.51)
Leverage $_{t-1}$	0.025**	0.029**	0.028**	0.032***
	(2.07)	(2.45)	(2.33)	(2.70)
ROA $_{t-1}$	0.900***	0.890***	0.754***	0.741***
	(26.67)	(26.32)	(22.68)	(21.96)
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects		Yes		Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	21,710	21,710	21,723	21,723
Adjusted R^2	0.304	0.343	0.267	0.308

Table 6: ESG Pay and OPM - Difference-in-Differences Analysis

This table reports results from difference-in-differences regressions that estimate the effect of ESG pay adoption on operating performance margin (OPM) based on a panel dataset. For each treatment firm and its matched control firm we include five annual observations centered around the event year (i.e., the year of ESG pay adoption)—event window [-2, +2]. We estimate the following panel regression equation:

$$OPM_{i,t} = \beta_0 + \beta_1 Treat_i \times I_{(Year>EventYear),i,t} + \beta_2 Treat_i + \beta_3 I_{(Year>EventYear)\ i,t} + X_{i,t-1}\gamma + \sigma_t + \varepsilon_{it}$$

where the outcome variable, $OPM_{i,t}$, is operating performance margin for firm i of year t. $Treat_i$ equals one if firm i is a treated firm that first adopts ESG pay after the EU directive was enacted in 2014 and zero if firm i is a matched control firm (from the pool of U.S. firms with no EU subsidiary never adopting ESG pay between year 2011 and 2018). $I_{(Year>EventYear)\ i,t}$ is a dummy variable that is equal to one if year *t* is after the ESG adoption year (i.e., event year) for each treatment event (i.e., if event year falls in [+1, +2]) zero otherwise. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Column 1 reports the regression results with no controls of fixed effects; column 2 reports the coefficients from regressions controlling for both industry FE and year FE. In column 3, we add an additional dimension of FE, switch-on-year (i.e., event year) FE, to the specification of column 2. Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1) OPM	(2) OPM	(3) OPM
Treat × $I_{(Year>EventYear)}$	4.052**	4.130**	4.178**
	(2.20)	(2.16)	(2.20)
Treat	-4.660**	-3.768*	-3.983**
	(-2.08)	(-1.93)	(-2.04)
$I_{(Year>EventYear)}$	-1.771	-2.143	1.753
	(-1.61)	(-1.16)	(0.66)
Firm size $_{t-1}$	3.565***	2.115***	2.280***
	(6.95)	(4.97)	(4.62)
ROA $_{t-1}$	0.754***	0.857***	0.859***
	(5.14)	(5.79)	(5.52)
Leverage $_{t-1}$	0.002	0.024	0.024
	(0.02)	(0.43)	(0.41)
Book-to-market $_{t-1}$	-2.224	-2.671	-2.729
	(-1.07)	(-1.32)	(-1.36)
Constant	-70.051***	-39.288***	-44.489***
	(-5.87)	(-4.10)	(-4.05)
Observations	637	637	637
Adjusted R-squared	0.401	0.472	0.481
Industry FE	No	Yes	Yes
Year FE	No	Yes	Yes
SwitchOnYear FE	No	No	Yes

Table 7: ESG Pay and Firm Performance –Panel regressions with no matching

This table reports results from panel regressions of operating performance margin on ESG pay adoption for **the full sample of U.S. firms with EU subsidiaries** (regardless of whether and when ESG pay is adopted by the firm) and the period of year 2012 through 2020. For each firm our sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. We estimate the following panel regression equation:

$$OPM_{i,t} = \beta_0 + \beta_1 ESGPAY_{i,t-1} + \beta_2 Post2014Adopter_i + \beta_3 ESGPAY_{i,t-1} \times Post2014Adopter_i + X_{i,t-1}\gamma + \sigma_t\ (+\eta_i) + \varepsilon_{it}$$

where $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. $Post2014Adopter_i$ is a firm-level indicator that equals one if firm i first adopted ESG pay after the EU directive was enacted in 2014 and zero if firm i first adopted ESG pay prior to year 2014 or never adopted ESG pay during from 2011 through 2019. This indicator is equivalent to the treatment dummy in the Diff-in-Diff regressions as it identifies the same set of firms. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio).Column 1 reports the regression results with no controls of fixed effects; column 2 reports the coefficients from regressions controlling for both industry FE and year FE. Regression reported in column 3 controls for firm FE and year FE. Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels. We perform one-sided tests of the linear combination of the coefficients containing *ESGPAY(t-1)* with the null hypothesis being that the sum of the coefficient on *ESGPAY(t-1)* and *ESGPAY(t-1) x Post2014Adopter* is smaller than or equal to zero. The null hypotheses are rejected at the 5% significance level as indicated by the p-values for the tests reported at the bottom of this table.

	(1) OPM	(2) OPM	(3) OPM
ESGPAY$_{t-1}$ x *Post2014Adopter*	5.22***	3.55**	4.72*
	(3.34)	(2.28)	(1.87)
Post2014Adopter	-0.66	-0.72	
	(-0.53)	(-0.64)	
ESGPAY$_{t-1}$	-2.91***	-1.08	-2.93
	(-2.67)	(-0.90)	(-1.23)
Firm size $_{t-1}$	2.66***	2.32***	1.40
	(12.02)	(10.06)	(1.56)
ROA $_{t-1}$	0.03	0.02	-0.05
	(1.28)	(0.97)	(-1.58)
Leverage $_{t-1}$	1.05***	1.05***	0.30***
	(19.01)	(20.89)	(6.81)
Book-to-market $_{t-1}$	0.35	-0.50	-3.68***
	(0.78)	(-1.08)	(-7.27)
Constant	-53.04***	-46.52***	-23.84
	(-11.52)	(-9.62)	(-1.23)
Observations	7543	7543	7539
Adjusted R-squared	0.463	0.505	0.790
Year FE	No	Yes	Yes
Industry FE	No	Yes	-
Firm FE	No	No	Yes
<Test> H0: ESGPAY(t-1) coef + ESGPAY(t-1) x Post2014Adopter coef ≤0			
p-value	0.024	0.013	0.025

Table 8: ESPAY and ESG Ratings - OLS Outcome Regressions

This table displays OLS regressions of ESG-linked pay on outcome variables. All right-hand side variables are lagged. Intercept, year, country and industry indicators based on the Fama-French 17 classification included in the regressions but not reported. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	(1) $CGSCORE_t$	(2) $ENSCORE_t$	(3) $SOCSCORE_t$	(4) $CGSCORE_{t+1}$	(5) $ENSCORE_{t+1}$	(6) $SOCSCORE_{t+1}$
$ESGPAY_{t-1}$	8.107***	5.138***	5.406***	8.172***	4.835***	5.177***
	(8.11)	(4.17)	(5.71)	(7.94)	(3.86)	(5.35)
$Firm\ size_{t-1}$	6.234***	10.494***	8.084***	6.143***	10.394***	7.971***
	(22.14)	(31.03)	(28.74)	(21.72)	(31.10)	(28.56)
$Book\text{-}to\text{-}market_{t-1}$	-1.714***	-1.784***	-3.107***	-1.836***	-1.887***	-3.221***
	(-3.27)	(-2.85)	(-6.01)	(-3.45)	(-2.97)	(-6.18)
$Leverage_{t-1}$	-0.035	0.018	-0.035	-0.039*	0.018	-0.041*
	(-1.52)	(0.64)	(-1.50)	(-1.65)	(0.63)	(-1.70)
ROA_{t-1}	0.149***	0.292***	0.204***	0.151***	0.276***	0.191***
	(2.72)	(4.67)	(3.94)	(2.72)	(4.36)	(3.70)
Year, country and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,406	18,402	18,402	16,524	16,522	16,522
Adjusted R^2	0.192	0.404	0.413	0.194	0.404	0.416

Table 9: ESG Pay and ESG Ratings - Difference-in-Differences Analysis

This table reports results from difference-in-differences regressions that estimate the effect of ESG pay adoption on ESG scores based on a panel dataset. For each treatment firm and its matched control firm we include five annual observations centered around the event year (i.e., the year of ESG pay adoption)—event window [-2, +2]. We estimate the following panel regression equation:

$$SCORE_{i,t} = \beta_0 + \beta_1 Treat_i \times I_{(Year>EventYear)\ i,t} + \beta_2 Treat_i + \beta_3 I_{(Year>EventYear)\ i,t} + X_{i,t-1}\gamma + \sigma_t + \varepsilon_{it}$$

where $SCORE_{i,t}$ represents three types of ESG scores (as reported by Bloomberg): SO (social), EN (environmental), and CG (corporate governance). $Treat_i$ equals one if firm i is a treated firm that first adopts ESG pay after the EU directive was enacted in 2014 and zero if firm i is a matched control firm (from the pool of U.S. firms with no EU subsidiary never adopting ESG pay between year 2011 and 2018). $I_{(Year>EventYear)\ i,t}$ is equal to one if year t is after the ESG adoption year for each treatment event (i.e., if event year falls in [+1, +2]) zero otherwise. In column 4-6, we replace this indicator variable with $I_{(Year\geq EventYear)\ i,t}$ which is equal to one if year t is the same as or after the ESG adoption year for each treatment event (i.e., if event year falls in [0, +2]) zero otherwise. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). All the regressions control for industry FE, year FE, and switch-on-year FE. Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)

	SOSCORE	SOSCORE	ENSCORE	ENSCORE	CGSCORE	CGSCORE
Treat × $I_{(Year \geq EventYear)}$	4.935**		2.481		0.021	
	(2.19)		(0.91)		(0.01)	
$I_{(Year \geq EventYear)}$	-3.103		-1.605		3.634	
	(-1.39)		(-0.80)		(1.55)	
Treat × $I_{(Year \geq EventYear)}$		5.015**		3.037		0.082
		(2.12)		(1.21)		(0.03)
$I_{(Year \geq EventYear)}$		-1.955		-2.039		-0.418
		(-0.98)		(-0.90)		(-0.18)
Treat	9.235**	8.122**	14.948***	14.064***	10.449**	10.391**
	(2.44)	(2.08)	(2.98)	(2.68)	(2.43)	(2.28)
Firm size $_{t-1}$	5.558***	5.580***	7.394***	7.407***	2.845**	2.857**
	(4.47)	(4.51)	(4.25)	(4.26)	(2.44)	(2.44)
ROA $_{t-1}$	0.038	0.029	-0.035	-0.039	0.092	0.090
	(0.21)	(0.17)	(-0.18)	(-0.21)	(0.69)	(0.67)
Leverage $_{t-1}$	0.122	0.121	0.062	0.061	-0.046	-0.045
	(1.32)	(1.30)	(0.52)	(0.51)	(-0.46)	(-0.45)
Book-to-market $_{t-1}$	-4.457**	-4.493**	-3.226	-3.236	2.858	2.808
	(-2.10)	(-2.13)	(-1.10)	(-1.11)	(1.10)	(1.08)
Constant	-91.035***	-91.548***	-144.492***	-144.134***	-8.917	-7.478
	(-3.27)	(-3.28)	(-3.79)	(-3.79)	(-0.34)	(-0.29)
Observations	535	535	535	535	535	535
Adjusted R-squared	0.435	0.435	0.428	0.428	0.214	0.213
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
SwitchOnYear FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: ESG Pay and Tobin's Q – Panel regressions with no matching

This table reports results from panel regressions of Tobin's Q on ESG pay adoption for a sample that includes two types of firms: i) U.S. firms with EU subsidiaries that first adopted ESG pay after 2014 (this is identical to the treatment firms used for Diff-in-Diff analysis); and ii) U.S. firms with no EU subsidiaries that never adopted ESG pay between 2011 and 2018. For each firm our sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. We estimate the following panel regression equation:

$$TobQ_{i,t}(TobQ_{i,t+1}) = \beta_0 + \beta_1 ESGPAY_{i,t-1} + X_{i,t-1}\gamma + \sigma_t\ (+\eta_i) + \varepsilon_{it}$$

where $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. This indicator is equivalent to the as it identifies the same set of firms. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1) TobQ	(2) TobQ	(3) TobQ(t+1)	(4) TobQ(t+1)
ESGPAY $_{t-1}$	0.27**	0.14*	0.33**	0.21**
	(2.41)	(1.65)	(2.37)	(2.12)
Firm size $_{t-1}$	-0.14***	-0.35***	-0.14***	-0.33***
	(-6.35)	(-3.77)	(-5.99)	(-4.83)
ROA $_{t-1}$	-1.07***	-0.53***	-0.95***	-0.19**
	(-17.44)	(-7.45)	(-11.14)	(-2.14)
Leverage $_{t-1}$	-0.01***	-0.00	-0.01***	-0.00
	(-6.41)	(-1.31)	(-5.14)	(-0.01)
Book-to-market $_{t-1}$	-0.00	0.01	-0.00	0.00
	(-0.31)	(1.48)	(-0.07)	(0.23)
Constant	4.10***	8.92***	4.24***	8.63***
	(9.21)	(4.55)	(8.71)	(6.05)
Observations	7568	7567	6799	6798
Adjusted R-squared	0.461	0.624	0.308	0.510
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	-	Yes	-
Firm FE	No	Yes	No	Yes

Appendix

Variable Definition

Variable	Source	Definition
Dependent variables		
ESGPAY	Bloomberg	Indicator equal to one if executive compensation is linked to ESG goals, zero otherwise *(ESG_LINKED_BONUS)*
Tobin's Q	Worldscope	[Market Cap (*WC07210*) + Total Assets (*WC07230*) – Common Equity (*WC07220*)]/Total Assets (*WC07230*)
Operating profit margin	Worldscope	Operating profit margin (*WC08316*)
Country Characteristics		
ADRI	La Porta *et al.* (1998), Djankov *et al.* (2008), Spamann (2010)	The Anti-Director Rights Index (ADRI) is a measure of investor protection against corporate management. ADRI consists of the same six key components: (1) proxy by mail allowed, (2) shares not blocked before shareholder meeting, (3) cumulative voting and proportional representation, (4) oppressed minority protection, (5) preemptive rights to new share issues, (6) percentage of share capital to call an extraordinary shareholder meeting. Each component is an indicator variable, and the ADRI is formed by aggregating the value of all six components. The index ranges from 0 to 6, whereby a higher value of the index indicates stronger shareholder protection.
Corruption control	World Bank Governance Indicators	The extent to which public power is exercised for private gain, including petty and grand forms of corruption, as well as the "capture" of the state by elites and private interests. Coded from –2.5 to 2.5, with higher values corresponding to better governance outcomes
Regulatory quality	World Bank Governance Indicators	The ability of the government to implement sound policies and regulations that promote private sector development. Coded from –2.5 to 2.5, with higher values corresponding to higher levels of regulatory quality.
Legal origin	La Porta *et al.* (1998), Djankov *et al.* (2008), La Porta *et al.* (2008), and Spamann (2010)	The legal origin of the company law or commercial code of the country.
Civil origin		Indicator equal to one for civil law countries and zero for common law countries.
French civil		Indicator equal to one for countries with legal origins in French civil law, zero otherwise.
Scandinavian civil		Indicator equal to one for countries with legal origins in Scandinavian civil law, zero otherwise.
German civil		Indicator equal to one for countries with legal origins in German civil law, zero otherwise.
Power distance	Geert Hofstede's website	Power distance expresses the degree to which the less powerful members of a society accept and expect that power is distributed unequally. A higher score indicates a large power distance between individuals.
Individualism	*Ibid.*	The high side of this dimension, called Individualism, indicates a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. Its opposite, Collectivism, represents a preference for a tightly-knit framework in society in which individuals can expect their relatives or members of a particular ingroup to look after them in exchange for unquestioning loyalty. A society's position on this dimension is reflected in whether people's self-image is defined in terms of "I" or "we."
Masculinity/Femininity	*Ibid.*	The Masculinity side of this dimension represents a preference in society for achievement, heroism, assertiveness, and material

		rewards for success. Society at large is more competitive. Its opposite, Femininity, stands for a preference for cooperation, modesty, caring for the weak and quality of life. Society at large is more consensus-oriented. In the business context Masculinity versus Femininity is sometimes also related to as "tough versus tender" cultures.
Uncertainty avoidance	*Ibid.*	The Uncertainty Avoidance dimension expresses the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. The fundamental issue here is how a society deals with the fact that the future can never be known: should we try to control the future or just let it happen? Countries exhibiting strong UAI maintain rigid codes of belief and behaviour, and are intolerant of unorthodox behaviour and ideas. Weak UAI societies maintain a more relaxed attitude in which practice counts more than principles.

Firm-level variables

Firm size	Worldscope	Log of total assets in $ *(log of WC07230)*
Book-to- market	Datastream	Log of book-to-market ratio *(MTBV)*
Institutional ownership	Capital IQ	Institutional ownership. Winsorized at 1st and 99th percentiles
Firm age	Worldscope	Age in years at the end of previous fiscal year divided by 100 *(WC18273)*
Earnings volatility	Worldscope	Standard deviation of past five-years of deflated earnings (Net Income/Avg Assets Winsorized at 1st and 99th percentiles.
IVOL*	Datastream	Annualized standard deviation of residuals from Fama-French five-factor global model using last 120 daily returns of previous fiscal year (%) (See Bali et al 2016)
Leverage	Worldscope	Debt/Assets *(WC08236)* Winsorized at 1st and 99th percentiles
ROE	Worldscope	Net income normalized by total equity *(WC08301)*
ROA*	Worldscope	Net income normalized by total assets *(WC08326)*
ENSCORE	Asset4	Environmental Score from Asset4
CGSCORE	Asset4	Corporate Governance Score from Asset4
SOSCORE	Asset4	Social Score from Asset4
A4ENSCORE	Asset4	Environment score after Gram-Schmidt Orthogonalization
A4CGSCORE	Asset4	Corporate Governance score after Gram-Schmidt Orthogonalization
A4SOSCORE	Asset4	Social score after Gram-Schmidt Orthogonalization
Developed market	MSCI	1 for developed markets, 0 otherwise

Table A1: Diff-in-Diff Sample Summary Statistics

This table presents the comparison of firm-level covariates for treatment and control firms used for the Diff-in-Diff analysis. Each treatment firm is matched to one control firm operating in the same Fama French 17 Industry with the smallest Mahalanobis Distance (matched on Size, Book-to-Market, and Tobin's Q) from the pool of U.S. firms with no EU subsidiary that never adopted ESG pay in the 2011-2018 period.

Variable	Group	N	Mean	p25	Median	p75	T-test p-val	KS-test p-val
SIZE	TREAT	64	22.705	21.895	22.435	23.51	0.009	0.013
	CONTROL	64	21.782	20.36	21.931	22.798		
LNBM	TREAT	64	-0.853	-1.336	-0.805	-0.372	0.343	0.301
	CONTROL	64	-0.734	-1.085	-0.634	-0.354		
LEV	TREAT	64	26.016	12.117	24.523	35.615	0.418	0.022
	CONTROL	64	23.249	4.503	15.36	39.403		
ROA	TREAT	64	5.133	2.925	5.397	8.053	0.868	0.839
	CONTROL	64	4.798	2.902	5.35	9.353		
OPM	TREAT	64	12.038	6.193	11.917	19.252	0.373	0.211
	CONTROL	64	14.589	8.503	13.35	25.66		
Q	TREAT	64	1.761	1.191	1.537	1.933	0.975	0.699
	CONTROL	64	1.766	1.187	1.462	2.12		

Table A2: ESG Pay and Tobin's Q – OLS Outcome Regressions

This table displays OLS regressions of ESG-linked pay on outcome variables. All right-hand side variables are lagged. Intercept, year, country and industry indicators based on the Fama-French 17 classification included in the regressions but not reported. Standard errors are clustered by firm. *t*-statistics are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	(1) Tobin's Q_t	(2) Tobin's Q_t	(3) Tobin's Q_{t+1}	(4) Tobin's Q_{t+1}
ESGPAY$_{t-1}$	0.062*	0.047	0.119***	0.063
	(1.75)	(1.31)	(3.00)	(1.58)
Firm size $_{t-1}$	-0.189***	-0.201***	-0.206***	-0.227***
	(-16.03)	(-16.36)	(-15.55)	(-16.31)
Book-to-market $_{t-1}$	-0.906***	-0.883***	-0.857***	-0.819***
	(-28.46)	(-26.92)	(-26.10)	(-24.40)
Leverage $_{t-1}$	-0.013***	-0.013***	-0.012***	-0.012***
	(-14.91)	(-15.04)	(-13.62)	(-13.74)
ROA $_{t-1}$	0.037***	0.037***	0.033***	0.033***
	(8.23)	(8.27)	(6.97)	(6.99)
Industry fixed effects	Yes	Yes	Yes	Yes
Country fixed effects		Yes		Yes
Year fixed effects	Yes	Yes	Yes	Yes
Observations	21,767	21,767	21,764	21,764
Adjusted R^2	0.628	0.637	0.580	0.594

Table A3: ESG Pay and Tobin's Q - Difference-in-Differences Analysis

This table reports results from difference-in-differences regressions that estimate the effect of ESG pay adoption on Tobin's Q based on a panel dataset. For each treatment firm and its matched control firm we include five annual observations centered around the event year (i.e., the year of ESG pay adoption)—event window [-2, +2]. We estimate the following panel regression equation:

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 Treat_i \times I_{(Year>EventYear)\ i,t} + \beta_2 Treat_i + \beta_3 I_{(Year>EventYear)\ i,t} + \sigma_t + X_{i,t-1}\gamma + \varepsilon_{it}$$

where $TobQ_{i,t}$ is Tobin's Q for firm *i* and year *t*. $Treat_i$ equals one if firm i is a treated firm that first adopts ESG pay after the EU directive was enacted in 2014 and zero if firm i is a matched control firm (from the pool of U.S. firms with no EU subsidiary never adopting ESG pay between year 2011 and 2018). In column 1-2, $I_{(Year>EventYear)\ i,t}$ is equal to one if year t is the after the ESG adoption year for each treatment event (i.e., if event year falls in [+1, +2]) zero otherwise. In column 4-6, we replace this indicator variable with $I_{(Year\geq EventYear)\ i,t}$ which is equal to one if year t is the same as or after the ESG adoption year for each treatment event (i.e., if event year falls in [0, +2]) zero otherwise. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year). Columns 1 and 4 report the coefficients from regressions with no fixed effects; Columns 2 and 5 are based on regressions controlling for industry FE and year FE; regressions reported in Columns 3 and 6 control for an additional switch-on-year FE. Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1) Tobin's Q	(2) Tobin's Q	(3) Tobin's Q	(4) Tobin's Q	(5) Tobin's Q	(6) Tobin's Q
Treat × $I_{(Year \geq EventYear)}$	-0.033	-0.034	-0.036			
	(-0.35)	(-0.36)	(-0.38)			
$I_{(Year \geq EventYear)}$	0.112	0.027	-0.044			
	(1.62)	(0.24)	(-0.43)			
Treat × $I_{(Year \geq EventYear)}$				0.060	0.055	0.056
				(0.60)	(0.56)	(0.57)
$I_{(Year \geq EventYear)}$				0.060	0.025	-0.033
				(0.90)	(0.24)	(-0.36)
Treat	0.100	0.114	0.132	0.052	0.069	0.085
	(0.84)	(1.01)	(1.12)	(0.46)	(0.65)	(0.76)
Firm size $_{t-1}$	-0.052	-0.062	-0.075	-0.052	-0.063	-0.075
	(-1.51)	(-1.42)	(-1.50)	(-1.51)	(-1.43)	(-1.50)
ROA $_{t-1}$	0.000	-0.002	-0.002	0.001	-0.002	-0.002
	(0.03)	(-0.17)	(-0.17)	(0.04)	(-0.15)	(-0.16)
Leverage $_{t-1}$	-0.017***	-0.015***	-0.014***	-0.017***	-0.015***	-0.014***
	(-3.84)	(-3.53)	(-3.56)	(-3.83)	(-3.50)	(-3.56)
Book-to-market $_{t-1}$	-1.062***	-1.002***	-0.984***	-1.060***	-1.001***	-0.983***
	(-7.63)	(-7.72)	(-8.08)	(-7.63)	(-7.69)	(-8.05)
Constant	2.448***	2.699***	3.028***	2.457***	2.728***	3.032***
	(3.03)	(2.80)	(2.75)	(3.05)	(2.81)	(2.76)
Observations	637	637	637	637	637	637
Adjusted R-squared	0.560	0.630	0.637	0.560	0.631	0.637
Industry FE	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes
SwitchOnYear FE	No	No	Yes	No	No	Yes

Table A4: ESG Pay and Tobin's Q – Panel regressions (2012-2020)

This table reports results from panel regressions of Tobin's Q on ESG pay adoption for a sample that includes two types of firms: i) U.S. firms with EU subsidiaries that first adopted ESG pay after 2014 (this is identical to the treatment firms used for Diff-in-Diff analysis); and ii) U.S. firms with no EU subsidiaries that never adopted ESG pay between 2011 and 2018. For each firm our sample includes all the annual observations falling between year 2012 and 2020 for which the ESG pay adoption data (lagged by one year) is available. We estimate the following panel regression equation:

$$TobQ_{i,t}(TobQ_{i,t+1}) = \beta_0 + \beta_1 ESGPAY_{i,t-1} + X_{i,t-1}\gamma + \sigma_t\ (+\eta_i) + \varepsilon_{it}$$

where $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. This indicator is equivalent to the as it identifies the same set of firms. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1) TobQ	(2) TobQ	(3) TobQ(t+1)	(4) TobQ(t+1)
ESGPAY$_{t-1}$	0.30***	0.10	0.36**	0.18**
	(2.60)	(1.29)	(2.48)	(2.09)
Firm size $_{t-1}$	-0.16***	-0.44***	-0.16***	-0.34***
	(-6.71)	(-4.19)	(-5.96)	(-3.48)
ROA $_{t-1}$	-1.11***	-0.45***	-0.99***	-0.08
	(-16.19)	(-5.68)	(-9.45)	(-0.95)
Leverage $_{t-1}$	-0.01***	-0.00	-0.01***	0.00
	(-5.71)	(-0.60)	(-4.73)	(0.05)
Book-to-market $_{t-1}$	-0.00	0.01	0.00	-0.00
	(-0.15)	(1.51)	(0.20)	(-0.24)
Constant	4.57***	10.86***	4.67***	9.03***
	(9.28)	(4.94)	(8.31)	(4.43)
Observations	6059	6057	5292	5290
Adjusted R-squared	0.453	0.628	0.289	0.537
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	-	Yes	-
Firm FE	No	Yes	No	Yes

Table A5: ESG Pay and OPM - OLS Analysis (US firms)

This table reports results from OLS regressions of OPM on ESG pay adoption for the full sample of U.S. firms with ESG pay data coverage from Bloomberg. $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. All the control variables are lagged by one fiscal year, including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
	OPM_t	OPM_t	OPM_t	OPM_{t+1}	OPM_{t+1}	OPM_{t+1}
ESGPAY $_{t-1}$	-2.43***	-0.45	-1.21*	-2.90***	-0.19	-1.62**
	(-3.16)	(-0.56)	(-1.90)	(-3.48)	(-0.22)	(-2.35)
Firm size $_{t-1}$	2.79***	2.02***	0.74	2.79***	2.03***	-0.02
	(16.43)	(11.80)	(1.32)	(15.79)	(11.46)	(-0.03)
Book-to-market $_{t-1}$	1.63***	-1.03***	-4.38***	1.95***	-0.90**	-3.10***
	(5.05)	(-2.94)	(-12.48)	(5.87)	(-2.45)	(-7.86)
Leverage $_{t-1}$	0.00	-0.01	-0.10***	-0.00	-0.01	-0.06***
	(0.15)	(-0.46)	(-5.39)	(-0.02)	(-0.71)	(-3.25)
ROA $_{t-1}$	0.90***	0.91***	0.30***	0.82***	0.83***	0.15***
	(31.35)	(31.34)	(8.78)	(26.55)	(26.83)	(4.64)
Constant	-50.81***	-36.45***	-7.24	-49.89***	-35.99***	10.33
	(-14.23)	(-10.09)	(-0.60)	(-13.35)	(-9.58)	(0.81)
Observations	17987	17987	17984	17460	17460	17456
Adjusted R-squared	0.417	0.505	0.781	0.360	0.450	0.749
Year FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	-	No	Yes	-
Firm FE	No	No	Yes	No	No	Yes

Table A6: ESG Pay and ESG Performance - OLS Analysis (US firms)

This table reports results from OLS regressions of ESG ratings on ESG pay adoption for the full sample of U.S. firms with ESG pay data coverage from Bloomberg. $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. All the control variables are lagged by one fiscal year, including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	SOSCORE	SOSCORE	SOSCORE	ENSCORE	ENSCORE	ENSCORE	CGSCORE	CGSCORE	CGSCORE
ESGPAY $_{t-1}$	7.07***	8.34***	-0.16	15.96***	9.86***	-0.67	11.31***	6.51***	0.24
	(5.53)	(7.21)	(-0.18)	(9.07)	(5.84)	(-0.57)	(8.03)	(4.54)	(0.18)
Firm size $_{t-1}$	6.19***	7.07***	3.22***	8.25***	10.20***	4.02***	3.04***	3.90***	2.70***
	(26.14)	(27.65)	(5.47)	(22.75)	(29.49)	(4.77)	(11.11)	(13.42)	(2.89)
Book-to-market $_{t-1}$	-5.84***	-4.35***	-1.13***	-6.02***	-3.93***	-0.28	-0.69	-0.71	-0.34
	(-12.73)	(-9.05)	(-3.56)	(-9.61)	(-6.12)	(-0.73)	(-1.48)	(-1.40)	(-0.67)
Leverage $_{t-1}$	-0.03	-0.00	-0.01	0.04	0.03	-0.07**	0.02	-0.00	-0.03
	(-1.44)	(-0.24)	(-0.38)	(1.31)	(1.20)	(-2.54)	(0.72)	(-0.21)	(-1.11)
ROA $_{t-1}$	0.01	0.00	0.00	0.17***	0.07**	0.00	0.12***	0.12***	-0.01
	(0.42)	(0.06)	(0.19)	(5.47)	(2.30)	(0.16)	(4.22)	(4.08)	(-0.32)
Constant	-100.60***	-119.50***	-29.19**	-166.36***	-206.52***	-60.89***	-19.80***	-38.24***	-8.92
	(-19.47)	(-21.55)	(-2.21)	(-21.61)	(-27.83)	(-3.23)	(-3.33)	(-6.06)	(-0.43)
Observations	11707	11707	11549	11707	11707	11549	11707	11707	11549
Adjusted R-squared	0.292	0.348	0.834	0.327	0.431	0.866	0.103	0.138	0.644
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	-	No	Yes	-	No	Yes	-
Firm FE	No	No	Yes	No	No	Yes	No	No	Yes

Table A7: ESG Pay and Tobin's Q - OLS Analysis (US firms)

This table reports results from OLS regressions of Tobin's Q on ESG pay adoption for the full sample of U.S. firms with ESG pay data coverage from Bloomberg. $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. All the control variables are lagged by one fiscal year, including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
	TobQ	TobQ	TobQ	TobQ(t+1)	TobQ(t+1)	TobQ(t+1)
ESGPAY $_{t-1}$	0.14**	0.18***	0.01	0.15**	0.20***	-0.00
	(2.35)	(2.74)	(0.18)	(2.37)	(2.91)	(-0.03)
Firm size $_{t-1}$	-0.12***	-0.12***	-0.30***	-0.13***	-0.12***	-0.31***
	(-11.52)	(-9.99)	(-5.72)	(-12.33)	(-9.83)	(-7.08)
Book-to-market $_{t-1}$	-1.20***	-1.19***	-0.67***	-1.10***	-1.09***	-0.37***
	(-31.35)	(-27.14)	(-15.08)	(-25.02)	(-22.11)	(-8.52)
Leverage $_{t-1}$	-0.01***	-0.01***	-0.01***	-0.01***	-0.01***	0.00
	(-13.92)	(-13.16)	(-3.14)	(-12.14)	(-11.31)	(0.43)
ROA $_{t-1}$	-0.00	0.00	0.00	0.00	0.00	0.00
	(-0.78)	(0.09)	(1.16)	(0.10)	(0.60)	(1.07)
Constant	3.89***	3.84***	7.93***	4.23***	3.97***	8.47***
	(17.34)	(15.23)	(7.15)	(18.11)	(15.08)	(8.88)
Observations	18115	18115	18112	17580	17580	17577
Adjusted R-squared	0.477	0.498	0.692	0.375	0.398	0.635
Year FE	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	-	No	Yes	-
Firm FE	No	No	Yes	No	No	Yes

Table A8: Full U.S. firm sample panel regressions (2000-2020): OPM

This table reports results from panel regressions of operating performance margin on ESG pay adoption for **the full sample of U.S. firms** (regardless of whether and when ESG pay is adopted by the firm and whether the firm has EU subsidiaries or not) and the period of year 2000 through 2020. For each firm our sample includes all the annual observations for which the ESG pay adoption data (lagged by one year) is available. $ESGPAY_{i,t-1}$ equals one if the executive compensation contract of firm i features ESG pay in year t-1. $Post2014$ is an indicator variable that equals one if year t is after 2014. $EUsub$ is an indicator variable that equals one if the US firm has EU subsidiary. $Post2014AdopterWithEUsub_i$ is a firm-level indicator that equals one if firm i with EU subsidiary first adopted ESG pay after the EU directive was enacted in 2014 and zero if 1) firm i has no EU subsidiary, or 2) firm i first adopted ESG pay prior to year 2014 or never adopted ESG pay during from 2011 through 2019. This indicator is equivalent to the treatment dummy in the Diff-in-Diff regressions as it identifies the same set of firms. $X_{i,t-1}$ represents a vector of control variables (lagged by one fiscal year) including *Firm size* $_{t-1}$, *ROA* $_{t-1}$, *Leverage* $_{t-1}$, and *Book-to-market* $_{t-1}$ (the natural logarithm of B/M ratio). All regression control for firm FE and year FE. Standard errors are clustered by firm and the corresponding t statistics are reported in parentheses. Variables are defined in the Appendix. ***, ** and* indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
	OPM(t)	OPM(t)	OPM(t+1)	OPM(t+1)
ESGPAY$_{t-1}$	0.42	0.41	-0.27	-0.28
	(0.48)	(0.47)	(-0.27)	(-0.28)
ESGPAY$_{t-1}$ X *post2014*	-3.22***	-3.21***	-3.17***	-3.17***
	(-3.35)	(-3.34)	(-2.75)	(-2.74)
ESGPAY$_{t-1}$ X *EUsub*	-0.66	-2.14*	-0.43	-2.14
	(-0.55)	(-1.74)	(-0.32)	(-1.53)
*Post2014*X *EUsub*	-2.27***	-2.25***	-2.17***	-2.15***
	(-4.09)	(-4.06)	(-3.63)	(-3.60)
ESGPAY$_{t-1}$ X P*ost2014* X *EUsub*	2.70**	1.90	2.83*	1.91
	(2.06)	(1.39)	(1.81)	(1.16)
ESGPAY$_{t-1}$ X *Post2014AdopterWithEUsub*		4.54**		5.36***
		(2.53)		(2.87)
Firm size $_{t-1}$	0.58	0.59	-0.17	-0.15
	(1.01)	(1.04)	(-0.28)	(-0.26)
Book-to-market $_{t-1}$	-4.35***	-4.33***	-3.06***	-3.05***
	(-12.33)	(-12.26)	(-7.75)	(-7.69)
Leverage $_{t-1}$	-0.09***	-0.09***	-0.05***	-0.05***
	(-4.91)	(-4.87)	(-2.79)	(-2.75)
ROA $_{t-1}$	0.30***	0.30***	0.15***	0.15***
	(8.80)	(8.78)	(4.66)	(4.64)
Constant	-3.11	-3.41	14.16	13.87
	(-0.25)	(-0.28)	(1.10)	(1.07)
Observations	17984	17984	17456	17456
Adjusted R-squared	0.782	0.782	0.749	0.750
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes