

# **Executive Compensation tied to Environmental, Social and Governance (ESG) targets: Effects on financial performance and ESG performance (U.S and Brazil firms)**

Abstract: This thesis investigates the relationship between ESG incentive based executive compensation and its effect on financial performance and ESG performance of the firm. The panel dataset has observations from 2010 through 2021 with a focus on United States and Brazil. A dummy variable was used to indicate whether the firm uses an ESG based compensation policy. The results of the ordinary least squares fixed-effects regression shows that there is a significant positive relationship with the ESG score for firms that use this policy. Larger firms, with lower leverage, are more likely to implement this incentive. Peer firm behaviour, and board characteristics such as the share of female board members, and independent members are also key drivers that increase the likelihood of using this incentive. The results do not indicate a significant effect of the ESG incentive on the financial performance of the firm. Future research analysing the impact of specific performance indicators would help in understanding to what extent different targets influence the compensation amount.

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# Chapter I

## Introduction

Executive compensation packages are strongly based on the principal-agent theory. This theory highlights how managers have the incentive to exert minimal managerial effort, such that it differs from the level expected to maximise the benefits of the shareholders. This mismatch in the intentions of the management, has brought about changes to the compensation package, with attempts made to try and link compensation to a measurable outcome of managerial effort such as the stock price (Gayle et al., 2018). However, research has highlighted that the increasing use of stock option-based compensation has culminated with the short run manipulation of stock prices (Peng & Röell, 2014). Recently, the market regulator in India (SEBI), exposed around 135 entities involved in manipulating stock prices, and gaining around \$15.36 million through wrongful gains (Reuters, 2023). Such behaviour encourages the market to question the effectiveness of compensation plans.

In the current uncertain economic environment, stock-based compensation plans are not looking too rewarding. U.S firms in the software and technology sector, are looking to cut down on compensation spending, to continue to stay afloat as the fear of recession looms. However, by decreasing compensation, the firm is exposed to the risk of losing out top performers and decreasing the motivation to contribute to company growth (Maurer & Williams-Alvarez, 2023). Given, the current economic uncertainty, an argument emerges in favour of incentive-based compensation schemes. According to Caudill and Porter (2014), during a period of economic downturn, using incentive and variable pay, grants rewards based on current levels of profitability, and productivity. Using incentive-based pay, and rewards based on financial performance will curtail the expectation of consistently receiving the same amount in rewards.

These arguments highlight that drafting the compensation scheme requires a lot of deliberation. Not only does the committee need to satisfy the executives but also the shareholders. The ideal compensation package would be such that it attracts talent and retains existing leaders. The performance metrics included in these packages has also been evolving. Apart from having financial targets, the importance of showing accountability to ESG metrics has increased.

With the effects of climate change being realized around the world, top executives have been called upon to make some real changes. By including ESG criteria as a performance metric, it forces the management to take these goals seriously. A report by Capital Monitor (2022) suggests that around 41 of the 100 largest banks in the world, have chosen to include environmental performance in their remuneration packages. European banks lead this initiative with at least 25 of the 41 banks using the ESG incentive. Across the banks the most popularly used target seems to be reducing emissions. Apart from that, some banks have completely stopped lending to projects with exposure to coal, and some no longer provide insurance for oil and gas exploration. Another target of banks has been to increase lending towards sustainable or green financing (Papadopoulos, 2022).

While the trend set by the banking sector suggests a change is taking place, there are questions over whether executives intrinsically care about these issues. Just like the behavioural concern with stock manipulation, executives might indulge in ‘green washing’ for the sake of meeting the

target. There is recent evidence of such attempts across different industries. Most recently, EU watchdogs in the banking, insurance and securities sectors have confirmed that firms have made misleading claims regarding their sustainability credits. The EU is concerned about these attempts as investors have poured in billions in funds that claim to be improving ESG related outcomes (Jones, 2023).

Criticism of using ESG metrics highlights that financial profits may decrease in the attempt to try and meet certain criteria, which leads to a trade-off between purpose and profit. Despite the ambiguity of ESG targets, and a lack of global standard of reporting, almost 90% of S&P 500 companies published ESG reports in 2022. Complementing this, the investment flows into sustainable funds increased from around \$5 billion in 2018 to around \$70 billion in 2021 (McKinsey, 2022).

The contrasting views surrounding ESG reporting and the benefits of setting ESG related targets, suggests there is much to explore in this field. The trends surrounding sustainable financing, and the increasing use of ESG based compensation, is indicative of how compensation contracts are evolving with time. This makes it interesting to understand what kind of firms are more likely to use such metrics and whether this trend is more pronounced in some industries than others. This paper aims to explore whether including ESG metrics into executive compensation results in improved firm performance, measured by financial returns and changes brought about in impact investing. The research question aimed at answering these questions is as follows:

To what extent does the inclusion of Environmental, Social and Governance (ESG) performance metrics in compensation contracts influence the financial and ESG performance of a firm?

The results suggest that larger firms with high levels of tangibility, are more likely to use the ESG incentive in compensation packages. Having a board with more female members and independent members is also correlated with this decision. Firms that use the ESG incentive are rewarded with increased ESG ratings and contrary to expectations, ESG incentive is negatively correlated with the expenditure towards clean technologies. The effect on executive compensation however remains inconclusive. The remainder of the paper is organised to better explain these results. The next section highlights the literature review of existing research in this field, followed by understanding the data collection and sample construction. This will lead to the presentation and discussion of the results, culminating in a conclusion highlighting the relevance of the results.

## Chapter II

### Literature Review

The existing research presents contrasting views about the economic significance of using the ESG based incentive. Some papers highlight that ESG goals are included as an attempt at greenwashing. With no real measurable outcome, these goals mislead investors about the potential of their investments ((Walker, 2022); (Teichmann et al(2023))).

Research by Walker (2022) highlights that the rationale behind tying compensation to ESG goals is to try and motivate executives to achieve these goals with sincerity. However, these matters could conflict with shareholder value maximization and the equity markets may not reward these efforts with an increase in share price. To evaluate this relationship, the author scans through the proxy statements of firms to pick out firms that address ESG related matters and have explicitly stated that compensation would be based on the extent to which the target is completed. The results however suggest that, due to an insufficient weight attached to such goals, executives remain indifferent towards addressing ESG related concerns. The paper also highlights that meaningful incentives could be developed in firms which have one or two dominating ESG issues. Firms in industries such as energy production are more likely to implement meaningful and measurable ESG targets, given the nature of output produced. The author also highlights that trying to achieve multiple social goals, such as diversity, inclusion, human resource development etc, may not result in a meaningful outcome. Since these goals are difficult to quantify, managers may overlook such targets and focus on profit generating strategies. For these reasons, the paper concludes that ESG goals could be better achieved through other policies and using it as an incentive is not likely to produce the desired impact. While this paper analyses recent data, the focus on only a small number of firms is not appropriate to rule out the effectiveness of ESG incentives. The findings could change with a larger sample and a longer time period.

Unlike the paper by Walker which concluded that social targets may not contribute to a meaningful compensation contract, the research by Maas (2018) aims to explore otherwise. This paper focuses on the specific effect of including social targets in the compensation contract and its influence on the social performance of firms. Corporate social performance (CSP) is clearly defined by categories such as Employee relations, product quality, human rights, diversity etc. The sum of scores across these categories is used as a proxy measure for CSP. Similar to the previously mentioned methodology, Maas also scans through proxy statements filed by companies to extract the performance targets. This research also could not establish any association between CSP targets and CSP performance. The author suggests that setting measurable quantitative social targets, might prove more effective for managers to work towards achieving such targets. On the other hand, just qualitative targets may only serve as a signal to external shareholders, and consumers about the vision of the firm. Qualitative targets may only satisfy capital providers, social investment funds, and activists. Such targets may not produce a quantifiable outcome, which leads to an indeterminate conclusion about the effectiveness of purpose driven compensation targets.

The above-mentioned papers suggest that purpose driven incentives may not be the ideal solution that achieves ESG outcomes. The weight attached to ESG goals may be irrelevant in comparison

to the value attached to a stock-option plan. Executives may not be intrinsically motivated to work towards such goals. However, with an increasing importance being placed on firms to take accountability for the negative externalities of their business practices, these incentives are likely to be included in more effective ways in the compensation package.

The research by Cohen et al (2022) finds a positive outcome from including ESG incentives in the compensation contracts. This research finds that firms operating in highly polluting industries are more likely to include this form of compensation. Another important takeaway being that pressure generated by institutional investors to pursue certain ESG orientated objectives, forces firms to implement a change in the compensation scheme. Their results also highlight that firms using a purpose driven incentive, will be rewarded with a higher ESG rating, which is attractive for seeking future investments and reflects the commitment of the firms towards these goals. The paper by Cohen et al (2022), will serve as a reference paper for the analysis to follow.

While the original sample included multiple European countries, and the United States, this paper will focus on comparing an advanced economy (United States) and a developing economy (Brazil). Emerging economies have been under pressure to address the externalities of growing production activities. However, experts suggest that developed economies are in a better position to invest in measures to achieve ESG goals. Despite any measures taken in emerging economies, it may not be perceived to be at par with the ESG standards of the advanced economies, leaving firms in a disadvantaged position to attain financing (Attali, 2022). By comparing the outcomes of the two economies, it will provide a perspective on the differences between firm fundamentals and board characteristics regarding ESG and executive compensation.

In addition to the tests conducted by Cohen and co-authors, this paper will also aim to explore whether the inclusion of ESG incentives influences the spending on environmental initiatives.

## **Chapter III**

### **Empirical evidence and hypotheses development**

#### **3.1 Global overview of the use of ESG metrics**

Executive compensation incentives have evolved with time. Pay-for-performance has been seen as an effective method of ensuring the objectives of the managers and shareholders are aligned. Research has shown that tying employee's performance to financial incentives, acts as a signal to managers that they are being rewarded for the extra work with extra pay (Ogbonnaya & Nielsen, 2016). However, the time frame of such goals can influence the motivation of the employees. For example, by linking rewards to shareholder returns as a metric, it could motivate executives to focus on the short-term plan as opposed to long-term value creation.

To regulate pay-for-performance models, an SEC ruling enforced that total shareholder return (TSR) be used as a primary pay metric (Williamson, 2023). The change was brought in so that the incentives of the CEO's and shareholders are aligned. However, a survey suggested that only less than 2% of firms used the TSR metric as a long-term incentive. In the short-term, the pressure to deliver high returns may motivate managers to make rash decisions, that manipulates the stock price in the short run, but leaves the firm vulnerable in the long run. The SEC ruling has ensured that companies provide more details into the executive compensation and financial performance of the firm over the previous fiscal years. This also ensures that firms report whether they use any additional financial or non-financial measures (Williamson, 2023). This disclosure will help provide clarity to investors on how diversified the compensation contract is and understand whether the managers have been provided a long-term incentive to contribute to firm growth in a holistic manner.

While these traditional compensation methods such as stock options, cash bonuses are popular, firms are now looking to realign their focus towards improving their social performance (McKinsey, 2022). Compensation programs are now seeking to deliver holistic performance, by going beyond financial targets, and encouraging the use of more socially and environmentally oriented performance metrics (McKinsey, 2022). An increasing number of firms have now revised their policy, to account for their climate footprint. To ensure that this accountability is not just another 'green washing' attempt to satisfy investors, and include in a year-end report, the usage of ESG related metrics in compensation contracts has been on a rise.

As sampled by the Principles for Responsible Investment (PRI) in 2014, specifically in the utility and extractive sectors, around 83% of companies incorporated an ESG issue in the compensation contract. While around 74% of those chose to disclose the specific performance measure, only 28% of the companies disclosed a measurable performance target (Karananou et al., n.d.). A more recent survey published by Mercer (2021), suggested that from a sample of 135 American companies in 2019, across industries, at least 30% reported using ESG metrics in the incentive plans. When the same survey was repeated on 300 S&P 500 companies in 2020, 38% were using at least one ESG metric in their compensation contract.

While the adoption of ESG metrics has been increasing in the US, firms in Europe are leading the way with around 90% of firms in major European markets using ESG metrics as an incentive. A report released by WTW (Schoenthal & Summers, 2023), reveals that around 44% of sampled firms use ESG metrics as a long-term incentive, up from 21% in 2019. It was also observed that at least 45% of firms use a combination of the three pillars of ESG in the contracts. Apart from the compensation committee that drafts the contracts, other factors such as the local governance frameworks, investor and shareholder preferences are important external factors that influence the adoption of such metrics. As highlighted in the WTW report, European remuneration committees insist that compensation should motivate executives to consider the sustainable outcomes of their decisions.

In the Asia-Pacific region as well, countries like Australia, Japan and Singapore are leading the use of this metric. The survey report by WTW (2023), suggests that around 63% of firms in the region implement the ESG incentive, with most using it as a short-term incentive. The use of the ESG incentive does not seem to be popular amongst Latin American firms. According to MSCI provided ESG ratings, as of July 2020, around 14% of firms surveyed in Brazil, received the 'laggard' rating. This implies that those 14% of firms, are lagging their industry peers, with high exposure and failure to tackle ESG related risks (MSCI,2020). Moving forward to 2021, a survey conducted by Sustainalytics, revealed that around 3% of firms in the Latin America region use ESG related compensation. Amongst those 3% of firms, Brazilian firms were revealed to have the lowest rate of ESG-incentive links (Sustainalytics, 2022).

The difference across regions highlights how varied ESG sensitivity is in different countries. This variability reveals that there is a lot more left to uncover in this topic and opens a discussion about the need for a well-defined framework to bring in more consistency regarding ESG incentive reporting. These differences could be due to inconsistent regulatory requirements for ESG disclosure. Apart from policy differences across nations, firm characteristics such as the firm size, profitability and board composition could also influence the decision to use the ESG incentive.

A paper by Birindelli et al. (2018) explores how board characteristics influences ESG performance. The results suggest that a larger board size is positively correlated with better sustainability performance. The paper also explores the role of board gender diversity on ESG performance. Their results suggest that a balanced board contributes to better ESG performance, owing to better communication, and problem-solving. Another paper by Naciti (2019), investigates the role of board independence on a firm's sustainability performance. The results find a negative relationship between the two factors. The existing research into the importance of board characteristics, suggests that there is merit in including these factors as control variables to explore the extent to which the board composition influences the decision to implement the ESG incentive.

The importance of firm characteristics and ESG performance has also been explored. A paper by Drempetic et al. (2019) investigates the effect of firm size on ESG performance. The findings reveal that there is a significant correlation between firm size and ESG performance. The authors argue that larger companies are under more scrutiny regarding their disclosures, which puts them under more pressure to improve their ESG performance. Since this paper has established the importance of firm size, it is also important to include other factors such as leverage, and



tangibility, as control variables. Therefore, there is merit in understanding what firm characteristics make it more likely to use the ESG incentive, and further understand what gives rise to these differences across countries well. The hypothesis below captures how these factors will be tested:

Hypothesis I: Firm characteristics and board composition, affects the likelihood of a firm including ESG performance metric in the compensation contract.

### **3.2 Socially responsible investment**

Impact investment has become increasingly popular. Investment projects are now assessed not only for its profitability but also with an aim to quantify the social impact of it. A report by Morgan Stanley (2023) suggests that in the near future, companies will look to integrate ESG outcomes into mainstream business strategies. With investors also building up pressure on disclosure of information, the report also suggests that firms will need to concentrate on improving their transparency of information. By doing so, firms will be able to prove that their sustainable initiatives were realized and it's not just a green-washing attempt.

However, to execute these sustainable initiatives, the top management must be motivated to invest a sizeable amount of resources towards achieving these goals. Integrating ESG performance metrics into the compensation contract is one way of achieving this. Not only do the executives receive monetary compensation but also build on their character and reputation by seriously considering their social impact.

A study by Flammer (2013), suggests that firms engaged in CSR initiatives, gain a competitive advantage. The paper reveals that firms are rewarded for behaving consciously towards the environment by having increased stock prices, and the opposite for firms that are perceived to be harming the environment. A more recent study by Flammer et al. (2019), reveals that including a CSR incentive in the contract incentivizes managers to reduce emissions. In the observed sample that accounted for a decrease in emissions by 7%-8%. Additionally, the authors observed that the ratio of green patents to total patents increased by 2.8%.

Given this evidence, there is merit in exploring whether the inclusion of ESG metrics results in investments contributing to a social impact. Firms that implement such incentives are likely to receive higher ESG ratings by agencies. Some managers may be satisfied with the signal these ratings provide and some might go beyond to contribute with impact investments. It is also important to understand whether ESG incentives influences the amount of compensation received. If ESG ratings and executive compensation move in the same direction, without a significant social impact it is indicative that this incentive is only contributing to another 'greenwashing' campaign. To try and distinguish the two possible behaviours by the top management, the following hypotheses will be tested:

Hypothesis II: Firms in US and Brazil that include an ESG incentive are more likely to face favourable ESG ratings, and financial returns (ROA) because of it.

Hypothesis III: Firms in US and Brazil that use the ESG incentive, will increase investments in clean technologies aimed at reducing the impact of pollution.

Hypothesis IV: ESG performance incentives are an important determinant of the total amount of executive compensation.

## **Chapter IV: Data**

### **4.1 Sample construction**

To evaluate the relationship between ESG based performance metrics and executive compensation, more recent data is required. All the financial, and ESG related indicators were extracted from the Thomson Reuters Datastream Database. The time period in focus ranges from 2010-2021. The firms were chosen by first filtering out the active publicly listed firms in USA and Brazil. For Brazil, the Sao Paulo exchange was chosen, and for the USA, the NYSE composite list was chosen. The common identifier for firms was chosen to be the ISIN codes. SIC codes are the traditional identifiers for the different industries, however, for Brazil, there was inconsistency and unavailability of information regarding SIC codes. As an alternative, the Refinitiv Business Classification (TRBC), was used to extract the industry groups of the firms. This classification methodology is market based, which categorizes the firms into industries according to the usage of the product, and not the materials used in manufacturing. It is argued that since the performance of the firm is tied to the market it caters to, the classification is also done in a similar manner (Refinitiv, 2020).

Following this, the publicly traded firms were filtered out using the ESG incentive based binary indicator. After doing so, many firms were dropped out because of unavailable information regarding this indicator. The firms that were left behind were either compliant with the indicator, or did not use it, and a third category of unreported information for some financial years for firms that implemented this policy for more recent years of the sample.

To further extract the relevant financial, board related, and ESG related indicators, the ISIN codes of the firms were used that were filtered out in the previous step. Some variables, like ROA, and firm size, had to be created. Since some other variables were not normally distributed, they had to be corrected for by adding 1 and taking the natural logarithm. These variable transformations led to some missing variables being generated. The summary statistics of the variables are presented below, and a panel describing the trends across the two countries, time period and industries is in the Appendix (see tables A1-A3).

## 4.2 Summary Statistics

Table 1: Summary Statistics

Variable	Obs	Mean	Std Dev	Maximum	Minimum	Median
ESG incentive	25,682	0.273	0.446	1.000	0.000	0.000
Board size	17,161	10.037	3.274	138.000	1.000	10.000
Female board members (%)	17,159	18.157	11.939	100.000	0.000	18.180
Independent board members (%)	17,154	72.920	21.203	100.000	0.000	80.000
Clean Investments	3,283	14.312	3.521	26.360	0.000	14.489
CSR audit	6,155	0.697	0.459	1.000	0.000	1.000
ROA	23,570	0.015	0.099	0.154	-0.293	0.029
Peer firms (%)	46,068	0.152	0.131	1.000	0.000	0.120
Executive compensation	14,938	16.631	1.200	26.593	0.000	16.655
Leverage	23,518	0.316	1.863	276.286	0.000	0.263
Tangibility	22,724	0.290	0.286	1.395	-0.013	0.182
Firm size	23,619	15.045	2.231	22.043	0.000	15.023
ESG score	25,733	43.158	20.865	95.990	0.440	39.670

Table 2: Summary statistics for firms in USA & Brazil

Panel A: Summary statistics for USA firms						
Variables	Obs	Mean	Std Dev	Maximum	Minimum	Median
ESG Incentive	24,180	0.279	0.449	1.000	0.000	0.000
Board size	15,659	10.008	3.175	138.000	1.000	10.000
Female board members (%)	15,657	18.997	11.804	100.000	0.000	18.180
Independent board members (%)	15,657	76.376	17.442	100.000	0.000	81.820
Clean investments	2,669	14.491	3.573	26.360	0.000	14.535

CSR audit	5,246	0.684	0.465	1.000	0.000	1.000
ROA	21,713	0.013	0.102	0.154	-0.293	0.029
Peer firms (%)	43,680	0.154	0.138	1	0.000	0.116
Executive compensation	14,589	16.652	1.189	26.593	0.000	16.671
Leverage	21,661	0.314	1.940	276.286	0.000	0.255
Tangibility	20,876	0.295	0.290	1.395	-0.013	0.181
Firm size	21,762	15.005	2.269	22.043	0.000	14.991
ESG score	24,231	42.639	20.736	95.990	0.440	38.890

Panel B: Summary statistics for Brazil firms

Variables	Obs	Mean	Std Dev	Maximum	Minimum	Median
ESG incentive	1,502	0.176	0.381	1.000	0.000	0.000
Board size	1,502	10.343	4.160	28.000	1.000	9.000
Female board members (%)	1,502	9.392	9.576	50.000	0.000	9.090
Independent board members (%)	1,497	36.773	23.202	100.000	0.000	36.360
Clean Investments	614	13.532	3.171	23.059	2.386	14.140
CSR audit	909	0.773	0.419	1.000	0.000	1.000
ROA	1,857	0.039	0.064	0.154	-0.293	0.037
Peer firms (%)	2,388	0.111	0.168	1.000	0.000	0.077
Executive compensation	349	15.736	1.317	21.595	8.779	15.679
Leverage	1,857	0.338	0.183	1.582	0.000	0.335
Tangibility	1,848	0.234	0.226	0.939	0.000	0.190
Firm size	1,857	15.509	1.659	20.130	4.663	15.358
ESG score	1,502	51.535	21.156	92.220	1.070	53.615

The table above contains all the variables used in different regression analyses. ‘Clean Investments’ captures the investments made by firms in technologies that help with purifying and reducing the pollutants released into the atmosphere. This has been log-transformed to follow a normal distribution. The executive compensation variable has also been log-transformed. CSR audit is a dummy variable that indicates whether the CSR reports are verified by an audit committee. Financial indicators such as Leverage, Tangibility have been scaled by Total assets. The ‘Peer firms’ variable captures the share of usage of the ESG incentive, by firms within the same industry, calculated annually.

The ESG incentive, has an average of around 0.273, indicating that 27% of this sample, uses the ESG based compensation policy. The board statistics highlight that the average size of a board is around 10 members. There seem to be a moderate number of females on the boards, with the median indicating around 18%. As suggested by the independent members statistics, on average firms seem to have 73% of independent board members. There is variance observed with the amount of leverage firms in this sample have taken on, ranging from having no debt, to having debt valued almost 3 times the value of assets as indicated by the maximum leverage.

There is a significant variation within the ESG score as well. Within the current sample, the observed median score is around 39. As defined by the Refinitiv methodology, firms in this range, seem to have a satisfactory ESG performance, with a moderate degree of transparency in reporting ESG related material. On the other hand, the sample seems to have firms that have a very high ESG rating, implying excellent performance and a high level of transparency in reporting ESG material. The CSR dummy, has a high average of around 0.69, implying that within the sample, around 69% of firms have their CSR reports audited.

Table 2 captures the summary statistics of the variables in USA and Brazil individually. Regarding the use of the ESG incentive, around 28% of American firms use it, compared to 17.6% of Brazilian firms. The ESG score distribution is interesting. Brazilian firms on average seem to have a higher ESG rating with the average around 51.5, compared to the 42.6 scored on average by American firms. The peer firm behaviour is also significantly different. While around 15.4% of American firms in the same industry use the ESG incentive, only around 11% of firms in Brazil do so.

Table A3 (see appendix) captures the different rates of ESG-incentive adoption across industries. As theory would guide, industries exposed to ESG related risks, display a higher rate of using ESG incentives. Around 70% of firms in the chemical, and oil and gas sector use this policy. Followed by the metals and mining sector. On the other hand, around 30% of firms in the insurance, banking, and pharmaceutical sectors, use this policy. These trends suggests that firms in industries with a lower rate of adoption, have not provided full disclosure on their ESG goals, or these firms are still sceptical about the effectiveness of these policies, and have prioritised other growth strategies.

Graph A1 (see appendix) plots the trend of the median values of Executive compensation over the 11-year time frame. There is no distinct linear trend in the median levels of executive compensation. Compared to the beginning of the decade when the median payout was around \$20 million, from 2016 through 2020, the payout has decreased to around \$15 million. Graph A2 (see appendix) plots the median values of executive compensation with the ESG incentive. This graph also shows no particular linear growth trend. The payout has remained around the \$20 million threshold, with the period between 2012-2014 recording a slight increase.

A common trend observed in both graphs is the spike in median compensation in 2021, compared to the year prior. Median compensation payout recorded an approximate increase by 20% from 2020, while the median compensation with the ESG incentive grew by 17%. This spike could be explained by an increase in rewards in the form of stock performance and cash bonuses (CNBC,2022). The recovering economy, and increased consumer demand, could have contributed to this rise in compensation.

### 4.3 Variables and Methodology

The variables used in this paper can be categorised as ESG related variables, firm financials, and board characteristics.

Under ESG related variables, the variable ESG incentive is of primary focus. It is the dummy variable that indicates whether the firm used an ESG based compensation policy or not. This variable serves as the dependent variable while testing hypothesis I and serves as an independent variable for the other analyses. Apart from this, the CSR audit dummy serves a control variable in some analyses, and clean investments is an important dependent variable to test hypothesis III.

Firm financials are control variables that accounts for the measures of leverage, tangibility, and firm size. Since these factors influence the resource allocation of a firm, these are important control factors. These three factors will be referred to as ‘firm controls’ in the equations to follow.

Board characteristics is defined by the presence of female, independent board members and board size. Board composition heavily influences the decision-making process. Female board members have the capability of pushing through with certain objectives, and on the other hand independent board members will also support certain decisions that build their own reputation. Thereby making these variables critical control variables. These factors will be referred to as ‘board characteristics’ in the equations to follow.

The hypotheses will be tested with a fixed effect model, accounting for country, time, firm, and industry fixed effects. The standard errors will be clustered at the firm-level since the correlation emerges from repeatedly using the same firms.

Country fixed effects: In this sample, the two countries in focus are USA and Brazil. Fixed effects would account for the unobserved differences. Factors such as climate, geographic location, cultural differences are difficult to quantify, yet can influence the outcomes of this study. Other factors such as regulatory frameworks, legislations passed in the two nations regarding remuneration policy, or a revised rule about ESG reporting are difficult to account for, since these are constantly evolving matters. Such aspects are considered when using country fixed effects.

Firm fixed effects: Across firms as well there are some time-invariant factors that can influence the outcomes. The location of the firm’s operations is not likely to change in the short run and can influence their perspective on contributing towards reducing their carbon footprint. The corporate culture that exists within the firm can also determine the sensitivity of the firm towards their ESG performance.

Year-fixed effects: The economic environment does not remain constant. To account for such varying factors, and trends, year-fixed effects is included. Macroeconomic factors such as an economic downturn is an example. During periods of downturn, firms are likely to cut costs by reducing investments on environmental or social initiatives, leading to lower ESG scores. Including year-fixed effects at least partially accounts for the sudden change in trends during this period.

Industry Fixed effects: There are unobserved factors that influence industries as well. Firms in certain industries are probably more prone to taking anti-pollution measures. There is also a possibility of some regulations affecting different industries at different points in time. Such factors are difficult to account for quantitatively, therefore inclusion of industry fixed effects, reduces the bias from such factors.

### **Endogeneity concerns with ESG related variables**

This analysis uses a dummy variable that states whether or not a firm includes an ESG performance-based compensation metric. Reverse causality can contribute to endogeneity. Hypothesis III, aims to investigate whether using this incentive, leads to improved ESG ratings and financial returns as measured by Return on Assets. It could be that if a firm already displays strong ESG performance, they might try to improve this performance by tying compensation to ESG outcomes. Similarly, a strong financial performance, might enable firms to use this incentive, and encourage investments in environmental related practices. Due to this feedback loop, it would be difficult to establish a clear cause-and-effect relationship of the ESG incentive on these varied outcomes. Omitted variable bias also gives rise to endogeneity. In this analysis, the effect of stakeholder influence is not considered due to the lack of adequate information about this factor for Brazilian firms. Stakeholder pressure, from customers, activist groups could influence the company's stance on ESG practices. The analysis to follow includes a lagged variable of the ESG incentive dummy. If a firm has already been using this incentive, it is likely that they would continue to use it. Therefore, by including the lagged variable, it could partially correct for endogeneity.

### **T-test on differences of means**

A two-sample t-test, assuming unequal variance was conducted on certain variables used in the analysis. The variables were chosen to represent the three categories of variables in this analysis ( ESG related, board characteristics, and financial indicators). Table A4 (see appendix) summarizes these results. The p-value is smaller than the significance level of 5% for all the means compared, which implies that there is a significant difference in the mean observations between both countries. This also suggests that the observed difference is not due to random chance.

## Chapter V: Results & Discussion

The following section describes the methods and models used to test out the hypotheses as described above.

### 5.1 Factors that influence the use of the ESG incentive.

The aim of hypothesis I is to understand what kind of firm characteristics are more likely to lead to the adoption of the ESG incentive. Controlling for Country, Firm and Industry fixed effects separately will account for the unobserved factors across entities that can influence the outcomes. The dependent variable in this scenario, is a dummy variable that indicates whether a firm uses ESG related metrics in its compensation contract. The control variables, account for different firm characteristics capturing board characteristics, and financial indicators.

The equation to test hypothesis I is as follows:

$$\begin{aligned} (ESG_{pay(i,t+1)}) &= \alpha + \beta_1 * Firm_{controls\ i,t} + \beta_2 * ROA_{i,t} + \beta_3 * Board_{characteristics\ i,t} + \beta_4 \\ &* Peer\ firm\ i,t + Country_{FE} + Year_{FE} + Firm_{FE}/Industry_{FE} + \varepsilon_{it} \end{aligned}$$

With ‘i’ representing the firm, and ‘t’ the year between 2010-2021. Country, Industry and Firm fixed effects are accounted for separately in models I, II and III respectively.

Table 3 below captures the results of the fixed-effects models.

Table 3: Firm characteristics and the use of ESG Incentive

Independent Variables	Dependent variable: ESG incentive		
	Model I	Model II	Model III
Firm size	0.047* (0.004)	0.062* (0.006)	0.010 (0.011)
Leverage	-0.069* (0.035)	-0.067*** (0.034)	-0.023 (0.035)
Tangibility	0.116* (0.032)	0.170* (0.076)	-0.089 (0.066)
ROA	-0.036 (0.070)	0.042 (0.084)	-0.034 (0.059)
Female board members (%)	0.0034* (0.0006)	0.0032* (0.0008)	0.0014* (0.0005)
Independent board members (%)	0.0042* (0.0004)	0.004* (0.0005)	0.001* (0.0004)
Board size	0.002 (0.002)	0.001 (0.002)	-0.002*** (0.0017)
Peer firms (%)	0.907* (0.059)	0.403* (0.086)	0.801* (0.102)



Country dummy	-0.229*		
	(0.032)		
Constant	-0.736*	-1.03*	-0.075
	(0.079)	(0.118)	(0.178)
Firm FE	No	No	Yes
Industry FE	No	Yes	No
Time FE	Yes	Yes	Yes
Country FE	Yes	No	No
Adjusted R <sup>2</sup>	0.208	0.232	0.142
Obs	16,393	16,393	16,393

Note: Std errors reported in the parentheses. p-value: \*p<0.05; \*\*p<0.01;\*\*\*p<0.1

The results in table 3 suggest that a particular combination of firm characteristics is correlated with the use of the ESG incentive. Firms that have a larger firm size, smaller levels of debt, high tangibility and more female and independent board members are more likely to implement this incentive. Peer pressure is also highly significant with a positive relationship. The variable ‘Peer firms’ captures the difference between the rate of usage in the same industry between USA and Brazil. The positive coefficient would imply that within the same industry the effect of peer pressure is more pronounced for US firms. At a country level, when firm size increases by 1%, the likelihood of implementing the ESG incentive increases by around 0.00047%. When the leverage ratio increases by 1%, the firm is less likely to use the metric by around 0.07%. The composition of the board has a positive and significant impact when controlling for differences across countries, firms, and industries. According to estimates in model III, increasing the female board members by a percentage point, increases the chances of using the ESG metric by around 0.0014%, and this increases to 0.0034% when controlling for country fixed effects. Having independent board members also increases the chances of including the ESG metric, with the largest effect seen when controlling for country fixed effects.

Peer firm behaviour is the most influential factor that increases the likelihood of implementing the incentive. When there is a percentage point change in the other firms in the same industry using this incentive, the new firm is more likely to use this incentive as well by around 0.8%, in the US compared to Brazil as reported by model III estimates. The country dummy that takes a value of one for US firm-year observations has a negative and significant coefficient. This implies that keeping all else constant, an American firm is less likely to use this incentive compared to a Brazilian firm.

The results of this regression highlighted what kind of firms are more likely to tie executive compensation with ESG outcomes. The following regressions look to explore the effect of using this policy on ESG performance and financial returns.

## 5.2 The effect of using ESG incentives on ESG ratings and financial returns (ROA)

To understand whether using ESG incentives influences the ESG performance, the dependent variable for this analysis will be the ESG score. The independent variables for this model remain the same as previously used, apart from Return on Assets.

The equation to test hypothesis II is as follows:

$$\begin{aligned}
 ESG_{score(i,t+1)} = & \alpha + \beta_1 * Esg\_incentive_{i,t} + \beta_2 * Esg\_incentive_{i,t-1} + \beta_3 \\
 & * Firm_{controls}_{i,t} + \beta_4 * Board_{characteristics}_{i,t} + \beta_5 * Peer\ firm_{i,t} \\
 & + Country_{FE} + Year_{FE} + Firm_{FE}/Industry_{FE} + \varepsilon_{it}
 \end{aligned}$$

With ESG incentive referring to the dummy variable that indicates whether a firm uses the ESG performance metric. Country, Industry and Firm fixed effects are accounted for separately across models I-III respectively.

Table 4 below summarizes the results:

Table 4: Effect of ESG incentive on ESG scores

	Dependent variable: ESG ratings		
Independent variables	Model I	Model II	Model III
ESG Incentive	7.213* (0.611)	6.739* (0.585)	3.563* (0.447)
Lagged ESG Incentive	1.338* (0.625)	0.854 (0.605)	-0.571 (0.431)
Leverage	-0.139 (1.417)	-0.784 (1.423)	0.764 (1.246)
Tangibility	3.347* (1.228)	2.841 (1.865)	2.350 (1.246)
Female board members (%)	0.330* (0.0292)	0.281* (0.029)	0.171* (0.017)
Board size	0.556* (0.129)	0.456* (0.110)	0.129* (0.046)
Independent board members (%)	0.0553* (0.0227)	0.0358*** (0.0191)	0.118* (0.015)
Firm size	5.462* (0.214)	6.795* (0.227)	3.782* (0.423)
Peer firms (%)	-9.137* (2.502)	-19.107* (3.491)	2.857 (3.206)
Country dummy	-8.808* (1.618)		
Constant	-49.4* (3.399)	-74.18* (3.895)	-32.00* (6.677)
Firm FE	No	No	Yes
Industry FE	No	Yes	No
Time FE	Yes	Yes	Yes
Country FE	Yes	No	No
Adjusted R <sup>2</sup>	0.449	0.503	0.433
Obs	14,282	14,282	14,282

Note: Std errors reported in the parentheses. p-value: \*p<0.05; \*\*p<0.01; \*\*\*p<0.1

The results above suggest that ESG based compensation has a positive and significant impact on the firms ESG ratings. Across countries, industries and firms, the companies that choose to use this incentive are rewarded with higher ESG scores. There is a minimum difference of at least 3.6 points between firms that choose to use this incentive and those who do not when controlling for differences across firms. The lagged ESG Incentive variable is also significant only at the country-level. Indicating that ESG scores are not heavily correlated with the firm's historical use of the incentive. Apart from this, the board characteristics and firm size is another important factor that influences ESG scores. A combination of having more female board members, independent board members and a larger board size, leads to a higher ESG score. Financial health indicators like leverage and tangibility do not have a significant correlation with ESG scores.

The choices of peer firms exert a negative and significant impact on ESG ratings at the country and industry level. The choices of peer firms are more pronounced for firms in the US compared to Brazil. The more firms that use this incentive as a performance metric allows for more comparison within the same industry while evaluating ESG performance, that is captured by the negative coefficient. The country dummy is negative and significant. Consistent with estimates of ESG scores from Table 2, keeping all else constant, an American firm is likely to receive a lower ESG score compared to its counterpart in Brazil.

To understand the influence on financial returns, Return on Assets will be used to measure financial performance. The equation to test this is as follows:

$$ROA_{(i,t+1)} = \alpha + \beta_1 * Esg\_incentive_{i,t} + \beta_2 * Esg\_incentive_{i,t-1} + \beta_3 * Firm_{controls}_{i,t} + \beta_4 * Board_{characteristics}_{i,t} + Country_{FE} + Year_{FE} + Firm_{FE}/Industry_{FE} + \varepsilon_{it}$$

The results in Table 5 summarize the results.

Table 5: Regression results summarizing the effect on Return on Assets

Dependent variable: Return on Assets			
Independent variables	Model I	Model II	Model III
ESG Incentive	0.0018 (0.002)	0.0007 (0.0024)	-0.0022 (0.002)
Lagged ESG Incentive	-0.003 (0.002)	-0.0008* (0.0025)	-0.001 (0.002)
Leverage	-0.012* (0.004)	-0.048* (0.011)	-0.129* (0.016)
Tangibility	0.004*** (0.002)	-0.017* (0.011)	-0.078* (0.016)
Firm size	0.008* (0.0005)	0.008* (0.001)	0.008* (0.003)
Female board members (%)	0.0004* (0.0007)	-0.0000 (0.0005)	0.000 (0.0003)

Board size	-0.0005* (0.0002)	-0.0008* (0.001)	-0.004 (0.0002)
Independent board members (%)	0.0001* (0.000)	0.00003 (0.000)	0.0002* (0.0001)
Country dummy	-0.010* (0.003)		
Constant	-0.070* (0.009)	-0.056* (0.019)	-0.049 (0.045)
Firm FE	No	No	Yes
Industry FE	No	Yes	No
Time FE	Yes	Yes	Yes
Country FE	Yes	No	No
Adjusted R <sup>2</sup>	0.073	0.287	0.105
Obs	14,273	14,273	14,273

Note: Std errors reported in the parentheses. p-value: \*p<0.05; \*\*p<0.01; \*\*\*p<0.1

The effect of implementing the ESG metric on financial performance is inconclusive. While the coefficients across all models are positive, they are not significant. The results are insufficient to comment about the financial returns for firms that use the ESG incentive. Unlike previous results, board composition does not appear to be significantly correlated to the ROA. Firm size is the other characteristic that has a significant relationship with ROA, although it is of a rather small positive magnitude.

The results above have established how the incentive affects ESG performance, and whether the firms are rewarded with financial returns. This following analysis aims to explore whether this incentive, brings about a change in executive behaviour as well, by understanding the impact on social impact driven investments.

### 5.3 Effect of ESG incentive on investments in clean technologies

The aim of this hypothesis is to understand whether ESG based compensation results in an increase in investments in avenues that contribute to a social impact. This is captured by the dependent variable ‘Clean Investments’ that describes the expenditure related to pollution reducing technologies (see Appendix for variable description), and control variables representing firm and board characteristics. The CSR audit variable is introduced in this analysis, to control for the credibility of the reported value of ‘Clean Investment’.

The equation to test this is as follows:

$$\begin{aligned}
 \text{Clean Investments}_{(i,t+1)} &= \alpha + \beta_1 * \text{Esg\_incentive}_{i,t} + \beta_2 * \text{Esg\_incentive}_{i,t-1} + \beta_3 \\
 &* \text{Firm}_{controls}_{i,t} + \beta_4 * \text{Board}_{characteristics}_{i,t} + \beta_5 * \text{Peer}_{firms}_{i,t} + \beta_6 \\
 &* \text{CSR}_{dummy}_{i,t} + \text{Country}_{FE} + \text{Year}_{FE} + \text{Firm}_{FE} / \text{Industry}_{FE} + \varepsilon_{it}
 \end{aligned}$$

Table 6 captures these results:

Table 6: Regression results summarizing the effect on Clean Investments

Dependent variable: ln (Clean Investments)			
Independent variables	Model I	Model II	Model III
ESG Incentive	-0.631* (0.291)	-0.684* (0.295)	0.106 (0.094)
Lagged ESG Incentive	-0.425 (0.319)	-0.601* (0.266)	-0.011 (0.089)
Leverage	-1.564*** (0.879)	-2.056* (0.743)	1.631* (0.689)
Tangibility	3.565* (0.795)	3.476* (0.954)	-0.179 (0.707)
Firm size	0.498* (0.147)	0.939* (0.116)	0.771* (0.207)
Female board members (%)	-0.057* (0.015)	-0.084* (0.018)	0.003 (0.005)
Board size	0.054*** (0.032)	0.033 (0.036)	-0.003 (0.022)
Independent board members (%)	-0.008 (0.032)	-0.006 (0.005)	-0.0015 (0.003)
Peer firms (%)	1.835 (1.124)	3.054* (0.765)	0.032 (0.977)
CSR audit	1.515* (0.131)	1.097* (0.275)	-0.004 (0.170)
Country dummy	1.176*** (0.602)		
Constant	4.231*** (2.456)	-1.795 (2.084)	3.423 (3.754)
Firm FE	No	No	Yes
Industry FE	No	Yes	No
Time FE	Yes	Yes	Yes
Country FE	Yes	No	No
Adjusted R <sup>2</sup>	0.251	0.408	0.918
Obs	1,850	1,850	1,850

Note: Std errors reported in the parentheses. p-value: \*p<0.05; \*\*p<0.01; \*\*\*p<0.1

The results above suggest that firms that use the ESG related metrics, have a negative relationship with investment towards clean technologies. The coefficient is significant and negative for models I and II. Implementing the incentives decreases the amount of money spent on clean technologies by around 50%. Across the three models' firm size is an important determinant for the amount of money spent toward clean technologies. When controlling for firm fixed effects, if the firm size increases by 1%, the expenditure towards clean technology also increases by 0.77%. Tangibility is

also positively associated with the expenditure on clean investments. In contrast to the previous results, having an increased presence of female board members negatively affects the outcome. Keeping all other factors constant, firms in the US spend more towards clean investments compared to firms in Brazil as indicated by the ‘country dummy’ estimate.

The tables above have summarized the effect of using the ESG metric, on ESG performance, and financial returns, and social impact. The following analysis aims to understand how this influences the amount of executive compensation received as well.

#### 5.4 Effect of ESG incentives on executive compensation

The compensation received by the top management is important with respect to retaining talent, attracting new talent and to encourage decisions are made to maximise shareholder value. The following regression in Table 7 highlights this:

$$\begin{aligned}
 & \text{Executive compensation}_{(i,t+1)} \\
 & = \alpha + \beta_1 * \text{Esg\_incentive}_{i,t} + \beta_2 * \text{Esg\_incentive}_{i,t-1} + \beta_3 \\
 & * \text{Firm\_controls}_{i,t} + \beta_4 * \text{Leverage}_{i,t-1} + \beta_5 \\
 & * \text{Board\_characteristics}_{i,t} + \beta_6 * \text{Board\_characteristics}_{i,t-1} + \beta_7 * \text{CSR\_dummy}_{i,t} \\
 & + \text{Country}_{FE} + \text{Year}_{FE} + \text{Firm}_{FE}/\text{Industry}_{FE} + \varepsilon_{it}
 \end{aligned}$$

Table 7: Regression results summarizing the effect on Executive compensation.

Dependent variable: ln (Executive compensation)			
Independent variables	Model I	Model II	Model III
ESG Incentive	-0.0083 (0.067)	-0.065 (0.071)	-0.0023 (0.045)
Lagged ESG Incentive	-0.0159* (0.065)	-0.109 (0.667)	-0.086 (0.056)
Leverage	0.0029 (0.259)	-0.023 (0.276)	0.086 (0.290)
Lagged leverage	-0.224 (0.257)	-0.147 (0.271)	0.455 (0.301)
Tangibility	-0.352* (0.128)	0.921*** (0.271)	0.096 (0.450)
Female board members (%)	-0.0125* (0.004)	-0.010* (0.004)	0.005*** (0.003)
Lagged Female board members (%)	-0.0119* (0.0034)	-0.0136* (0.004)	-0.007* (0.003)

Board size	0.0159 (0.011)	0.009 (0.114)	0.004 (0.006)
Lagged Board size	-0.0014 (0.008)	0.004 (0.008)	0.009 (0.011)
Independent board members (%)	-0.007*** (0.004)	-0.003 (0.004)	0.0004 (0.003)
Lagged Independent board members	-0.0043 (0.004)	-0.0005 (0.004)	0.005*** (0.003)
Firm size	0.250* (0.032)	0.248* (0.039)	0.242* (0.059)
CSR audit	0.209* (0.071)	0.084 (0.071)	0.0154 (0.039)
Country dummy	2.168* (0.259)		
Constant	12.035* (0.514)	13.33* (0.736)	12.71* (1.15)
Firm FE	No	No	Yes
Industry FE	No	Yes	No
Time FE	Yes	Yes	Yes
Country FE	Yes	No	No
Adjusted R <sup>2</sup>	0.256	0.261	0.787
Obs	3,806	3,806	3,806

Note: Std errors reported in the parentheses. p-value: \*p<0.05;\*\*p<0.01;\*\*\*p<0.1

From the results in table 6, the effect of using ESG incentives on executive compensation is inconclusive. While the magnitude suggests a negative association, the coefficients are not significant. Among the board characteristics, the share of female board members appears to be the only significant factor influencing the executive compensation. The negative sign of the lagged female board members, and the negative trend when measured at present, suggests that when a male board member is replaced by a female member, the compensation amount decreases. At the country level, an increase in the female board members decreases the compensation by around 1.2%. Apart from these factors, firm size positively influences the outcome of compensation. Across all three models, firm size is significant. Model III estimates, that when firm size grows by 1%, the compensation also increases by around 0.24%.

The country dummy is significant and positively associated with the levels of executive compensation. This implies that keeping all else constant, an executive at an American firm receives a higher level of compensation compared to their Brazilian counterpart.

## Discussion

The research into the effect of using ESG related performance metrics on executive compensation is still at its infancy stage. While some papers found there to be an insignificant relationship between the two factors, some papers have found it to be influential especially as a short-term incentive. The results of this sample however suggest a minor relationship between the two factors.

The results section begins with trying to establish the combination of firm characteristics that increase the likelihood of adopting the ESG based performance metric. As reported in Table 3, financial indicators such as firm size, leverage and tangibility have a significant influence on this decision. Larger firms are more likely to be under scrutiny of investors and shareholders alike. With investors changing their behaviour to increase investment in socially responsible sectors, firms are more likely to respond to this by including ESG performance metric in the compensation contracts. Having highly valued tangible assets, implies that these firms have the option of pledging those assets to raise capital. Such firms can confidently push ahead with achieving ESG related goals, with internal financing option. Along this line, firms with higher levels of leverage are less likely to implement this strategy. The executives are already under pressure to deliver on certain targets to clear debt. The additional pressure of ESG goals, may not be appropriate in such firms since it could be overlooked.

Board composition is another factor that is influential in determining whether firms use this incentive. The presence of female board members and independent board members, increases the chances of a firm using the ESG metric. Prior research already suggests that gender diversity of the board of directors has a positive influence on ESG score and contributes towards improving firm sustainability performance (Romano et al., 2020). Independent board members have a reputation behind them. If they encourage sustainable business practices, it also reflects well on their personality. Therefore, a combination of these factors on the board could encourage some changes in the governance of firms.

However, the most influential factor emerged as the peer behaviour of firms in the same industry. When more firms in the same industry adopt this policy, it puts pressure on the firm as well to implement it. While peer pressure is positively associated with using the ESG incentive, peer firm behaviour negatively affects the ESG ratings. As reported in Table 4, the coefficient of peer firm behaviour has a negative and significant relationship with ESG ratings. This could be attributed to the opportunity of comparison to take place. When more firms disclose how they implement the ESG metrics, it allows for comparison to take place amongst firms within the same industry. ESG rating agencies have more information to compare the performance of firms using the ESG incentive. This allows them to distinguish between a green washing attempt and an intrinsic concern to tackle these issues.

While peer firm behaviour could negatively impact ESG ratings, firms that do use the ESG performance metric, benefit from higher ESG scores as compared to firms that do not. This is encouraging from the perspective that having this incentive motivates executives to take more informed decisions, leading to favourable ESG outcomes. Consistent with the previous results,



having more female board members also has a positive influence on ESG ratings. This pattern highlights the importance of improving board gender diversity.

Prior research into the effect of the ESG incentive on executive compensation, has highlighted that this incentive only serves the purpose of improving the corporate image without any real outcomes. To test this, the regression on clean investments was done as reported in Table 6. Contradictory to the expected outcome, firms that use the ESG incentive, spend lesser on clean investments compared to firms that do not use this incentive. The data on clean investment spending had a very high variance, indicating a difference between the priorities of firms. It is possible that firms contributed to other priorities during this time period. They may have focused on improving other social and governance factors. Since there is also a difference between the scale of firm size in the sample, the ability to invest in such technologies could be positively associated with larger firms. Since this is only one aspect of the many possible outcomes, it is insufficient to comment on the impact of using these incentives.

The regression results in Table 7, captures a negative relationship with executive compensation. Although there is no statistical significance, across the three models, there is a negative coefficient. Had there been a positive association between both factors, the green washing argument could be further explored. However, in this sample, the negative association clarifies that executives are not personally benefitting from this incentive, at least in the short-term. It could be implied that the decrease in compensation is reallocated towards other investments and initiatives contributing to a positive ESG rating.

Another incentive to use this policy, would be the financial rewards to the firm. However, this relationship is difficult to comment on given the results reported in Table 5. Due to the lack of statistical significance, there is no value in interpreting the coefficient. There is inconsistency with the sign of the coefficient being positive in models I and II, and negative in model III. It would be very strong to conclude that this negative association dissuades firms from using the incentive. For larger firms, profits may not be the only priority. Research has proven investor preferences to favour impact investments over careless management of resources to produce quick returns.

## Chapter VI: Conclusion

The interest in Environment, Social and Governance (ESG) objectives has increased in the recent past. The global pandemic, and the harsh effects of climate change has forced firms to make changes to their governance protocols. The increase in energy and commodity prices, has increased the importance of alternate energy sources. These events have brought in a wave of consciousness towards implementing sustainable business practices. Investors, and consumers have also been instrumental in influencing these policies, through their shifting preferences for addressing sustainability. Incorporating ESG targets into compensation contracts is one such strategy of trying to motivate executives to have a serious approach towards these issues.

While prior research presented contrasting opinions regarding the effectiveness of this incentive, this research established a significant positive relationship between implementing the ESG metric, and ESG performance of firms. Larger firms with sufficient tangible assets, and smaller credit constraints were more likely to use this incentive. Peer firm behaviour also emerged as an important factor that encourages the use of this incentive. Firms that have implemented the ESG metric have also been rewarded with increased ESG ratings. The effect of this incentive on non-financial goals remains inconclusive. The data shows a large variation in the investments in clean technologies. Therefore, these results are insufficient to strongly disregard a relationship between the ESG incentive, and ESG related expenditures.

The difference between American and Brazilian firms also got highlighted in the regression results. Keeping all else constant, American firms seem to invest more towards clean investments, and on the hand, data reveals that firms in Brazil have a higher ESG rating. The average of the CSR audit dummy variable was also higher for Brazil. Given that the share of firms using this incentive does not differ too much between US and Brazil, it does highlight how ESG related disclosures differs across economies, and how it influences the perception of ESG performance. The reliance on self-reported publications by firms to evaluate ESG performance, reinforces the need of a common global framework. Setting up of a global standard, ensures the same methodology is applied to evaluate ESG performance.

Firms need to improve their transparency regarding non-financial disclosures. Some targets may be vaguely defined, which further makes it difficult to quantify these targets. There is not much known about the weights attached to these goals which would communicate the priorities of the firms to the investors and shareholders. To improve research in this topic, the reporting standard of performance-based incentives must be revised. If reports contained detailed information about the exact key-performance indicators (KPI), and the extent to which it was achieved, it would provide more clarity on how effective an ESG based incentive policy is.

While the results gathered highlight some important policy implications, there are still limitations. The sample itself had overwhelming number of observations for the United States as compared to Brazil, which could already generate a bias in the results. Due to inadequate information about the specific KPI's in the contracts, it is difficult to make reference to the impact different incentives generate. The results could also be tested across more developed and developing countries, to analyse if the results are robust for other countries with similar economic conditions.

Despite these limitations, the results in this paper highlight that there is still a lot left to uncover to get a definitive answer on the relationship between ESG incentives and executive compensation. Future research in this topic, could focus on trying to analyse the impact of specific KPI's on executive compensation. It would also be interesting to carry out a detailed study on the extent to which the KPI's were achieved. This would shed light on the effectiveness of this policy and help in understanding whether these incentives really motivate the management, and possibly accept a trade-off of profit maximising strategies to focus on ESG incentives instead. Lastly, as regulations surrounding ESG disclosure is constantly evolving, the same research repeated after a few years might result in a larger sample of non-missing observations and possibly more significant results.

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## Appendix

### Variable description

Name	Description
<b>CSR sustainability external audit(as defined by Datastream)</b>	<p>Does the company have an external auditor of its CSR/H&amp;S/Sustainability report?</p> <p>In scope are the data on external audit of the company's CSR data or extra financial report is considered</p> <p>Consider an audit in the form of a review done by a university, academic, expert, external panel or a research centre / web-based CSR reports that are externally audited</p> <p>Integrated annual report having external audit statements for its environmental and social data.</p>
<b>ESG Incentive</b>	<p>Does the company have an extra-financial performance-oriented compensation policy? The compensation policy includes remuneration for the CEO, executive director, based on ESG or sustainability factors.</p>
<b>Environmental Expenditures</b>	<p>All environmental investment &amp; expenditures for environmental protection or to prevent, reduce, control environmental aspects, impacts, and hazards. It also includes disposal, treatment, sanitation, and clean-up expenditure.</p>
<b>Board gender diversity</b>	<p>% of female board directors</p>
<b>Board size</b>	<p>Total number of board members</p>
<b>Independent board members</b>	<p>% of independent board members</p>
<b>Return on Assets</b>	<p>Net income scaled by Total assets</p>
<b>Leverage</b>	<p>Total debt scaled by Total assets</p>
<b>Firm size</b>	<p>Natural logarithm of Total assets</p>
<b>Tangibility</b>	<p>PPE scaled by Total assets</p>
<b>ESG Score</b>	<p>Refintiv's ESG score is an overall company score based on the self-reported information in the environmental, social, and corporate governance pillars.</p>
<b>Executive compensation</b>	<p>Total amount of compensation given out to executives as reported by the company</p>
<b>Peer firms (%)</b>	<p>Share of firms that use the ESG incentive. Calculated by finding the total of firms per industry, per year that use this incentive, and then</p>

dividing it by the total number of firms in that industry. This is calculated separately for U.S and Brazil.

**Table A1 : Distribution of firms that use ESG related compensation by year.**

Year	# of firms using ESG incentive	% of firms using ESG incentive
2010	290	8%
2011	352	9%
2012	388	10%
2013	387	10%
2014	372	10%
2015	471	12%
2016	566	15%
2017	681	18%
2018	729	19%
2019	804	21%
2020	892	23%
2021	1081	28%

**Table A2: Distribution of firms that use ESG related compensation by Country.**

Country	Total number of firms	No. of firms using ESG incentive*	Share of firms using the incentive
Brazil	199	64	32%
USA	3640	1202	33%

\*Firms counted that have implemented the ESG performance metric at least once during the time period 2010-2021

**Table A3: Distribution of firms that use ESG related compensation by Industry.**

Industry	Total number of firms	# of firms using ESG incentive	% of firms using ESG incentive
Oil & Gas Related Equipment and Services	80	50	63%
Insurance	105	32	30%
Chemicals	65	47	72%
Food & Tobacco	83	37	45%
Banking Services	381	120	31%
Professional & Commercial Services	134	56	42%
Household Goods	25	9	36%
Investment Banking & Investment Services	83	30	36%
Hotels & Entertainment Services	104	35	34%
Beverages	27	12	44%
Electrical Utilities & IPPs	87	45	52%
Diversified Retail	28	8	29%
Food & Drug Retailing	28	10	36%
Transport Infrastructure	9	1	11%
Paper & Forest Products	11	8	73%
Oil & Gas	96	70	73%
Real Estate Operations	49	10	20%
Healthcare Providers & Services	71	22	31%
Containers & Packaging	25	13	52%
Specialty Retailers	94	21	22%
Passenger Transportation Services	28	12	43%
Personal & Household Products & Services	30	15	50%
Software & IT Services	321	64	20%
Automobiles & Auto Parts	60	22	37%
Metals & Mining	95	58	61%
Machinery, Equipment & Components	142	52	37%
School, College & University	5	2	40%
Multiline Utilities	14	12	86%
Biotechnology & Medical Research	392	34	9%
Pharmaceuticals	119	40	34%
Telecommunications Services	55	21	38%
Aerospace & Defence	41	18	44%
Uranium	3	3	100%

Freight & Logistics Services	53	12	23%
Electronic Equipment & Parts	40	10	25%
Homebuilding & Construction Supplies	55	20	36%
Construction & Engineering	32	18	56%
Communications & Networking	45	16	36%
Healthcare Equipment & Supplies	158	47	30%
Residential & Commercial REITs	183	71	39%
Miscellaneous Educational Service Providers	17	5	29%
Semiconductors & Semiconductor Equipment	77	30	39%
Water & Related Utilities	18	6	33%
Computers, Phones & Household Electronics	28	11	39%
Coal	6	4	67%
Natural Gas Utilities	12	10	83%
Construction Materials	11	8	73%
Textiles & Apparel	33	11	33%
Media & Publishing	80	16	20%
Renewable Energy	26	7	27%
Financial Technology (Fintech) & Infrastructure	16	2	13%
Consumer Goods Conglomerates	6	4	67%
Diversified Industrial Goods			
Wholesalers	1	1	100%
Leisure Products	29	8	28%
Integrated Hardware & Software	3	2	67%
Office Equipment	4	1	25%

Note: Firms counted that have implemented the ESG performance metric at least once during the time period 2010-2021

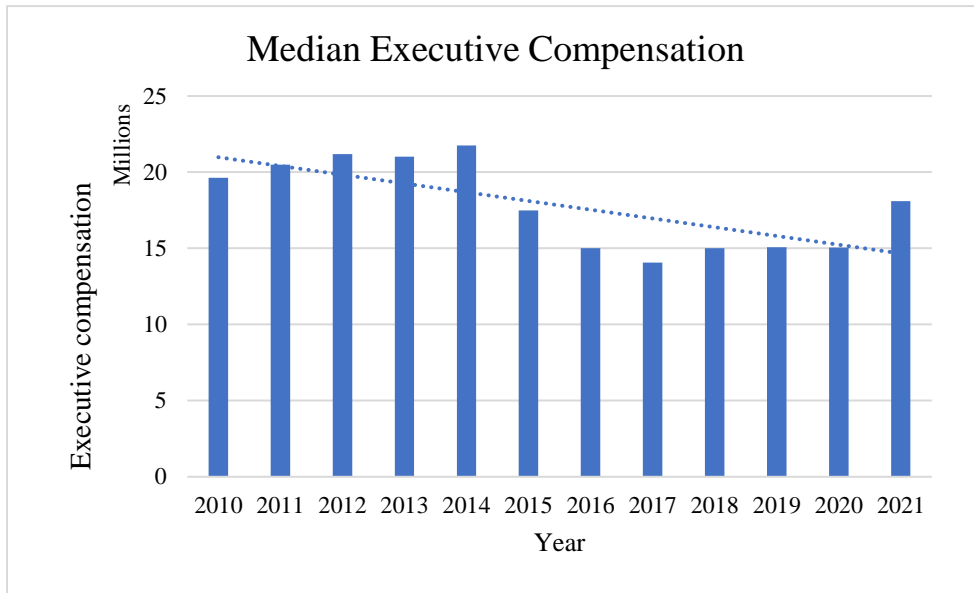
**Table A4: T-test on difference of means**

Variable	t-statistic	P-value ( $H_0: \text{diff}=0$ )
ESG incentive	-10.011	0.000
ESG score	15.83	0.000
Female Board members (%)	-36.317	0.000
Executive compensation	-12.8664	0.000
Clean Investments	-6.591	0.000

Tangibility                      -10.861        0.000

Note: Differences of means was tested assuming unequal variance, and tested by groups. The groups were defined by the dummy variable for the country. Group 0 representing the means for observations from Brazil, and group 1 representing the observations from United States.

Graph 1: Median values of executive compensation from 2010-2021



Graph 2: Median values of executive compensation with the ESG incentive from 2010-2021

