

Agency, Stewardship and Corporate Acquisition Decisions

Jueji Chen

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By: **Jueji Chen**

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Signed by the final examining committee:

_____ Chair
Dr. Mrugank Thakor

_____ Examiner
Dr. Rahul Ravi

_____ Examiner
Dr. Saif Ullah

_____ Supervisor
Dr. Harjeet S. Bhabra

Approved by _____
Chair of Department or Graduate Program Director

Dean of Faculty

Date _____

ABSTRACT

Agency, Stewardship and Corporate Acquisition Decisions

We test whether companies with better ESG performance make poorer merger and acquisition deals because they may limit their choices for targets with similar ESG performance or need to invest more into improving targets' ESG performance, compared to acquirers with poor ESG performance. We also test whether companies with better ESG performance are more likely to pay CEOs lower percentage of equity-based compensation, and are more likely to adopt CEO duality since CEOs tend to be driven by stewardship in companies with better ESG performance. We find that acquiring companies with above-average ESG performance underperform those with below-average ESG performance and the finding is robust to controlling for bidder, target, and deal characteristics; acquiring companies with below-average ESG performance outperform those with above-average ESG performance in the long-term post-acquisition period as well; companies with better ESG performance pay CEOs higher percentage of equity-based compensation and the relation between CEO duality and companies' ESG performance is insignificant and neither is the relation between CEO duality and M&A performance. Overall, our results show that firms with better ESG performance underperform firms with poorer ESG performance during and after M&A events. They also show that CEOs who work for high-ESG companies are not driven by stewardship. Our results imply that firms with good ESG performance do not make value-maximizing merger and acquisition deals nor have CEOs driven by stewardship.

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1. Introduction

CEOs are usually seen as agents for shareholders. According to Ross (1973), agents serve at the interest of principals. However, when the interests of the two parties diverge, agents prioritize their own interests at the expense of the principals. In order to resolve such conflicts of interests, companies deploy mechanisms to better align CEOs' interests with those of shareholders, so they are motivated to serve in the best interest of shareholders.

An alternative theory suggests that agents do not always act as opportunists. On the contrary, they are driven by stewardship and work in the best interest of principals and companies even when conflicts of interest occur. Donaldson and Davis (1991) provide an alternative view of CEOs' roles and their decision making incentives that do not jeopardize shareholders' interests.

Recent literature finds mixed evidence for both agency and stewardship theories. Boyd (1995) suggests that both agency theory and stewardship theory can come into play to explain the relation between CEOs' roles and firm performance. Lam and Lee (2008) find that neither agency theory nor stewardship theory alone could explain the relation between CEOs' roles and firm performance. Rather, it is contingent on other factors, such as family control, (Lam and Lee 2008), board size, (Ramdani and Witteloostuijn 2010) and corporate performance (Elsayed 2007).

CEOs behavioral patterns as agents or stewards can influence companies' stimulus mechanism and structure. If companies believe CEOs behave more like agents, they are more likely to adopt the equity-based compensation that align CEOs interests with those of shareholders, in an attempt to achieve better firm performance. Datta, Iskander-Datta and Raman (2001) document that managers' equity-based compensation (EBC) in acquiring companies is positively associated with stock price performance around and subsequent to acquisition announcements. By the same token, companies which believe CEOs behave more like agents are more likely to avoid CEO

duality structure in order to keep them in check. Jensen and Meckling (1976) state that CEO duality put the independence of governance structure in jeopardy and even contributes to the conflicts of interest. It has also been shown to negatively impact mergers and acquisitions deals. Desai, Krill and Wright (2003) show that companies with CEO duality do not make profitable merger and acquisition deals.

On the other hand, companies that believe CEOs are driven by stewardship are more likely to adopt the opposite measures. Francoeur, Melis, Gaia and Aresu (2017) show that environmentally friendly firms give their CEOs less total compensation and also less incentive-based compensation than firms that have less concern for the environment because CEOs are less enticed by pecuniary rewards but more by environmental protection. This finding is consistent with what is proposed by environmental stewardship theory, which is a stakeholder-enlarged view of stewardship.

Previous literature finds a positive effect of adopting structures and mechanisms conducive under a stewardship framework on firms' performance and mergers and acquisitions. Stewardship suggests that CEO should be given more power that facilitates them to work as a steward, who always place higher value on shareholders and corporation. For example, CEOs who also hold the position of Board Chair can exert greater discretion and have more leeway in directing a firm's strategy. Chaganti, Mahajan and Sharma (1985), Donaldson and Davis (1991) and Finkelstein and D'Aveni (1994) show that CEO duality centralizes leadership, which maximizes shareholders' interest.

However, there is no existing paper investigating the effect of adopting structures and mechanisms under stakeholder-enlarged viewpoint of stewardship on firms' performance and mergers and acquisitions. According to previous literature, CEOs who work for environmentally sensitive companies are driven by stewardship. (Francoeur, Melis, Gaia and Aresu 2017). This suggests that those CEOs care more about the causes such as environmental sustainability than

their personal interests. Environmental stewardship is one of the stakeholder-enlarged views of stewardship. A broader stakeholder-enlarged view of stewardship also includes social responsibilities and governance practices. Accordingly, we expect CEOs who work in companies with better performance in terms of environmental sustainability, social responsibilities, and governance practices to behave more as a steward rather than as an agent of shareholders. In this paper, we argue that firms with better ESG (environmental, social, governance) performance are more likely to pay CEOs lower percentage of equity-based compensation and more likely to adopt CEO duality structure which allows CEOs to implement broad based ESG initiatives as suggested by previous research. To further explore the effect of structures and mechanisms adopted by companies on mergers and acquisitions within the ESG context, we also need to consider the impact of ESG factors on firms' performance. The impact of ESG on M&A performance can be either positive or negative. On the one hand, companies with high ESG performance are more likely to have CEOs who are driven by stewardship. Those CEOs prioritize shareholders interest when it comes to mergers and acquisitions, we expect that companies with high ESG performance have better M&A performance. On the other hand, high-ESG acquirers may underperform compared to low-ESG acquirers. The assumption is based on the fact that companies with better ESG performance may be more likely to acquire targets with similar performance in terms of ESG, or need to make investment to improve targets' ESG performance if it is at a lower level than that of acquirers.

Our sample is comprised of 130 completed US mergers and acquisitions from 2010 to 2016. We extract ESG data for the same period. As a proxy for companies' ESG performance, both overall ESG performance and ESG scores from Sustainalytics are used.

The results are partially consistent with our hypotheses, that high-ESG companies indeed have lower return during the announcement period and lower operating performance during post-

acquisition period. We find that there are some systematic differences among companies with different ESG levels. For instance, companies that have above-average ESG performance tend to have larger firm size and acquire relatively larger targets. According to previous empirical evidence, it is harder for large firms to realize synergies and thus benefit from mergers and acquisitions deals. Moreover, acquiring targets with relatively large size makes acquirers susceptible to suboptimal performance since it raises the level of barrier for integration. These factors likely contribute for high-ESG performers' poorer performance during the announcement period and post-acquisition period. However, the results do not support that high-ESG firms are more likely to pay CEOs lower percentage of equity-based compensation nor that high-ESG firms are more likely to adopt CEO duality. There is no significant association between firm's ESG performance and CEO duality.

A comprehensive test of short-term and long-term performances of acquirers shows that firms with above-average ESG performance experience significantly more negative returns during the announcement period, compared with firms with poorer ESG performance, and it is robust to the methodologies that construct ESG variables and controlling for bidder, target and deal characteristics. Firms with poorer ESG performance also outperform counterparts with above-average ESG performance for one-year post-acquisition period in light of industry-adjusted operating performance. Besides, it also demonstrates that CEO duality has a positive impact on short-term performance, however, the effect is marginal.

Another test of equity-based compensation illustrates that firms with better ESG performance incline to pay CEOs higher percentage of equity-based compensation, and it is robust to controlling for firm characteristics. This finding is contrary to previous research which suggests lower incentive-based compensation for high ESG firms. Overall, our evidence is more consistent with the agency framework and does not support the predictions of stewardship theory.

The rest of the paper is written following the thread: the second part reviews the literature; the third part describes the data; the fourth part presents the methodology; the fifth part exhibits the empirical results; the sixth part concludes.

2. Literature Review

2.1 Impact of ESG on Merger and Acquisition Deals and Firm Performance

According to Song (2016), both the aggregate ESG information and the ESG pillar information of acquirers and targets do not only affect their own market returns but also the combined market returns during mergers around the announcement date. He finds that higher aggregate ESG scores have a positive impact on companies' market returns whereas the relation between the aggregate ESG scores of targets and their market returns is not significant. For ESG pillars, targets' governance scores and acquirers' social scores are priced by the market. According to Bereskin, Frederick, et al. (2017), acquiring companies prefer to choose targets which have similar ESG performance. The similarities generate higher short-term returns during announcement periods and higher long-term returns after mergers and acquisitions. Lu (2014) finds that the market reacts more positively to acquiring firms with CSR ratings than the ones without CSR ratings. Moreover, the deals between acquiring firms with high CSR ratings and acquired firms with low CSR ratings create value in both short run and long run.

When considering ESG, shareholder value maximization expands to stakeholder value maximization during and after mergers and acquisitions. Martirosyan and Vashakmadze (2013) document that deploying a framework of stakeholder management system facilitates to identify the risk of integration and develop communication and engagement strategies. The finding and conclusions are consistent to the previous study, suggesting that less discrepancy results in more synergies and smoother integrations.

Adopting ESG factors when making cross-border mergers and acquisitions seems to be more crucial. Kato (2017) finds that using a sustainable growth strategy that emphasizes on ESG factors help to maintain a stable stock price, possess a larger amount of goodwill and produce profit growth after mergers and acquisitions.

Aside from mergers and acquisitions, ESG factors per se can affect stock performance. Nowadays, more and more individual and institutional investors make responsible investment, which integrates ESG factors into the stock selection and portfolio establishment process. Sherwood and Pollard (2018) find that compared with non-ESG integrated emerging market indices, ESG integrated emerging market indices perform better, which implies that integrating ESG factors into emerging market equities portfolios generates higher return and mitigates downside risk. Friede, Busch and Bassen (2015) show that the positive impact of ESG on corporate financial performance has been stable over time, and some promising results of ESG investing are also obtained from the fields of emerging markets, corporate bonds and green real estate. Waddock and Graves (1997) find that corporate social performance is positively associated with prior financial performance, suggesting a positive relation between slack resource availability and corporate social performance; moreover, corporate social performance is also positively associated with future financial performance, suggesting that corporate social performance is an indicator of good management, which generates superior financial performance for the future. Corporate social performance is different from traditional decision making process and investment strategies. Some scholars suggest to use some new metrics to measure the financial impacts of corporate social performance strategies, instead of commonly used market measures, like share price, and accounting measures, given the facts that they are impacted by factors outside corporate social performance strategies. Pelozo (2009) brings up suggestions in terms of measuring the impacts of corporate social performance investment on financial performance,

under the consideration of the mediation process between corporate social performance and financial performance.

Except studies that examine whether socially responsible investing has material effect on investment performance, other studies explore the non-financial benefits of responsible investing. Richardson (2011) finds that responsible investing allows trustees to invest in the social courses to the interest of beneficiaries. They suggest that relying on the will of beneficiaries is a means of socially responsible investing.

2.2 The Relation between Firms' ESG Performance and CEO Compensation

Several papers find an inverse relationship between CEO compensation and firms' environmental performance. The explanations are not the same. Stanwick and Stanwick (2001) and Coombs and Gilley (2005) discover the negative relationship between CEO compensation and environmental performance. They take a viewpoint of agency theory. They contend that firms behaving better in terms of environmental protection tend to discourage CEOs from doing so. As an alternative argument to agency theory, Francoeur, Melis, Gaia and Aresu (2017) argue that CEOs do not necessarily work as opportunists but rather care about good causes like environmental protection. Under stewardship, CEOs are less incentivized by compensation structure designed according to agency theory, like equity-based compensation. In other words, they are willing to act as stewards for firms and good causes. The paper also explores the impact of institutional context on the relationship between CEO compensation and the environmental performances of companies. It argues that compared with CEOs who have to comply with mandatory environmental regulations, CEOs who voluntarily pursue good environmental performance for the firms accept lower total and equity-based compensation.

There is also compensation designed to promote companies' ESG performance, especially for firms facing policy risks that intend to address environmental and social issues. Haque (2017) finds that ESG-based compensation policy is positively related to carbon reduction initiatives. Velte (2016) finds a positive connection between sustainable management board compensation and ESG performance. However, not every integration of corporate social performance targets into executive compensation can generate ideal results. Maas (2018) finds that the use of corporate social performance targets does not always improve corporate social performance results. The author also notes that in order to improve corporate social performance, it is more effective to use quantitative corporate social performance targets when designing executive compensation. Aside from monetary rewards, CEOs intend to pursue socially responsible strategies for other considerations. Wright and Ferris (1997) find that under political pressure, CEOs divest from certain business units even though the decisions cannot enhance value or raise their personal compensation directly. Sometimes such pressure comes from institutional investors. Starks (2009) finds that institutional investors' views on corporate governance and corporate social responsibility affect CEOs compensation and thus influence managerial decision making and strategies. Borghesi, Houston and Naranjo (2014) find that there is positive relation between the level of media scrutiny around the firm or its CEO and the level of corporate social responsibility investment. It suggests that media attention makes firms prone to make socially responsible investment.

Even from agency theory point of view, adopting ESG and CSR into managerial strategies can benefit CEOs as well as shareholders at the same time. After all, CEOs compensation at least partially depends on their contribution to the companies and adoption of ESG has been proven to improve corporate financial performance. Waddock and Graves (1997) suggest that corporate social performance has a positive relation with companies' financial performance. They argue that

it is necessary for CEOs to consider corporate social responsibility when making decisions since it can lead to better corporate resource allocation.

2.3 Impact of CEO Duality on Firms

There are mixed results related to CEO duality, especially in developed economies. Researchers who find the negative association between CEO duality and firms' performance support agency theory, claiming that CEO duality enhances entrenchment and compromise firms' performance whereas researchers who found the positive association between CEO duality and firms' performance endorse stewardship theory, contending that CEO duality facilitates to exert CEOs' talents and improves firms' performance. Chaganti, Mahajan and Sharma (1985), Donaldson and Davis (1991) and Finkelstein and D'Aveni (1994) find that CEO duality can establish strong, unambiguous leadership, and maximize shareholders' interest under stewardship. Peng, Zhang, and Li (2007) find that during China's institutional transitions, CEO duality patterns highly supported stewardship theory, which means such mechanism is beneficial to firms' performance. Agency theory holds the opposite viewpoint, reckoning that such structure jeopardizes the independence of governance structure and poses a conflict of interest, given that a CEO who is responsible for the overall management of the company also takes charge of evaluating the effectiveness of the decision making and strategies. (Jensen and Meckling, 1976).

When firms have the same individual in those roles, monitoring of CEOs by the board of directors has an important effect on firm's performance. According to agency theory, boards of directors serve as a significant monitoring device, which protects shareholder interests (Fama and Jensen, 1983). Even though boards have significant power on the organizations that they monitor (Dalton, Daily, Ellstrand and Johnson, 1998; Stiles, 2001), research shows that organizational resources can still be used not for the best interest of shareholders (Dalton, Daily, Ellstrand and Johnson, 1998; Donaldson, 1995). Agency theory also suggests that CEO duality gives rise to CEO entrenchment

and impedes boards from effectively monitoring and disciplining (Dalton, Daily, Ellstrand and Johnson, 1998).

Desai, Krill and Wright (2003) test the direct and indirect performance effects of CEO duality. Most importantly, they examine the impact of CEO duality and outside director monitoring on the value creation of mergers and acquisitions. They show that companies with CEO duality do not make profitable deals. It is aligned with agency theory. Most of papers have found the similar results. Hayward and Hambrick (1997) hold that “CEO hubris” explains overpayments for such deals. Another study (Morck, Shleifer and Vishny, 1990) find that acquisitions made by those firms are even no better compared with break-even propositions for acquiring firms. Moreover, managers of target firms are more prone to extract premium above the market price (Bradley, Desai and Kim, 1988). Agency theory argues that mergers and acquisition made by CEOs who have dual roles abuse shareholders’ interest. Amihud and Lev (1981) document that managers prefer exaggerated firm size and diversity even though they are not consistent with profit maximization for shareholders.

Some studies intend to resolve the conflicted results found by previous study. Boyd (1995) suggest that those contradictory results can be resolved by considering both agency and stewardship viewpoints in terms of duality. The author argues that both agency and stewardship theories can come into place when it comes to the relationship between duality and firms’ performance. Lam and Lee (2008) find similar results that neither agency theory nor stewardship alone accounts for the impact of duality on firms’ performance. Rather, the effect of CEO duality on firms’ performance depends on other factors, such as family control. Braun and Sharma (2007) also have similar results that separation of dual role is a way to mitigate the family entrenchment risk in family-controlled public firms. Ramdani and Witteloostuijn (2010) use a quantile regression approach to investigate the relation between CEO duality and firms’ performance and show that

the effect of CEO duality on firms' performance is different across the conditional quantiles of firms' performance distribution and the positive relation between CEO duality and firm performance is weakened when increasing the board size.

The utility of CEO duality is also related to corporate performance itself. Elsayed (2007) finds that CEO duality only affects firms' performance positively given the poor corporate performance.

3. Data

To obtain our sample, first we start from sustainability data. After comparing the quality of data in different databases for sustainability, we finally chose the data from Sustainalytics, which is a database usually used for industrial analysis of equities' ESG performance. We downloaded ESG overall qualitative performance and quantitative performance scores for overall performance as well as environmental, social and governance pillars, respectively. To make it comparable, we also collected data for each company's peer performance since for different industries, the standards to calculate scores are different. Each industry has its own distribution for each pillar and weights allocated to combine scores of each pillar for the total score.

For overall ESG qualitative performance, given the fact that qualitative performance is relatively comparable across different industries, we construct interval variable and also dummy variables for each level of overall performance to capture the effect of overall ESG qualitative performance. There are five levels of overall ESG qualitative performance, which are Laggard, Underperformer, Average Performer, Outperformer, and Leader. For the first method to construct interval variable, we chose Laggard as baseline. In other words, companies which have Laggard ESG overall performance have zero value for this interval variable. Then we assigned the integer values from one to four to underperformer, average performer, outperformer and leader accordingly.

Even though we can see the effect of overall ESG qualitative performance by regressing our dependent variable on the interval variable, it has limitations. It is possible that each level of

overall ESG qualitative performance has its own effect and the effects of different levels are different. To capture the change in each level, we also construct overall ESG qualitative performance dummies. We again use Laggard as baseline and create a dummy variable for each of the other levels. For example, if a company has overall ESG qualitative performance equal to underperformer, then the variable Underperformer equals 1, otherwise 0. We use the same approach to generate values for Average Performer, Outperformer and Leader.

For quantitative scores, we have the data for both aggregate score and scores for each pillar. However, it is not comparable across different industries given the differences existing in distributions and weights. To standardize those scores and make them comparable across different industries, we scale them by their peer group average scores and regress our dependent variable on the ratios. From the univariate analysis, we can see that for both total score ratio and for score ratios for each pillar, they increase as the overall qualitative ESG performance level increases, which suggests our standardization approach is appropriate. From Laggard to Average Performer, the score ratio ranges from 0.7 to 0.9, which means their performance is below peer group average. While from Outperformer to Leader, the score ratio ranges from 1.3 to 1.5, which means they outperform peer group average.

Next we extract data from Securities Data Corporation (SDC) Platinum database for mergers and acquisitions. Our timeframe ranges from January 1, 2011 to December 31, 2016. All our acquirers and targets are public companies in the United States. The deals are completed and deal values are more than one million dollars. We excluded utility and financial firms from our sample since they are highly regulated.

Due to the incompatibility of identifiers for the sample from Sustainalytics and the sample from SDC, we lost a large number of observations. After merging the samples from these two

databases, we ended up having 130 observations that have data for not only sustainability but also mergers and acquisitions.

To construct another two key variables of interest for our study, we obtain data from ExecuComp for CEO equity-based compensation and total compensation and data from Bloomberg for CEO duality. To standardize CEO compensation data for different companies and industries, similar to the approach for ESG data, we scale the amount of equity-based compensation by the total amount of compensation, in order to calculate the ratio for equity-based compensation. We create a dummy variable as a proxy for CEO duality. If a CEO takes dual roles in the company, the variable equals one, otherwise zero.

In order to rule out the noise from other factors and see impacts of variables of interest on mergers and acquisitions, we refer to Masulis, Wang and Xie (2007) and control for bidder characteristics, target and deal characteristics. The details for variable construction can be found in the appendix.

Based on summary statistics, we can see that outperformer and leader are usually larger than companies in the other three lower levels, which partially explains the reason they have lower cumulative abnormal returns and long-term operating performance: it is harder for large companies to realize synergies because they tend to pay higher premium (Roll (1986)). Previous studies have recorded mix results for the effect of Tobin's q on mergers and acquisitions. Moeller, Schlingemann and Stulz (2004) document a negative relation between Tobin's q and acquisition performance. Outperformers have higher Tobin's q compared to companies in the other three levels but the difference is insignificant, so we examine the effect of Tobin's q in the regression analysis as well. According to prevailing evidence, companies with higher growth rates tend to make riskier investments. Such risky investments potentially have a higher likelihood of negatively affecting firm value. We can see that firms with lower ESG ranks have higher leverage ratios,

however, the differences within each level are not significant. Extant research shows firms' leverage has a positive impact on mergers and acquisitions performance because the discipline imposed by debt holders motivates management to make value enhancing decision and generate free cash flows for firms, otherwise they may have to render the company's control to creditors. Since companies with lower ESG ranks have higher leverage ratios, this can also account for better mergers and acquisition performance from companies with lower ESG ranks compared to outperformers.

For target characteristics, we note that underperformers and average performers have larger price run up, which suggests that the market prices those targets as more value enhancing with a greater likelihood that the acquisitions will create value for the combined entity.

For CEO compensation, we can see as ESG level increases, the ratio of equity-based compensation increases as well. In companies with above peer average performance, the equity-based compensation is over 50%, which suggests that companies with higher ESG performance are more likely to pay their CEOs with equity-based compensation.

For deal characteristic, we can see that companies with higher ESG levels incline to make deals with relatively large size. Moeller et al. find a negative relation between relative deal size and mergers and acquisition performance.

4. Methodology

4.1 Event Study Analysis

To conduct short-term performance analysis for announcement period, we use event study to get announcement returns for companies in different ESG levels, and compare announcement returns for companies in different ESG levels. As we can see from table 2, ESG underperformers have significantly positive cumulative abnormal returns from fifty days prior to the announcement date to three days and fifty days after the announcement date. ESG average performers have

significantly positive cumulative abnormal returns from fifty days prior to the announcement date to three days after the announcement date. On the other hand, outperformers have significantly negative cumulative abnormal returns across all event windows except from one day before the announcement date to the announcement date. It suggests that ESG outperformers have poorer announcement period performance compared with companies in lower ESG ranks, such as underperformers and average performers.

We take the period that ranges from two hundred and sixty days before the announcement date to sixty days before the announcement date as the event study estimation period. For event period, we take one day before the announcement date and one day after the announcement date. We also obtain the cumulative abnormal returns for other event windows, (-50, +50), (-50, +3), (-1, 0), (0, +1) and (-2, +2).

To compute the cumulative abnormal returns, we use market-adjusted model as a benchmark. The abnormal return is actual return in excess of CRSP Value-weighted market return. $CAR_{i,t}$ for company i over the period of t is computed as:

$$CAR_{i,t} = \sum R_{i,t} - E(R_{i,t}) \quad (1)$$

Where $R_{i,t}$ is the real return for company i at time t , and $E(R_{i,t})$ is the expected return based on the benchmark model.

4.2 Regression Analysis of Short-Term Performance and Long-Term Performance

As we see from univariate analysis, better ESG performance has a negative impact on announcement returns. To further investigate the relation between ESG performance and short-term return for mergers and acquisitions, we use ordinary least squares (OLS) regression models, adding year dummies and industry dummies as control for year and industry effect.

Since the variables that we construct for ESG include both qualitative and quantitative ones, we build our models for them separately. For overall ESG qualitative performance, we first include ESG interval variable as the only independent variable of interest, called ESG rank (the definition for this variable can be found in the appendix), then regress cumulative abnormal returns on it and other control variables, which include bidder characteristics, target characteristic, as well as deal characteristics. The regression model is written as below:

$$CAR_{i,t} = \alpha + \beta_1 \text{ESG rank}_i + \beta_2 \text{Bidder Characteristics}_{i,t} + \beta_3 \text{Target Characteristic}_{i,t} + \beta_4 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (2)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

Second, we build a regression model by regressing cumulative abnormal returns on ESG dummies that correspond to each overall ESG qualitative performance except the baseline, which is Laggard. Control variables added are the same as the previous regression model. The regression model is written as below:

$$CAR_{i,t} = \alpha + \beta_1 \text{Leader} + \beta_2 \text{Outperformer} + \beta_3 \text{Average Performer} + \beta_4 \text{Underperformer} + \beta_5 \text{Bidder Characteristics}_{i,t} + \beta_6 \text{Target Characteristic}_{i,t} + \beta_7 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (3)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

Lastly, we create another four regression models for quantitative ESG variables. We include total ESG score ratio, environmental score ratio, social score ratio and governance score ratio separately into their regression models as the independent variable of interest, and then regress

cumulative abnormal returns on them and control variables. Those four regression models are listed below:

$$CAR_{i,t} = \alpha + \beta_1 \text{ Total score ratio}_i + \beta_2 \text{ Bidder Characteristics}_{i,t} + \beta_3 \text{ Target Characteristic}_{i,t} + \beta_4 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (4)$$

$$CAR_{i,t} = \alpha + \beta_1 \text{ Environment score ratio}_i + \beta_2 \text{ Bidder Characteristics}_{i,t} + \beta_3 \text{ Target Characteristics}_{i,t} + \beta_4 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (5)$$

$$CAR_{i,t} = \alpha + \beta_1 \text{ Social score ratio}_i + \beta_2 \text{ Bidder Characteristics}_{i,t} + \beta_3 \text{ Target Characteristic}_{i,t} + \beta_4 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (6)$$

$$CAR_{i,t} = \alpha + \beta_1 \text{ Governance score ratio}_i + \beta_2 \text{ Bidder Characteristics}_{i,t} + \beta_3 \text{ Target Charateristics}_{i,t} + \beta_4 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (7)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

After analyzing the effect of ESG on short-term performance, we also study the effect of ESG on long-term post-acquisition operating performance. The dependent variable is industry-adjusted ROA in one year after mergers and acquisitions. ROA is defined as the ratio of EBITDA to total assets. EBITDA is earnings before interest expenses, taxes, depreciation and amortization. To calculate the one-year post-acquisition industry-adjusted ROA, we first obtain the industry average ROAs and subtract industry average ROAs from ROAs for each firm that is in

corresponding industries. The regression models for long-term analysis are the same as the ones for short-term analysis, except that the dependent variable is ROA instead of CAR.

4.3 Regression Analysis of CEO Compensation

As we can see from univariate analysis, companies that have above-average ESG performance also pay their CEOs higher percentage of equity-based compensation. On average, the equity-based compensation accounts for more than 50% of total compensation in those companies. To further explore the relation between CEO compensation and ESG performance, we use equity-based compensation ratio as dependent variable, which equals the amount of equity-based compensation divided by total amount of compensation, and ESG performance as independent variable of interest to construct regression models.

Following the same procedure to create variables for ESG factors in regression analysis for announcement returns, we first build regression models that only include overall ESG qualitative performance. We regress equity-based compensation ratio on ESG rank, which is the main variable of interest, and bidder characteristics as control variables. The regression model is as below:

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{ESG rank}_i + \beta_2 \text{Bidder Characteristics}_{i,t} + \\ & \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (8)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

Then we include ESG dummies for each level of overall ESG qualitative performance as variables of interest and regress the equity-based compensation ratio on these variables as well as bidder characteristics. The regression model is as below:

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{Leader} + \beta_2 \text{Outperformer} + \beta_3 \text{Average} \\ & \text{Performer} + \beta_4 \text{Underperformer} + \beta_5 \text{Bidder Characteristics}_{i,t} + \text{Year fixed effect} + \text{Industry} \\ & \text{fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (9)$$

The other regression models are constructed for quantitative ESG variables, we first regress equity-based compensation ratio on overall score ratio, which is the main variable of interest and control variables, and then add score ratio for each pillar separately as the independent variable of interest into regression model and also control variables. These four regression models are as below:

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{Total score ratio}_i + \beta_2 \text{Bidder} \\ & \text{Characteristics}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (10)$$

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{Environment score ratio}_{i,t} \\ & + \beta_2 \text{Bidder Characteristics}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (11)$$

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{Social score ratio}_{i,t} + \beta_2 \text{Bidder} \\ & \text{Characteristics}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (12)$$

$$\begin{aligned} \text{Equity – based compensation ratio}_{i,t} = & \alpha + \beta_1 \text{Governance score ratio}_i + \beta_2 \text{Bidder} \\ & \text{Characteristics}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \end{aligned} \quad (13)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

4.4 Regression Analysis of Short-Term and Long-Term Performance for CEO Duality

Previous studies have found mixed results for CEO duality. Agency theory suggests that CEO duality has negative impact on merger and acquisition deals whereas stewardship theory argues that CEO duality affects merger and acquisition deals positively. We want to examine the impact of CEO duality on M&A performance in order to see which theory our result is consistent with. In the regression model for short-term analysis, our dependent variable is cumulative abnormal returns around the announcements, and our variable of interest is CEO duality; in the regression model for long-term analysis, the variable of interest is still CEO duality while our dependent variable is one-year post-acquisition operating performance. We control for bidder characteristics, target characteristics and deal characteristics for both regression models.

$$CAR_{i,t} = \alpha + \beta_1 \text{CEO duality}_{i,t} + \beta_2 \text{Bidder Characteristics}_{i,t} + \beta_3 \text{Target Characteristic}_{i,t} + \beta_4 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (14)$$

$$ROA_{i,t} = \alpha + \beta_1 \text{CEO duality}_{i,t} + \beta_2 \text{Bidder Characteristics}_{i,t} + \beta_3 \text{Target Characteristic}_{i,t} + \beta_4 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (15)$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

4.5 Regression Analysis of Short-Term Performance for ESG and CEO Duality

The significantly positive relation between ESG factors and equity-based compensation ratio for CEOs would be in line with the agency theory. However, better ESG performance actually decreases the announcement returns, which means even though the CEOs in companies with higher ESG performance are paid with higher percentage of equity-based compensation, they do not create values for companies. Through testing, there is no significant relation between CEO

duality and CEO equity-based compensation ratio, nor significant relation between CEO duality and companies' ESG performance. We include both CEO duality and ESG factors as variables of interest and regress cumulative abnormal returns on them and other control variables, which are the same as in the regression analysis for short-term performance for ESG, namely, bidder characteristics, target characteristic, and deal characteristics.

First we construct the regression model that takes CEO duality and ESG rank as the main variables of interest, then construct the regression model that includes CEO duality and ESG dummies for each level as the main variables of interest. These two regression models that focus on the effect of CEO duality and overall qualitative ESG performance are written below:

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 \text{ CEO duality}_{i,t} + \beta_2 \text{ ESG rank}_i + \beta_3 \text{ Bidder Characteristics}_{i,t} + \beta_4 \text{ Target} \\
 & \text{Characteristics}_{i,t} + \beta_5 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t}
 \end{aligned}
 \tag{16}$$

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 \text{ CEO duality}_{i,t} + \beta_2 \text{ ESG rank}_i + \beta_3 \text{ CEO duality} * \\
 & \text{ESG rank}_{i,t} + \beta_4 \text{ Bidder Characteristics}_{i,t} + \beta_5 \text{ Target Characteristics}_{i,t} + \\
 & \beta_6 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t}
 \end{aligned}
 \tag{17}$$

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 \text{ CEO duality}_{i,t} + \beta_2 \text{ Leader} + \beta_3 \text{ Outperformer} + \beta_4 \text{ Average Performer} \\
 & \beta_5 \text{ Underperformer} + \beta_6 \text{ Bidder Characteristics}_{i,t} + \beta_7 \text{ Target Characteristic}_{i,t} \\
 & + \beta_8 \text{ Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t}
 \end{aligned}
 \tag{18}$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

Then we construct regression models that only include CEO duality and ESG quantitative variables as main variables of interest, and then regress cumulative abnormal returns on them and the control variables. The regression models for CEO duality and ESG quantitative variables are written as below:

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Total\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
 & \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{19}$$

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Environment\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
 & \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{20}$$

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Social\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
 & \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{21}$$

$$\begin{aligned}
 CAR_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Governance\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
 & \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
 & + \varepsilon_{i,t}
 \end{aligned} \tag{22}$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

4.6 Regression Analysis of Long-Term Performance for ESG and CEO Duality

In order to see the effect of ESG factors and CEO Duality in the long run, we also conduct regression analysis for long-term post-acquisition operating performance. We include both CEO duality and ESG factors as main variables of interest for long-term post-acquisition operating performance analysis, along with other control variables. As before, we construct the regression models for both qualitative and quantitative ESG variables, they are listed as below:

$$ROA_{i,t} = \alpha + \beta_1 \text{CEO duality}_{i,t} + \beta_2 \text{ESG rank}_i + \beta_3 \text{Bidder Characteristics}_{i,t} + \beta_4 \text{Target Characteristics}_{i,t} + \beta_5 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (23)$$

$$ROA_{i,t} = \alpha + \beta_1 \text{CEO duality}_{i,t} + \beta_2 \text{ESG rank}_i + \beta_3 \text{CEO duality} * \text{ESG rank}_{i,t} + \beta_4 \text{Bidder Characteristics}_{i,t} + \beta_5 \text{Target Characteristics}_{i,t} + \beta_6 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (24)$$

$$ROA_{i,t} = \alpha + \beta_1 \text{CEO duality}_{i,t} + \beta_2 \text{Leader} + \beta_3 \text{Outperformer} + \beta_4 \text{Average Performer} + \beta_5 \text{Underperformer} + \beta_6 \text{Bidder Characteristics}_{i,t} + \beta_7 \text{Target Characteristic}_{i,t} + \beta_8 \text{Deal Characteristic}_{i,t} + \text{Year fixed effect} + \text{Industry fixed effect} + \varepsilon_{i,t} \quad (25)$$

$$\begin{aligned}
ROA_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Total\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
& \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
& + \varepsilon_{i,t}
\end{aligned} \tag{26}$$

$$\begin{aligned}
ROA_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Environment\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
& \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
& + \varepsilon_{i,t}
\end{aligned} \tag{27}$$

$$\begin{aligned}
ROA_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Social\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
& \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
& + \varepsilon_{i,t}
\end{aligned} \tag{28}$$

$$\begin{aligned}
ROA_{i,t} = & \alpha + \beta_1 CEO\ duality_{i,t} + \beta_2\ Governance\ score\ ratio_i + \beta_3\ Bidder\ Characteristics_{i,t} + \\
& \beta_4\ Target\ Characteristic_{i,t} + \beta_5\ Deal\ Characteristic_{i,t} + Year\ fixed\ effect + Industry\ fixed\ effect \\
& + \varepsilon_{i,t}
\end{aligned} \tag{29}$$

Where α and β are the coefficients and $\varepsilon_{i,t}$ is the error term.

5. Empirical Results

5.1 Analysis of Short-Term Announcement Returns

First we analyze the effect of firms' ESG performance on stock returns around the announcement dates of mergers and acquisitions. As we can see from table 4, the stock performances of underperformers and average performers are generally better than those of outperformers. The cumulative abnormal returns for underperformers 50 days before the announcement date and 50 days after the announcement date and for 50 days before the announcement date and 3 days

after the announcement date are positively significant, at 5 % and 10 % level, respectively. The cumulative abnormal returns for average performers 50 days before the announcement date and 3 days after the announcement date are also positively significant, at 10 % level. While we observe totally opposite pattern for outperformers, their cumulative abnormal returns are significantly negative for all event windows except 1 day before the announcement date to the announcement date, ranging from -5.62% to -1.66%. The univariate results for event study are consistent with our hypothesis, which claims that low-ESG performers outperform high-ESG performers during the announcement period.

The results for regression analysis of the announcement returns are in line with those of univariate analysis. In table 6, the ESG rank is significantly negative in the first model at 10% level, which suggests that as the ESG ranks increase, the cumulative abnormal returns decrease. In the second model, we have ESG dummy for each level separately. The coefficient parameter for Outperformer is significantly negative at 5% level. For the regression models that include quantitative ESG variables, the coefficient parameter for total ESG score ratio is significantly negative at 5% level and the coefficient parameters for environmental score ratio and social score ratio are both significantly negative at 10% level. In terms of bidder characteristics, Tobin's q, which represent the growth, has significantly positive coefficients at 5% level for all models except model VI. For model VI, it is significant at 10% level. As opposed to what has been found in the previous studies, this indicates that market reacts positively to the mergers and acquisitions decisions made by companies that have high growth or high growth potential, since such deals may help them to further develop. The coefficients for leverage are significantly negative for most models at 5% level and 10% level, except for model II. This is inconsistent with what is suggested by existing literature, which claims that management of companies with more borrowings is cautious about the decisions made in order to capture the benefit of financial leverage and avoid

possible financial distress that renders the risk of losing controls. However, the regression analysis shows that higher leverage ratio decreases cumulative abnormal returns. This suggests that companies have higher leverage make suboptimal decisions. For deal characteristics, tender offer has significantly negative coefficient parameters in all models except the second one, and three out five are significantly negative at 10% level while the other are at 5% level. This shows that tender offer is more likely to generate lower returns around announcement. It is consistent with what is found in existing literature. Deals involved with stock payment have lower returns because it may suggest stocks are overvalued and management uses stocks to pay for the deal in order to benefit from such overpricing. The coefficient for relative deal size is significantly negative at 10% level for the last model, which is consistent with what is suggested by existing literature and univariate analysis, that it is harder to achieve synergies for deals with relatively large size.

In Table 9, where the regression model has CEO duality as main variable of interest, the coefficient of CEO duality is insignificant, which suggests that our result supports neither agency theory nor stewardship theory. Therefore, our results are neither consistent with our hypothesis nor align with existing literature.

In Table 10, after adding CEO duality, we can see that not only the signs of ESG factors do not change, but also their significance is improved slightly. The coefficient parameter for ESG rank becomes significantly negative from 10% level to 5% level. However, in the regression model that contains the interaction term of CEO duality and ESG rank, none of the coefficients of the main variables of interest are significant and neither the coefficient of the interaction term. The coefficient parameter for Outperformer becomes significantly negative from 5% level to 1% level. The coefficient parameter for Total score ratio becomes significantly negative from 5% level to 1% level. The coefficient parameter for Social score ratio becomes significantly negative from 10% level to 5% level. However, adding CEO duality does not help to improve the significance of the

last model, whose main variable of interest is Governance score ratio. It is insignificant with or without CEO duality. Those results are consistent with our hypothesis and what we have found in previous analysis. In terms of the impact of CEO duality on cumulative abnormal returns around the announcement date, it is significantly positive at 10% level in the first two models, which suggests that CEOs who take on dual roles in the company are more likely to make better deals, create values for shareholders and such mechanism benefits shareholders and companies, aligning with stewardship theory rather than agency theory. However, 10% only shows marginal significance, which suggests the pattern of stewardship is not strong. For control variables, the signs remain unchanged while the significance is slightly lower. Tobin's q still has positive effect on the cumulative abnormal returns, nevertheless the coefficient for this variable becomes significantly positive at 10% level in two models. Leverage ratio still has negative impact on cumulative abnormal returns, while the coefficient parameter is significant at 10% level in only two models. Tender offer still has negative impact on the cumulative abnormal returns. Without adding CEO duality, coefficient is insignificant only in one model, while after adding CEO duality, we see the coefficient is significant at 10% level or less in only two models. Deals in which the payment involved stocks still have lower returns, while significance level deteriorates. After adding CEO duality, some coefficients that are significantly negative at 1% level and 5% level become significantly negative at 5% level and 10% level. We see relative deal size becomes insignificant in every model. Those findings do not deviate from what we have found before.

5.2 Analysis of Long-Term Post-Acquisition Performance

Brammer, Brooks and Pavelin (2006) find similar results as we do for our study, that companies with good environmental and social performance have poorer financial performance. To further examine the impact of ESG factors on companies' long-term performance, we analyze the univariate and regression results for one-year post-acquisition operating performance, which is

represented by one-year industry-adjusted ROA. First, in table 5, the univariate analysis shows that companies whose ESG performance is below average (include average) have significantly positive returns, ranging from 2.9% to 5.3%, whereas the long-term post-acquisition operating performance for companies whose ESG performance is above average is not significantly different from zero, which is consistent with the results for short-term analysis, that companies with poorer ESG performance outperform companies with better ESG performance in terms of long-term post-acquisition operating performance. This finding is also consistent with our hypothesis and previous study.

Next, in Table 7, we do the regression analysis for long-term post-acquisition operating performance without adding CEO duality. Compared with short-term performance analysis, the negative magnitude of ESG factors is alleviated. The coefficient for ESG rank is not significant anymore. The coefficient for underperformer is significantly positive at 10% level while none of the rest ESG dummies are significant, which is consistent with the results for univariate analysis that the long-term post-acquisition operating performance of ESG underperformers is better than that of higher ranks, and this is also in line with our hypothesis. The coefficient for Total score ratio is negatively significant at 10% level, which means that companies with lower Total score ratio perform better in the long term, this is consistent with our hypothesis as well. In terms of control variables, the significance for control variables is changed to some extent. The coefficient for firm size becomes significantly positive for all models, at least at 10% level. It suggests that firm size has positive impact on long-term post-acquisition performance, which is consistent with the existing empirical evidence, that larger firms are good at realizing economies of scale. The coefficient on Tobin's q is significantly positive in all models, which suggests that growth rate still has positive impact on long-term post-acquisition operating performance, and companies with higher growth opportunities are more likely to outperform in the long run. Existing literature

provides similar evidence. Leverage ratio becomes insignificant in the long-term post-acquisition analysis, which suggests that leverage ratio does not impact long-term post-acquisition performance significantly. This may suggest probably in the long run, companies can find other sources of funds instead of relying on debts. Free cash flow becomes significant in all models, which suggests that long-term post-acquisition operating performance is positively associated with free cash flow within the firms. This maybe because companies with affluent cash flows have the capacity to make better capital investment and thus grow in the long run. It is in line with what has been found by existing literature. The coefficient for price run up becomes significantly positive in most regress models at 10% level. This maybe because the market has forecasted the good performance after the acquisition and the stock price run up of targets reflects this optimism. The finding is opposite to what has been found by existing literature. None of deal characteristics is significant for the long-term post-acquisition operating performance. That means they only affect the companies' performance around the announcement period but their influence fades away in the long run.

We also add CEO duality into long-term post-acquisition operating performance analysis, see Table 9 and Table 11.

In Table 9, as the short-term analysis for CEO duality, the coefficient of CEO duality is not significant in the model of long-term analysis either. Again, this shows CEO duality does not connect to agency theory nor stewardship theory even in the long run analysis, which is not consistent with existing literature and our hypothesis.

In Table 11, after adding CEO duality, the signs and significance for ESG factors and control variables remain unchanged, except that the coefficient for Total score ratio becomes significantly negative from 10% level to 5% level, the result is consistent with our hypothesis. Nonetheless, the coefficient for CEO duality is insignificant in all regression models, which suggests that CEO duality

does not have significant impact on long-term post-acquisition operating performance either. Just as was the case for short-term analysis, the model that contains interaction term of CEO duality and ESG rank does not have significant coefficients for variables of interest, nor is the interaction term significant, which is not consistent with our hypothesis.

5.3 Analysis of CEO Compensation

CEO compensation is another important factor to be considered when we are studying CEOs' behavioral patterns and their incentives. In Table 6, we find ESG performance actually affects merger and acquisition performance negatively. Previous studies suggests that there is a negative relation between CEO compensation and firms' ESG performance under stewardship. We should further see if there is a negative association between ESG and CEO compensation connected to stewardship, as suggested by previous studies, or agency. Therefore, we conduct an analysis for CEO compensation and firms' ESG performance. In Table 3 and Table 8, both the univariate analysis and regression analysis show that as companies' ESG performance improves, they pay CEOs higher percentage of equity-based compensation, which is opposite to existing literature and our hypothesis. In Table 3, we can see that in companies with ESG performance above average, the percentage for equity-based CEO compensation is above 50% on average whereas for companies with ESG performance below average, the percentage for equity-based CEO compensation is below 50% on average. In Table 8, the regression analysis shows that the coefficient for ESG rank is significantly positive at 1% level, which means as the ESG level increases, the ratio for equity-based compensation increases as well. Regarding ESG dummies, the coefficient for underperformer is significantly positive at 10% level while the significance for coefficients of both average performer and outperformer increases to 1% level. The coefficients for Total score ratio and Environmental score ratio are both significantly positive at 10% level. We add bidder characteristics into the regression model to control for variances of compensation

ratios due to other factors. Among all the bidder characteristics, only the coefficient for Tobin's q is significantly positive for most regression models at 10% level or less, which means that companies with higher growth opportunity are more likely to pay their CEOs with equity-based compensation.

6. Conclusions

In this paper, we conduct an extensive analyses of mergers and acquisitions made by companies with different levels of ESG performances. We investigate the effect of ESG factors and CEOs' behaviors on firms' performance in the announcement period and long-term post-acquisition period, using a sample of 130 completed US merger and acquisition deals from 2011 to 2016.

Our results show the evidence that acquiring firms with above-average ESG performance underperform acquiring firms with below-average ESG performance and this finding is robust to controlling for bidder, target and deal characteristics. Acquiring companies with below-average ESG performance also outperform those with above-average ESG performance in terms of industry-adjusted operating performance for one-year post-acquisition period. The results for CEOs' behaviors show they behave like agents: companies with higher ESG performance tend to pay their CEOs with higher percentage of equity-based compensation. CEO duality does not have a significant influence on M&A performance in the short-run nor in the long-run.

The results for ESG and companies' merger and acquisition performance have several explanations. First, we find that firms with above-average ESG performance have large size and tend to acquire targets that also have large size, which raises the barrier for integration and lowers the synergies. Second, companies with higher ESG performance may tend to acquire targets with similar ESG performance, limiting the range of targets they can choose. Third, after acquiring companies at lower ESG levels, companies with good ESG performance need to invest into targets, aiming at improving targets' ESG performance, which poses a cost for high-ESG acquirers.

The results for ESG and CEOs' behavioral patterns also have several explanations. First, maintaining good ESG performance is becoming more and more important nowadays for regulatory and reputational reasons. Nevertheless, it is not necessary for this to be of CEOs' personal interest. On the contrary, they are expected to be compensated for the effort devoted to maintaining good ESG performance.

In conclusion, the evidence robustly aligns with our hypothesis that high-ESG firms underperform low-ESG firms in the short-run announcement period and also the long-run post-acquisition period and their merger and acquisition deals are not value maximizing. Besides, it shows that CEOs work as agent even within the context of ESG.

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Appendix

Variable Definitions

ESG Qualitative Variables	ESG Rank	0 for Laggard; 1 for Underperformer; 2 for Average Performer; 3 for Outperformer; 4 for Leader
	ESG Dummies	Underperformer: 1 for Underperformer and 0 otherwise; Average Performer: 1 for Average Performer and 0 otherwise; Outperformer: 1 for Outperformer and 0 otherwise; Leader: 1 for Leader and 0 otherwise.
ESG Quantitative Variables	Overall Score Ratio: total ESG score divided by peer group total average score	
	Environment Score Ratio: environmental score divided by peer group environmental average score	
	Social Score Ratio: social score divided by peer group social average score	
	Governance Score Ratio: governance score divided by peer group governance average score	
Bidder and Target Characteristics	Firm Size: logarithm for book value of total assets	
	Tobin's Q: market value of total assets over book value of total assets	
	Leverage: book value of debts over market value of total assets	
	Free Cash Flow: operating income before depreciation minus interest expense minus income taxes minus capital expenditures, scaled by book value of total assets	
	Price run-up (target): CAR for the period (-50, -10) with CRSP value weighted return using market adjusted model	
Deal Characteristics	Tender Offer: 1 for tender offer, 0 otherwise;	
	Stock: 1 for stock payment, 0 otherwise;	
	Diversification: 1 if both acquirer and target are in the same industry, 0 otherwise;	
	Relative Deal Size: transaction value divided by enterprise value of acquirer	
CEO Compensation	Equity-based compensation ratio: total equity-based compensation divided by total compensation	

Table 1 Sample Distribution by Year

This table shows the distribution of the sample by year

Year	2011	2012	2013	2014	2015	2016
Number of observations	23	22	24	15	25	21

Table 2 Sample Distribution by Industry

This table shows the distribution of the sample by industry, defined by Fama-French industry classification. Utilities (FF industry 8) and financial firms (FF industry 11) are excluded from the sample.

Industry	FF 1 Consumer Non- Durables	FF 2 Consumer Durables	FF3 Manufacturing	FF4 Energy	FF5 Chemicals	FF6 Business Equipment	FF7 Telecom	FF9 Shops	FF10 Healthcare
Number of observations	10	1	55	7	6	0	18	26	7

Table 3 Summary Statistics**Panel A**

This table displays descriptive statistics on acquiring firm characteristics, target firm characteristics, CEO compensation, ESG score ratios, deal characteristics, and CEO Duality for companies with different ESG levels. All variables are defined in Appendix A.

	Laggard		Underperformer		Average Performer		Outperformer		Leader	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Bidder Characteristics										
Firm size	9.242	9.323	8.754	8.776	9.663	9.640	10.891	10.875	10.351	10.351
Tobin's q	2.220	1.525	1.795	1.528	1.663	1.516	2.296	2.224	3.819	3.819
Leverage	0.189	0.108	0.159	0.114	0.194	0.165	0.155	0.127	0.060	0.060
Free cash flow	0.074	0.042	0.072	0.047	0.059	0.060	0.088	0.090	0.118	0.118
Target Characteristics										
Price run up	0.035	0.065	0.078	0.049	0.052	0.047	0.043	0.031	-0.102	-0.102
CEO compensation										
Equity-based	0.323	0.320	0.467	0.480	0.562	0.578	0.620	0.661	0.696	0.696
ESG score ratios										
Total score ratio	0.797	0.790	0.769	0.831	0.975	0.977	1.279	1.274	1.347	1.347
Environment ratio	0.743	0.758	0.764	0.717	0.974	0.968	1.343	1.360	1.529	1.529
Social ratio	0.781	0.793	0.794	0.832	0.955	0.965	1.315	1.358	1.471	1.471
Governance ratio	0.875	0.882	0.930	0.896	1.009	1.008	1.127	1.117	0.967	0.967
Deal Characteristics										
Relative deal size	0.700	0.710	0.872	0.871	0.894	0.975	1.089	1.054	1.009	1.009
CEO Duality	3		7		49		10		2	
Observations	7		19		88		14		2	

Panel B

This table reports acquiring firm characteristics, target firm characteristics, CEO compensation, ESG score ratios and deal characteristics for companies with different ESG levels. *, **, *** represent significant levels at 0.10, 0.05, and 0.01, respectively. The sample is separated by average performer.

	below - average	average performer	above - average	difference [below-above]
Bidder Characteristics				
Firm size	8.886	9.663	10.823	-1.938***
Tobin's q	1.910	1.663	2.486	-0.577
Leverage	0.167	0.194	0.143	0.024
Free cash flow	0.073	0.059	0.092	-0.019
Target Characteristics				
Price run up	0.066	0.052	0.025	0.041
CEO compensation				
Equity-based	0.428	0.562	0.630	-0.202***
ESG score ratios				
Total score ratio	0.776	0.975	1.297	-0.511***
Environment ratio	0.758	0.974	1.366	-0.608***
Social ratio	0.791	0.955	1.334	-0.544***
Governance ratio	0.915	1.009	1.107	-0.192***
Deal Characteristics				
Relative deal size	0.825	0.894	1.079	-0.254***
Observations	26	88	16	

Table 4 Event Study Announcement Returns**Panel A**

This table reports the event study CARs around the announcement date for acquiring firms, where the estimation window is 260 trading days ending 60 days before the announcement date. CARs are calculated based on CRSP value weighted returns. *, **, *** represent significant levels at 0.10, 0.05, and 0.01, respectively.

Event window	laggard	underperformer	average performer	outperformer	leader	All
(-50, +50)	8.02%	6.68%**	1.14%	-4.25%**	-1.36%	1.94%
(-50, +3)	0.85%	4.25%*	2.06%*	-3.42%*	-0.44%	1.89%**
(-1, 0)	3.27%	-0.77%	-0.24%	-1.66%	-0.99%	-0.06%
(-1, +1)	2.92%	0.55%	-0.14%	-5.62%***	5.76%	-0.37%
(0, +1)	2.14%	-0.65%	-0.01%	-1.89%**	-1.77%	-0.10%
(-2, +2)	2.53%	-0.21%	0.01%	-3.01%**	-1.75%	-0.10%
Observations	7	19	88	14	2	130

Panel B

This table reports the event study CARs around the announcement date for acquiring firms, where the estimation window is 260 trading days ending 60 days before the announcement date. CARs are calculated based on CRSP value weighted returns. *, **, *** represent significant levels at 0.10, 0.05, and 0.01, respectively. The sample is separated by average performer.

Event window	below - average	average performer	above - average	difference [below-above]
(-50, +50)	7.04%**	1.14%	-3.89%**	10.93%***
(-50, +3)	3.34%	2.06%*	-3.05%*	6.39%**
(-1, 0)	0.32%	-1.66%	-1.58%*	1.90%
(-1, +1)	1.19%	-0.14%	-4.20%**	5.39%**
(0, +1)	0.53%	-0.01%	-2.85%**	3.38%**
(-2, +2)	0.58%	0.01%	-2.85%**	3.43%**
Observations	26	88	16	

Table 5 Univariate Analysis of Long-Term Post-Acquisition Operating Performance

Panel A

This table presents 1-year post-acquisition average ROAs. *, **, *** show significance at 0.10, 0.05, and 0.01, respectively.

	Laggard	Underperformer	Average performer	Outperformer	Leader	All
Industry adjusted ROA	2.90%**	5.28%***	3.67%***	6.77%	6.57%	4.32%***
Observations	7	19	88	14	2	130

Panel B

This table presents 1-year post-acquisition average ROAs. *, **, *** show significance at 0.10, 0.05, and 0.01, respectively.

	Below - average	Average Performer	Above - average	Difference [below-above]
Industry adjusted ROA	4.64%***	3.67%***	6.74%***	-2.10%
Observations	26	88	16	

Table 6 Regression Analysis of Announcement Returns for ESG

The table exhibits the regression analysis of acquirer announcement returns. The dependent variable is acquirer's 3-day CAR_{-1,+1}. In model I, the main variable of interest is acquiring firm's ESG rank. In model II, the main variable of interest is acquiring firm's ESG overall performance dummy. In model III, the main variable of interest is acquiring firm's ESG total score ratio. In model IV, the main variable of interest is acquiring firm's environmental score ratio. In model V, the main variable of interest is acquiring firm's social score ratio. In model VI, the main variable of interest is acquiring firm's governance score ratio.

	I	II	III	IV	V	VI
ESG rank	0.081*					
	(-1.76)					
Underperformer		0.731				
		(-0.34)				
Average performer		0.515				
		(-0.65)				
Outperformer		0.021**				
		(-2.33)				
Leader		0.686				
		(-0.41)				
Total score ratio			0.013**			
			(-2.53)			
Environment score ratio				0.079*		
				(-1.77)		
Social score ratio					0.058*	
					(-1.92)	
Governance score ratio						0.703
						(-0.38)
Bidder characteristics						
Log (total assets)	0.659	0.848	0.870	0.945	0.737	0.299
	(-0.44)	(0.19)	(0.16)	(0.07)	(-0.34)	(-1.04)
Tobin's q	0.043**	0.033**	0.021**	0.013**	0.034**	0.057*

	(2.05)	(2.16)	(2.34)	(2.52)	(2.15)	(1.92)
Leverage	0.091*	0.115	0.051*	0.097*	0.048**	0.086*
	(-1.71)	(-1.59)	(-1.93)	(-1.67)	(-2.00)	(-1.72)
Free cash flow	0.812	0.987	0.879	0.887	0.860	0.888
	(-0.24)	(0.02)	(-0.15)	(0.14)	(-0.18)	(-0.14)
Target characteristics						
Price run up	0.780	0.751	0.892	0.833	0.991	0.677
	(0.28)	(0.32)	(0.16)	(0.21)	(-0.01)	(0.42)
Deal characteristics						
Tender offer	0.057*	0.167	0.046*	0.026**	0.077*	0.036**
	(-1.93)	(-1.39)	(-2.02)	(-2.26)	(-1.78)	(-2.13)
Stock	0.012*	0.011**	0.005***	0.010***	0.013**	0.032**
	(-2.55)	(-2.60)	(-2.86)	(-2.61)	(-2.52)	(-2.17)
Diversification	0.598	0.840	0.798	0.690	0.629	0.604
	(0.53)	(0.20)	(0.26)	(0.40)	(0.48)	(0.52)
Relative deal size	0.200	0.267	0.103	0.109	0.135	0.100*
	(-1.29)	(-1.12)	(-1.64)	(-1.62)	(-1.50)	(-1.66)
<hr/>						
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.107	0.125	0.130	0.107	0.111	0.084
Observations	130	130	130	130	130	130
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Table 7 Regression Analysis of Long-Term Post-Acquisition Operating Performance for ESG

The table exhibits the regression analysis of post-acquisition operating performance. The dependent variable is acquirer's 1-year industry adjusted ROA. In model I, the main variable of interest is acquiring firm's ESG rank. In model II, the main variable of interest is acquiring firm's ESG overall performance dummy. In model III, the main variable of interest is acquiring firm's ESG total score ratio. In model IV, the main variable of interest is acquiring firm's environmental score ratio. In model V, the main variable of interest is acquiring firm's social score ratio. In model VI, the main variable of interest is acquiring firm's governance score ratio.

	I	II	III	IV	V	VI
ESG rank	0.514 (-0.65)					
Underperformer		0.059* (1.91)				
Average performer		0.462 (0.74)				
Outperformer		0.512 (0.66)				
Leader		0.747 (-0.32)				
Total score ratio			0.059* (-1.91)			
Environment score ratio				0.919 (-0.10)		
Social score ratio					0.176 (-1.36)	
Governance score ratio						0.924 (-0.10)
Bidder characteristics						
Log (total assets)	0.022** (2.32)	0.014** (2.49)	0.004*** (2.90)	0.062* (1.89)	0.010*** (2.60)	0.029** (2.20)
Tobin's q	0.012**	0.007***	0.006***	0.025**	0.008***	0.012**

	(2.56)	(2.77)	(2.90)	(2.27)	(2.68)	(2.50)
Leverage	0.515	0.631	0.416	0.503	0.400	0.505
	(-0.65)	(-0.48)	(-0.82)	(-0.67)	(-0.85)	(-0.67)
Free cash flow	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(4.69)	(4.66)	(4.80)	(4.64)	(4.75)	(4.68)
Target characteristics						
Price run up	0.069*	0.105	0.094*	0.064*	0.122	0.061*
	(1.84)	(1.63)	(1.69)	(1.87)	(1.56)	(1.89)
Deal characteristics						
Tender offer	0.339	0.465	0.300	0.387	0.259	0.382
	(0.96)	(0.73)	(1.04)	(0.87)	(1.13)	(0.88)
Stock	0.263	0.195	0.141	0.309	0.229	0.320
	(-1.13)	(-1.30)	(-1.48)	(-1.02)	(-1.21)	(-1.00)
Diversification	0.273	0.229	0.364	0.282	0.281	0.277
	(1.10)	(1.21)	(0.91)	(1.08)	(1.08)	(1.09)
Relative deal size	0.350	0.460	0.381	0.412	0.346	0.414
	(0.94)	(0.74)	(0.88)	(0.82)	(0.95)	(0.82)
<hr/>						
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.328	0.343	0.346	0.326	0.336	0.326
Observations	130	130	130	130	130	130
<hr/>						

Table 8 Regression Analysis for CEO Compensation

The table exhibits the regression analysis of acquirer CEO equity-based compensation ratio. The dependent variable is acquirer's equity-based compensation ratio. In model I, the main variable of interest is acquiring firm's ESG rank. In model II, the main variable of interest is acquiring firm's ESG overall performance dummy. In model III, the main variable of interest is acquiring firm's ESG total score ratio. In model IV, the main variable of interest is acquiring firm's environmental score ratio. In model V, the main variable of interest is acquiring firm's social score ratio. In model VI, the main variable of interest is acquiring firm's governance score ratio.

	I	II	III	IV	V	VI
ESG rank	0.001*** (3.41)					
Underperformer		0.064* (1.87)				
Average performer		0.001*** (3.39)				
Outperformer		0.003*** (3.01)				
Leader		0.089* (1.71)				
Total score ratio			0.090* (1.71)			
Environment score ratio				0.053* (1.96)		
Social score ratio					0.347 (0.94)	
Governance score ratio						0.338 (0.96)
Bidder characteristics						
Log (total assets)	0.982 (-0.02)	0.673 (0.42)	0.727 (0.35)	0.962 (-0.05)	0.408 (2.05)	0.281 (1.08)
Tobin's q	0.079*	0.027**	0.064*	0.290	0.043**	0.034**

	(1.77)	(2.24)	(1.87)	(1.07)	(2.05)	(2.14)
Leverage	0.117	0.135	0.203	0.127	0.204	0.138
	(-1.58)	(-1.51)	(-1.28)	(-1.54)	(-1.28)	(-1.49)
Free cash flow	0.368	0.491	0.461	0.285	0.496	0.487
	(-0.90)	(-0.69)	(-0.74)	(-1.07)	(-0.68)	(-0.70)
<hr/>						
Year fixed	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.127	0.127	0.067	0.074	0.111	0.052
Observations	130	130	130	130	130	130
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Table 9 Announcement Returns and Long-Term Operating Performance Regression Analysis for CEO Duality

The table exhibits the regression analysis of acquirer announcement returns and one-year post-acquisition operating performance for CEO duality. In model I, the dependent variable is acquirer's 3-day CAR_{-1,+1}. In model II, the dependent variable is acquirer's one-year post-acquisition operating performance. In both models, the main independent variable of interest is acquiring firm's CEO duality.

	I	II
Duality	0.295 (1.05)	0.892 (0.14)
Bidder characteristics		
Log (total assets)	0.103 (-1.64)	0.035** (2.14)
Tobin's q	0.628 (0.49)	0.012** (2.54)
Leverage	0.389 (-0.87)	0.536 (-0.62)
Free cash flow	0.611 (0.51)	0.000*** (4.62)
Target characteristics		
Price run up	0.579 (0.56)	0.055* (1.94)
Deal characteristics		
Tender offer	0.085 (-1.74)	0.370 (0.90)
Stock	0.022** (-2.32)	0.306 (-1.03)
Diversification	0.668 (0.43)	0.258 (1.14)
Relative deal size	0.138	0.370

(-1.49)

(0.90)

Year fixed	Yes	Yes
Industry fixed	Yes	Yes
Adjusted R ²	0.044	0.333
Observations	130	130

Table 10 Announcement Returns Regression Analysis for CEO Duality and ESG

The table exhibits the regression analysis of acquirer announcement returns. The dependent variable is acquirer's 3-day CAR_{-1,+1}. In model I, the main variable of interest is acquiring firm's CEO duality and ESG rank. In model II, the main variable of interest is acquiring firm's CEO duality and ESG overall performance dummy. In model III, the main variable of interest is acquiring firm's CEO duality and ESG total score ratio. In model IV, the main variable of interest is acquiring firm's CEO duality and environmental score ratio. In model V, the main variable of interest is acquiring firm's CEO duality and social score ratio. In model VI, the main variable of interest is acquiring firm's CEO duality and governance score ratio.

	I	II	III	IV	V	VI	VII
Duality	0.091*	0.078*	0.101	0.232	0.130	0.275	0.463
	(1.70)	(1.78)	(1.63)	(1.20)	(1.52)	(1.10)	(0.74)
ESG rank	0.025**						0.300
	(-2.27)						(-1.04)
Duality*ESG rank							0.785
							(-0.27)
Underperformer		0.688					
		(-0.40)					
Average performer		0.386					
		(-0.87)					
Outperformer		0.005***					
		(-2.88)					
Leader		0.581					
		(-0.55)					
Total score ratio			0.005***				
			(-2.85)				
Environment score ratio				0.061*			
				(-1.89)			
Social score ratio					0.027**		
					(-2.23)		
Governance score ratio						0.582	
						(-0.55)	

Bidder characteristics

Log (total assets)	0.461 (-0.74)	0.900 (-0.01)	0.994 (0.01)	0.926 (-0.09)	0.599 (-0.53)	0.209 (-1.26)	0.359 (-0.92)
Tobin's q	0.060* (1.94)	0.032** (2.16)	0.016** (2.45)	0.011** (2.60)	0.027** (2.24)	0.051* (1.97)	0.585 (0.55)
Leverage	0.187 (-1.33)	0.222 (-1.23)	0.078* (-1.78)	0.137 (-1.50)	0.067* (-1.85)	0.125 (-1.55)	0.407 (-0.83)
Free cash flow	0.906 (0.12)	0.666 (0.43)	0.792 (0.26)	0.654 (0.45)	0.831 (0.21)	0.879 (0.15)	0.539 (0.62)

Target characteristics

Price run up	0.768 (0.30)	0.710 (1.78)	0.842 (0.20)	0.783 (0.28)	0.997 (0.00)	0.624 (0.49)	0.648 (0.46)
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Deal characteristics

Tender offer	0.109 (-1.62)	0.296 (-1.05)	0.101 (-1.65)	0.047** (-2.01)	0.167 (-1.39)	0.065* (-1.87)	0.156 (-1.43)
Stock	0.05** (-1.95)	0.020** (-2.36)	0.010* (-2.64)	0.018** (-2.39)	0.026** (-2.26)	0.061* (-1.89)	0.012** (-2.54)
Diversification	0.485 (0.70)	0.848 (0.19)	0.839 (0.20)	0.699 (0.39)	0.640 (0.47)	0.599 (0.53)	0.635 (0.48)
Relative deal size	0.200 (-1.29)	0.298 (-1.05)	0.107 (-1.62)	0.113 (-1.60)	0.148 (-1.46)	0.103 (-1.64)	0.270 (-1.11)

Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.103	0.136	0.145	0.113	0.123	0.087	0.141
Observations	130	130	130	130	130	130	130

Table 11 Long-Term Post-Acquisition Operating Performance Regression Analysis for CEO Duality and ESG

The table exhibits the regression analysis of post-acquisition operating performance. The dependent variable is acquirer's 1-year industry adjusted ROA. In model I, the main variable of interest is acquiring firm's CEO duality and ESG rank. In model II, the main variable of interest is acquiring firm's CEO duality and ESG overall performance dummy. In model III, the main variable of interest is acquiring firm's CEO duality and ESG total score ratio. In model IV, the main variable of interest is acquiring firm's CEO duality and environmental score ratio. In model V, the main variable of interest is acquiring firm's CEO duality and social score ratio. In model VI, the main variable of interest is acquiring firm's CEO duality and governance score ratio.

	I	II	III	IV	V	VI	VII
Duality	0.809 (0.24)	0.748 (0.32)	0.585 (0.55)	0.885 (0.14)	0.649 (0.46)	0.879 (0.15)	0.674 (-0.42)
ESG rank	0.482 (-0.71)						0.299 (1.06)
Duality*ESG rank							0.238 (-1.20)
Underperformer		0.059* (1.91)					
Average performer		0.486 (0.70)					
Outperformer		0.544 (0.61)					
Leader		0.715 (-0.37)					
Total score ratio			0.049** (-1.99)				
Environment score ratio				0.906 (-0.12)			
Social score ratio					0.155 (-1.43)		
Governance score ratio						0.896	

							(-0.13)
Bidder characteristics							
Log (total assets)	0.027*	0.017**	0.006***	0.071*	0.013**	0.037**	0.891
	(2.24)	(2.42)	(2.83)	(1.82)	(2.52)	(2.11)	(-0.14)
Tobin's q	0.011**	0.006***	0.005***	0.023**	0.008***	0.013*	0.250
	(2.59)	(2.79)	(2.88)	(2.30)	(2.72)	(2.53)	(-1.17)
Leverage	0.564	0.691	0.479	0.544	0.450	0.548	0.894
	(-0.58)	(-0.40)	(-0.71)	(-0.61)	(-0.76)	(-0.60)	(0.13)
Free cash flow	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.107
	(4.62)	(4.60)	(4.80)	(4.53)	(4.72)	(4.57)	(1.66)
Target characteristics							
Price run up	0.063**	0.097*	0.085*	0.060*	0.115	0.056*	0.641
	(1.87)	(1.67)	(1.74)	(1.90)	(1.59)	(1.93)	(-0.47)
Deal characteristics							
Tender offer	0.317	0.428	0.254	0.373	0.224	0.367	0.276
	(1.01)	(0.80)	(1.15)	(0.89)	(1.22)	(0.90)	(1.11)
Stock	0.267	0.204	0.155	0.306	0.250	0.327	0.697
	(-1.12)	(-1.28)	(-1.43)	(-1.03)	(-1.16)	(-0.98)	(0.39)
Diversification	0.257	0.216	0.354	0.264	0.267	0.258	0.099*
	(1.14)	(1.24)	(0.93)	(1.12)	(1.12)	(1.14)	(1.71)
Relative deal size	0.308	0.413	0.337	0.370	0.302	0.371	0.034**
	(1.02)	(0.82)	(0.96)	(0.90)	(1.04)	(0.90)	(2.22)
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Year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.331	0.346	0.349	0.328	0.339	0.328	0.405
Observations	130	130	130	130	130	130	130
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