



Trading Green

An Inquiry into ESG Scores and The Impact on
Insider Trading Patterns

RBUS4411 Research Project

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1.0 Introduction

Environmental, social, governance ('ESG'), alternatively, corporate social responsibility ('CSR'), are measures and attributes of a company that signifies its adherence to social good through the promotion of sustainable and ethical business practices. The investment into these notions impose additional constraints to insider trading by executives, which is largely a self-serving behaviour and contravenes the notion of good ESG practices.

By design, it is expected that the correlation between ESG-conscious firms and executive insider trading profitability are negatively correlated. Building a positive image as a firm means that executives are more likely to refrain from unethically partaking in informed trading.

ESG as a term is born in modernity with studies relating ESG and insider trading profitability predominantly emanating from the early 21st century¹. In this study, we review multiple recent papers and explore the current status quo of the ESG and insider trading associations.

With an ever-increasing focus on ESG, especially post-pandemic (Matsuo, 2020), we speculate and empirically analyse recent data from Australian ASX-listed equities – intended to be an update and extension to the existing ESG and insider trading research.

1.1 Legislations, Geographies, Social Expectations

While on the surface, the relationship between ESG-conscious firms and insider trading activity is seemingly obvious, several other factors need be considered.

A firm's commitment towards social good assists in building an abstinent, society-caring positive brand (McWilliams et al., 2006; Fombrun et al., 1990), and therefore their ESG, benefits the firm in multiple ways. In addition to the innate benefits of more sustainable processes, there are additional costs on high level personnel (e.g., executives, managers) that engage in informed trading or similarly unethical activities as to oppose the 'do no evil' culture within ESG-conforming firms (Hoi, 2013). The act of informed trading portrays an unfair expropriation of uninformed investors and is generally prohibited by law and considered unethical and greedy (Will, 1987). The negative publicity associated with such act is also detrimental to a firm and executive image – further eliciting a cost with informed trading. It would therefore be expected that a firm's goal of maintaining a positive image is an additional constraint on profitable insider trading by executives (Klein et al., 1981).

Existing literature has also suggested the opposite association. Engagement in ESG practices could serve as an insurance policy against negative events, suggesting that ESG-conscious firms would incur a lesser punishment from insider trading – instigating a potentially positive association (Godfrey et al., 2009; Minor et al., 2012).

Other considerations are the legal system and social expectations revolving around the company domiciles. Differing frameworks (e.g., Common Law, Civil Law) may have various regulations, social

¹ James Calder, "ESG vs CSR, Why Organizations Are Moving To ESG," *Assent*, last accessed June 15, 2023, <https://www.assent.com/solutions/esg-supply-chain/esg-vs-csr>

perceptions and therefore different reputational costs, shareholder protections and more. We discuss pertinent previous literature that explores different countries which assists us in understanding the effect of heterogeneous law systems.

Several other theoretical considerations exist whereby inferences depend on the treatment of insider trading and ESG data, which will be discussed within existing literature throughout the paper.

1.2 Structure

With consideration to the material factors that affect the correlation between ESG-promoting firms and insider trading practices, we look to review existing literature and provide a perspective on the aforementioned factors.

We review three comprehensive papers within the ESG and insider trading space:

1. **Gao et al.:** *Commitment to social good and insider trading*
2. **Carran et al.:** *Do CSR ethics dominate weak shareholder protection? The case of corporate insider trading in Europe*
3. **Hodgson et al.:** *Does stronger corporate governance constrain insider trading? Asymmetric evidence from Australia*

We also briefly review segments on arguments surrounding ESG and its presence, perception, and effectiveness:

1. **Berg et al.:** *Aggregate Confusion: The Divergence of ESG Ratings*
2. **Ioannou et al.:** *The Impact Of Corporate Social Responsibility On Investment Recommendations: Analysts' Perceptions And Shifting Institutional Logics*
3. **Yu et al.:** *Greenwashing in environmental, social and governance disclosures*
4. **Jo et al.:** *Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility*

We then proceed to provide a rudimentary empirical update to the ESG and insider trader debate through recent data from Australian equities.

1.2.1 Research Questions

While predominantly a review of existing literature, we look to answer some questions through said previous studies throughout this inquiry:

RQ1: Does ESG add to shareholder value and improve governance?

RQ2: Does ESG enable greenwashing and is therefore associated with poor governance?

RQ3: Does higher engagement in ESG result in decreasing insider trading profitability?

RQ4: Do differing legal systems affect the profitability within ESG-conscious firms and insider trading?

2.0 Notions in Existing Literature

We briefly acknowledge the intents and hypotheses of each paper, their empirical methodology and the resulting findings. The inferences gathered from each literature will assist in answering our proposed research questions.

2.1 Gao et al.

Gao et al. (*Commitment to social good and insider trading*) publishes in 2014, a report on a firm's commitment to CSR (equivalent to ESG) and its association with insider (informed) trading. They expected that executives of CSR-conscious firms to be more likely to refrain from informed trading (that is, a negative correlation).

The paper comprehensively explores several major factors that influence the insider trading and ESG correlation.

2.1.1 Empirical Overview

Gao's paper focusses on the association in the scope of companies in the United States of America.

Social ratings are drawn from *MSCI ESG STATS* (formerly, KLD) which utilises a combination of surveys, financial statements, press, academic and government articles to assess CSR performance over 100 indicators. The MSCI system defines the strengths and weaknesses between various ESG aspects. Gao defines a firm's adherence to good CSR practices by whether a firm has more CSR strengths than concerns.

Insider trading information is sourced from the *Thomson Financial Insider Filing Data (TFN)* with trades from C- level and president executives analysed.

After merging with CSR data, the samples totalled 10,496 insider purchases and 43,991 insider sales over 20,999 unique executives within 12,173 unique firms over 1992 to 2011.

Gao's measures insider trading profits through theoretical potential gains or avoided losses from sales, determined by a multi-linear regression, sourced from previous literatures. It consists of:

1. A binary variable on whether a firm is CSR-conscious or not at t-360
 2. A dummy variable on whether a firm incurs R&D expenses during t-360 to t
 3. A dummy variable on whether a firm has lost value since t-360
 4. A variable on the firm's volatility, t-360 to t-20
 5. A variable on the natural log of the number of analysts following the company at t-360
 6. A variable on the total volume of shares divided by outstanding shares since t-360
 7. A dummy variable on whether 75% of the trades in a firm occur within a 30-day window of an earnings announcement
-

8. A variable on the book-to-market ratio
9. A variable on the return from t-380 to t-20
10. A variable on the net income to the market-adjusted returns over the interval t-380 to t-20
11. A variable on the sales growth over the last 5 years
12. Standard OLS errors, clustered by each executive

To explore other effects, such as executive advocacy for CSR and heterogeneity between executive altruism, Gao modifies the above regression with differing control variables and utilises Logit probability models to answer such. Their findings are as follows.

2.1.2 Results

They find that executives of CSR-conscious firms profit less and trade less (prior to future news) than executives of non-CSR-conscious firms. They also find that the negative association is exacerbated when executives' personal interest is increasingly aligned with the firm.

They propose that the commitment towards a CSR-positive image will mean that apart from the increased profitability due to superior information verse the market in trading, there will be an implicit cost to the reputation of the firm and executives as the act of informed trading is unethical.

They explore whether damage to a firm's image implies personal costs for executives (and thereby discouraging insider trading). If an executive is more vocal about the firm's activities, it is expected that the firm's CSR orientation has a stronger constraint on trading as the executive's personal reputation is more closely associated. To determine how vocal an executive is, searches were done through the internet, news media, press releases and CSR reports. Gao found that the constraining effect of CSR was more pronounced for executives who were more vocal about CSR.

Also consider an executive's wealth tied within company stock. For an executive that has more wealth within the firm, it is expected that the constraining effect of CSR is more apparent. Gao finds that the negative association between CSR and executive insider trading profits are stronger when they hold more company shares. However, note that this inference is better explained through the constraint of executive heterogeneity rather than stock ownership, as the latter doesn't imply differences in altruism or greediness.

They also consider the degree of heterogeneity in the individual degrees of altruism amongst high-influence executives and the firm's CSR-compliance. Previous economic literature has suggested that individuals can exert idiosyncratic influences on firm-wide policies and a firm's CSR-compliance is therefore a manifestation of executive differences. They found that the negative correlation between CSR and insider trading remains robust with propensity-score matching (fixed-effects) as to alleviate endogeneity issues.

Other previous literature has suggested that involvement in CSR is done on the basis of providing an 'insurance' against negative events, meaning that there is a lower implied cost to insider trading for CSR-conscious firms, creating a positive association between CSR-compliance and insider trading. They find that the negative association found is inconsistent with the theory that CSR acts as an insurance policy for negative effects.

They also found that executives on average, profit from purchases rather than sales which is consistent with existing literature. The inference remained robust after controlling for proxies of information asymmetry, insider trading restrictions and contrarian trading tendencies.

A concern with measuring insider trading profits is that the price movements don't necessarily reflect the information asymmetry between executives and investors, rather, it is the market's reaction to the executives' trades itself. Previous literature addresses this by examining whether executives trade on future news as an alternative measure of insider trading. Gao finds that non-CSR-conscious firm executives are more likely to purchase shares with increases in future earnings change and stock returns, implying that executives trade on future news. Contrarily, they find that executives of CSR-conscious firms do not trade on future earnings or return performance, implying that the CSR-compliance and insider trading inference remains robust.

Throughout Gao's paper, we see that there is a clear established correlation between the restrictions within CSR-conscious firms and insider trading profitability. We establish a comprehensive answer to **RQ3**, that is, there is a negative correlation between CSR (ESG) engagement and insider trading profitability.

2.2 Carran et al.

Carran et al. in 2021 publishes a paper (*Do CSR ethics dominate weak shareholder protection? The case of corporate insider trading in Europe*) exploring the constraints of CSR on insider trading by looking at data from ten European countries, clustered by French-, German-, Nordic-sub-law and U.K. common law. French, German and Nordic sub-laws are based off Civil Law systems, as opposed to the U.K. (and other countries such as the U.S. and Australia) which utilise Common Law systems. The motivations to explore the general association between CSR and insider trading are similar to that of Gao et al.'s paper.

A motivation behind extending the research to several different countries is that much of the prior research is based within the U.S. environment, which promotes a strong regulatory ethic and therefore strong shareholder protection. By exploring these other countries, weak shareholder protection and lower insider trading regulations and their effects are examined. The paper also looks at CSR in its parts and totality.

Additional motivation to explore Continental Europe is that recent surveys have revealed that European consumers and investors are more willing to support CSR-conscious firms. Media coverage is also greater when in relation to CSR issues, thereby increasing commitment to CSR initiatives. Continental Europe's social issues portend higher ethics but have internal structure and governance issues which can possibly lead to increased expropriation by executives. Relative to common law countries, European civil law has lower investor protection rights with larger ownership clusters, lower independent directorships and lower shareholder voting powers. These regulatory and corporate factors seemingly contravene the interests of minority shareholders and imply a level of systematic unethical governance.

They find that the association between CSR trading can vary depending on the country's shareholder protection laws, with weaker shareholder protections resulting in a weaker correlation with CSR association and the easement of inside trading profits.

2.2.1 Empirical Overview

Carran samples over 16,989 insider purchases over 1027 unique firms over 2009-2017 and compare the highest tercile (CSR-consciousness) and the lowest tercile CSR firms in the U.K. (common law) against nine civil-law European countries.

Within the ten European countries, the breakdown is as follows:

1. Common Law
 - a. United Kingdom
 2. Civil / Code Sub-Laws
 - a. German (Austria, Germany and Switzerland)
 - b. Nordic (Norway and Sweden)
 - c. French (France, Italy, Netherlands and Spain)
-

CSR data is sourced through *Sustainalytics* and the *Wharton Research Data Services (WRDS)* which is reportedly a better metric than that of other papers (such as KLD / MSCI) due to the efficient use of publicly available data as opposed to survey-based rankings. Insider trading data is sourced from *2iQ Research* and excludes the exercising of employee stock options.

The baseline model utilised by Carran to estimate insider trading profits consists of a multi-linear regression that consists of:

1. A binary variable on whether the company is in the top CSR tercile
2. A variable on the natural log of book-to-market value of the firm
3. A variable on the market capitalization of the firm at the end of the last fiscal year
4. A variable on the sales growth of the firm over the last five years
5. A binary variable on whether the firm reports negative underlying earnings
6. A variable on the return of the firm from t-380 to t-20 days
7. A variable on the volatility of the firm's returns from t-380 to t-20 days
8. A variable on then number of analysts following the company
9. A variable on the natural log of the trading volume from t-380 to t-20 days
10. A variable on whether the firm has positive R&D expenses
11. Industry and Time fixed effects to control for unobserved factors

2.2.2 Results

Carran finds that between differing law systems, there is a high variability in the ethical influence of CSR on insider trading profitability. It is also found that within Continental Europe where shareholder protections are weaker (i.e., insufficient legislative protection afforded to minority shareholders), the negative correlation between CSR and profitability decreases. Such inference was robust to changes in CSR reporting quality, trading around annual reporting periods and CSR and insider control factors.

They also find that after decomposing CSR into its components, that lower inside profitability is driven by higher environmental scores but not social scores.

Committed Nordic firms recorded the strongest negative correlation to profitability, driven by social and environmental sub-scores. French firms ranked second with an insignificant impact by CSR with negative drivers (environmental) offset by an opposing social driver, while German firms recorded increased profitability driven by higher environment CSR. Such results were robust to firm control factors such as insider trading, alternative insider trading profitability models in addition to industry, firm and year fixed effects, propensity-score matching, CSR commitment measures and CSR rating adjustments.

Carran concluded that weak shareholder protection is a strong contributing factor when analysing the impacts of CSR induced ethical constraints on insider trading profitability with variance amongst CSR pillars. It was also found that decomposing CSR into individual pillars yielded better variance when it came to predicting impacts on profitability. Carran also concludes that the differing legal and social structures such as those found in Continental Europe reduces the ability of controlling shareholders to expropriate minority shareholders.

From Carran's paper, we can establish similar conclusions to Gao et al. in that a negative correlation between CSR-conscious firms and inside trading profitability is expected, further answering **RQ3**. We

also find that the Common Law data (U.K.) similarly follows the U.S. conclusions. These conclusions are different when compared to Continental European countries with Civil Law systems and therefore establishes that differing legal systems affect the correlation between CSR and insider trading profitability, assisting us in answering **RQ4**. We also note that Carran and previous literature stated that committing to CSR generally improves shareholder value as more investors look to pursue CSR-conscious firms. This finding assists in answering **RQ1**. However, we can see an opposing effect in Germany's result, where the environmental pillar within CSR has a positive correlation with profitability as opposed to the expected negative – this contributes to the case in **RQ2**, which opposes the view within **RQ1**. Further on, we explore how consistent this theme appears.

2.3 Hodgson et al.

Hodgson et al. publishes in 2020, a recent update to corporate governance and its restraint on insider trading (*Does stronger corporate governance constrain insider trading? Asymmetric evidence from Australia*).

The paper, similar to Gao et al. and Carran et al., investigates the role of governance in limiting insider trading profitability in the Australian market (ASX). However, the motivation is emphasised on the impact of internal governance controls with the paper underpinned by prior research which stated that: insider trading returns are higher in countries with stronger country-wide governance and within firms with more widely held ownerships, individual attitude heterogeneity is a major factors of insider trading returns with broad economy-wide regulations doing little to prevent such implying that direct firm-based constraints may be more effective.

2.3.1 Empirical Overview

The data used comprised of the top 250 companies in Australia from 2002 to 2014 with purchases and sale transactions from 2iQ Research. Market capitalisation and returns data were sourced from Datastream.

To evaluate the effects of internal governance controls, Hodgson utilises over 10 multi-linear models to examine the cumulative abnormal returns over the market given a level of restricted trading policies, firm size and corporate governance scores. The governance scores comprised of six broad areas, including the: board of directors, audit committee, remuneration committee, nomination committee, external auditors, and risk management.

2.3.2 Results

Hodgson finds that stronger governance results in reduced insider trading profitability. Interestingly, they found that there was no significant difference between the restrictiveness of trading policies. However, increased firm size (and the subsequent public scrutiny) and initial shifts towards restricted trading policies yielded material impact on insider trading activities.

They also noted however that the firm size and restricted trading policies reduce insider selling profitability but not purchase volume, value or profits. Insider sale profitability is reduced by overall governance, trading restrictions and restricted trading policies. It is from that, that Hodgson concludes that internal firm governance constrains insider sales but not purchases, contrary to other prior literature such as Gao et al.'s paper, which stated that increased governance constrained purchases. Hodgson suggests that the sales are constrained as sales are considered to negatively impact the wealth of shareholders, leading to increased monitoring. Hodgson's findings assist in answering **RQ3** but contributes with contrarian results to prior literature with respect to the purchase and sale datasets.

3.0 Environment, Social & Governance Scores (ESG)

While we have briefly reviewed papers that explore the correlation between ESG and insider trading profitability, it is important to also review the arguments around the use of ESG as a metric in the first place. ESG has been highly topical and at times contentious due to the various quirks that accompanying consistent ESG interpretations. Different rating systems, measurability issues and material effect in practice are common issues that arise when working with ESG.

In Jo et al.'s paper '*Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility*', Jo explores the importance of ESG and whether it has a material impact on firm value and governance. They find through empirical methods that engaging in CSR is positively associated with internal and external corporate governance mechanisms such as board leadership & independence, institutional ownership, analyst following and anti-taking over monitoring provisions. They establish that CSR positively affects firm value, with analysts following standing out as the strongest predictor. They also find that by engaging in internal social enhancement such as employee diversity, product quality and inter-firm relationships, that firm value is the most enhanced. These findings help establish that CSR is indeed material in practice, in both being established and in affecting firm value. This assists in answering **RQ1** in that ESG has a material effect on shareholder value and governance.

3.1 ESG in Practice

Arguments behind ESG are largely divided (Margolis et al., 2009), but studies such as Jo et al. have concluded that ESG does indeed establish a positive corporate image and instil higher firm values (Fombrun et al., 1990; McWilliams et al., 2006). ESG also aids in creating reputation capital and product pricing premiums, facilitating talent attraction (Fombrun et al., 1996) and improving consumer evaluations (Brown et al., 1997). A survey of Fortune 1000 firms also found that commitment to ESG was primarily motivated by reputation factors (Adam Friedman Associates, 2012). It's clear that ESG will at the least, be theoretically impactful.

With multiple well-known ESG metrics, there exists many data issues: unreviewed ESG data, a lack of global governing body, behavioural issues at a firm level and no regulatory guidelines on reporting ESG data (PRI, 2015; Khan et al., 2016; PRI, 2017; State Street Global Advisors, 2017; Fride, 2019; Schroders, 2017).

We postulate, as do many previous literatures, that ESG has a material effect in constraining opportunities behaviour in an environment with asymmetric information and idiosyncratic reputations. We further investigate below, how ESG is portrayed in practice and whether the notion of ESG is valid in practice, and if the current ESG rating systems are applicable for use.

3.1.1 Ioannou et al.

In *The Impact of Corporate Social Responsibility on Investment Recommendations Analysts' Perceptions and Shifting Institutional Logics* by Ioannou et al., the importance of CSR is analysed through the lens of investment analysts and how they perceive the validity of CSR and therefore its effects in firm value. Through assessment of 15 years of publicly traded U.S. firms from 1993-2007: It

was concluded that over time, analysts were increasingly optimistic in assessing firms which indicate that high-level investment analysts view CSR scores as a valid indicator and a material contributor to firm value. This aids us in understanding the role of ESG, the validity of our answers thus far to **RQ1** and its contribution to governance and firm value.

3.1.2 Yu et al.

Yu et al. in their paper *Greenwashing in environmental, social and governance disclosures* inquire about the existence of greenwashing in a selection of 1925 large-cap companies globally between 2012-2016. Together, with Asset4 ESG scores, Yu analyses the degree of greenwashing. Yu also decomposes the firm-level features, country-level and cross-listing statuses of the companies and whether greenwashing changes.

The paper, and previous literature, states that the existence of greenwashing is inevitable with imperfect guidelines in place to prevent such. An example of this is recent analysis of Australian companies by the local competition authority (ACCC) which showed that 40% of companies that claimed they were ESG-conscious were not engaging with expected practices.

Nevertheless, Yu finds that a higher share of institutional owners and independent directors will lead to less greenwashing. It was also found that companies in countries with less corruption and more political rights are less likely to greenwash. A peculiar inference is that cross-listed companies are less likely to engage in greenwashing.

The existence of greenwashing and the inferred ability to reduce it implies that poor governance may result from the engagement of ESG as per **RQ2**. However, it should be considered that while ESG as a metric enables greenwashing, the onus is on the supporting regulatory and social environment that will shape the utility of ESG as a governance monitoring mechanism.

3.1.3 Berg et al.

Berg et al. in their paper *Aggregate Confusion the Divergence of ESG Ratings* explore the divergence amongst six prominent ESG rating metrics:

1. Kinder, Lydenberg, and Domini (KLD)
2. Sustainalytics
3. Moody's ESG (Vigeo-Eiris)
4. S&P Global (RobecoSAM)
5. Refinitiv (Asset4)
6. MSCI

They decompose ratings and the divergence amongst them into contributions by scope, measurement and weight. Overall, they find that measurement factors contribute to 56% of the divergence, scope 38%, and weight 6%. Within measurement divergence, it was found that there was a 'rater effect' whereby the rater's overall view of a firm influences the measurement of specific

categories. The clear existence of this divergence makes it difficult to compare ratings amongst different agencies and therefore establish which company is an average performer.

Without a common structure between ESG ratings it is inevitable that there is some divergence amongst rating systems. When utilising ESG scores, there need be special consideration to the validity of ESG data. Berg also notes that investors may create their own ratings by imposing their own scope and weighting given multiple ratings agencies. Alternatively, it is suggested that global regulation can assist in creating a clearer definition of ESG performance factors and consistency. The paper concludes that rating agencies must be more transparent and clearer on the various facets of ESG performance, attributes and aggregation as to harmonize ESG disclosure amongst firms.

The various ratings and divergence amongst them mean that ESG to an extent, is subject to greenwashing if divergence leads a non-ESG-conscious company to be rated ESG-conscious – deceiving investors. This contributes to the idea that ESG enables greenwashing and subsequently poor governance practices (**RQ2**).

4.0 Methodology

To investigate our main inquiry, **RQ3**, we utilise the Insider Trading Profit model following Gao et al., 2014 (Gao et al., 2014):

$$\begin{aligned} \text{Insider Trading Profits}_t = & \alpha + \beta_1 \text{ESG}_{t-1} + \beta_2 \text{R\&D}_{t-1} + \beta_3 \text{Loss}_{t-1} + \beta_4 \text{Volatility}_{t-1} + \beta_5 \ln \text{Analyst}_{t-1} \\ & + \beta_6 \text{Turnover}_{t-1} + \beta_7 \text{BTM}_{t-1} + \beta_8 \text{RET}_{t-1} + \beta_9 \text{EP}_{t-1} + \beta_{10} \text{AvgGrowth}_{-5} + \varepsilon_t \end{aligned}$$

We use the above multi-linear model as a standard regression with controls across all tests of insider trading and ESG correlation. We explore various permutations of the insider trading data, including examining only purchases or sells, only C-level executives etc., in line with previous literature.

Following previous literature on insider trading, executive insider trading profits are measured as potential profits gained or potential losses avoided from sales (Huddart et al., 2007; Jagolinzer et al., 2011). To do this, we use 90-day, 120-day and 180-day trading windows to establish insider trader profits. The ESG factor is determined by whether a firm has a lower ESG score (i.e., less exposure to risks) than the median of the dataset.

The control variables include:

1. $\text{R\&D}_{t-1}$: A dummy variable on whether a firm had a positive R&D expense in year $t - 1$.
2. Loss_{t-1} : A dummy variable on whether the firm has reported negative earnings in year $t - 1$.
3. Volatility_{t-1} : The variance of the daily stock returns over the interval (-380, -20).
4. $\ln \text{Analyst}_{t-1}$: The natural log of the one plus the number of analysts following in the year $t - 1$.
5. Turnover_{t-1} : The natural log of trading volume over the interval (-380, -20) over shares outstanding.
6. BTM_{t-1} : The book value of equity over market value of equity (book-to-market) in the year $t - 1$.
7. RET_{t-1} : Market-adjusted returns over the interval (-380, -20).
8. EP_{t-1} : The ratio of net income for fiscal year $t - 1$ to the market value of equity $t-20$.
9. AvgGrowth_{-5} : The weighted average sales growth from $t - 5$ to t .

4.1 Insider Trading & ESG Data

Insider Trading data is sourced from 2iQ Research which contains trading dates, pricing and currencies in addition to company and insider information from 2002 to 2023. We filter by companies listed on the Australian Stock Exchange (ASX). With the current iteration of Sustainalytics data, the resulting dataset produced transactions with ESG scores between 2018-2020 due to limitations with Sustainalytics and 2iQ data ranges. The resulting data contained 3058 transactions, 161 unique companies and 818 unique insiders.

Data for ESG scores in our analysis is obtained through Sustainalytics. Sustainalytics is a ESG rating system first created in 1992 and covers over 10,000 companies globally. The service is generally more efficient than other methods due to its use of publicly available data which addresses the bias

issue which affect survey response-based metrics (Chatterji et al., 2009). Sustainalytics also provides separate indices which allow us to test results between environmental, social and governance dimensions of ESG. Sustainalytics conducts scoring using raw exposure scores, manageability scores and a final 'managed' score, which incorporates both the exposure to an ESG issue in conjunction with how manageable it is. For the purpose of this inquiry, we use the final managed score to test our hypotheses.

5.0 Results

Consistent with Gao's paper, and other prior literature, we found that executives most commonly profited from purchases but not sales (Aboody et al., 2000; Huddart et al., 2007; Jagolinzer et al., 2011). We only focus on the results of purchase transactions accordingly. We also note that there was no material difference in association when filtering by tier of executives.

We also find evidence that there is a negative correlation between ESG and insider trading profits. That is, if you are more exposed to ESG issues and are therefore less committed to ESG, you are likely to have higher profits from insider trading. This coincides with all previous literature as discussed in this paper and similar.

Interestingly, testing on the individual pillars of ESG (environmental, social, governance) yielded no reasonable inference regarding relations to inside trading profitability. Also interestingly, is across all regressions, 180-day returns produced negligible results, if at all. 120-day and 90-day returned at a 10% statistical significance, with evidence of ESG and insider trading profits being negatively correlated. A shorter returns date (such as before 180-days) providing such inference may be reasonable given that acting on insider information and anticipating the subsequent market price adjustment likely need not extend past 120 days. While our basic inference on the association remains in line with prior literature, the 180-day regression remains a question due to notable successful usage in papers such as Gao et al., 2014.

5.1 Descriptive Statistics

Table 1

This table reports the final dataset used for regression analysis by year. The sample consists of purchases by executives within Australian listed equities covered by the Sustainalytics ESG rating database and 2iQ research. The number of transactions, types, firms and executives are all given as unique figures in each period.

Year	Transactions						Firms		Executives	
	Total		Purchases		Sales		N	Pct	N	Pct
	N	Pct	N	Pct	N	Pct				
2018	978	89.81%	460	74.80%	518	109.28%	129	80.12%	437	85.85%
2019	991	91.00%	499	81.14%	492	103.80%	143	88.82%	418	82.12%
2020	1089	100.00%	615	100.00%	474	100.00%	161	100.00%	509	100.00%

Table 2: Descriptive Statistics

This panel reports the descriptive statistics of the sampled executive insider trades. Note that variables such as *R&D* and *Loss* are dummy variables.

	CSR-conscious sample			Non-CSR-conscious sample		
	Mean	Median	Std. dev.	Mean	Median	Std. dev.
<i>R&D</i> _{<i>t-1</i>}	0.0764	0.0000	0.2658	0.0664	0.0000	0.2492
<i>Loss</i> _{<i>t-1</i>}	0.0887	0.0000	0.2845	0.1073	0.0000	0.3097
<i>Volatility</i> _{<i>t-1</i>}	36.6273	33.4054	15.1075	28.7477	24.9692	13.4652
<i>InAnalyst</i> _{<i>t-1</i>}	3.3698	3.4849	0.4621	3.3302	3.3979	0.4465
<i>Turnover</i> _{<i>t-1</i>}	-0.2499	-0.2517	0.4601	-0.4018	-0.3713	0.4331
<i>BTM</i> _{<i>t-1</i>}	6.1295	2.8415	9.1134	4.0403	3.1540	4.9725
<i>RET</i> _{<i>t-1</i>}	-0.0244	-0.0915	0.4715	0.0274	0.0207	0.2685
<i>EP</i> _{<i>t-1</i>}	0.0473	0.0445	0.0421	0.0471	0.0546	0.0842
<i>Avg_Growth</i> _{.5}	0.1783	0.0620	0.4620	0.1313	0.0734	0.2652

Table 3: Correlation matrix

This panel reports the Pearson (below diagonal) and Spearman (above diagonal) correlation coefficients.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) <i>R&D</i> _{<i>t-1</i>}		-0.0225	0.0309	0.0312	-0.0012	-0.0199	0.0283	-0.0946	0.0128	-0.0494	0.0194
(2) <i>Loss</i> _{<i>t-1</i>}	-0.0225		0.2421	-0.3090	0.1120	-0.1268	0.1012	-0.6222	0.2990	-0.0985	-0.0312
(3) <i>Volatility</i> _{<i>t-1</i>}	0.0309	0.2421		-0.2314	0.1983	-0.1106	-0.1715	-0.2664	0.2881	0.1603	0.2659
(4) <i>InAnalyst</i> _{<i>t-1</i>}	0.0312	-0.3090	-0.2314		0.1850	0.1603	0.1510	0.1346	-0.1950	0.1730	0.0436
(5) <i>Turnover</i> _{<i>t-1</i>}	-0.0012	0.1120	0.1983	0.1850		-0.0876	-0.0398	-0.0350	0.1196	-0.0382	0.1677
(6) <i>BTM</i> _{<i>t-1</i>}	-0.0199	-0.1268	-0.1106	0.1603	-0.0876		-0.0587	0.1065	-0.1292	0.0138	0.1421
(7) <i>RET</i> _{<i>t-1</i>}	0.0283	0.1012	-0.1715	0.1510	-0.0398	-0.0587		-0.0306	0.3992	-0.0017	-0.0679
(8) <i>EP</i> _{<i>t-1</i>}	-0.0946	-0.6222	-0.2664	0.1346	-0.0350	0.1065	-0.0306		-0.1064	0.0118	0.0016
(9) <i>Avg_Growth</i> _{.5}	0.0128	0.2990	0.2881	-0.1950	0.1196	-0.1292	0.3992	-0.1064		0.0123	0.0628
(10) <i>Trading Profit (180 - Days)</i>	-0.0494	-0.0985	0.1603	0.1730	-0.0382	0.0138	-0.0017	0.0118	0.0123		0.0579
(11) <i>ESG</i> _{<i>t-1</i>}	0.0194	-0.0312	0.2659	0.0436	0.1677	0.1421	-0.0679	0.0016	0.0628	0.0579	

5.2 Regression Results

Table 4: Insider trading profit regression against ESG, controls

	Profit (t + 180)		Profit (t + 120)		Profit (t + 90)	
	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
<i>Intercept</i>	-0.6564	< 2e-16 ***	-0.5213	< 2e-16 ***	-0.3468	2.87e-11 ***
<i>ESG_{t-1}</i>	-0.0006	0.9689	-0.0352	0.00524 **	-0.0303	0.00641 **
<i>R&D_{t-1}</i>	-0.0810	0.00519 **	0.0088	0.70257	0.0039	0.8474
<i>Loss_{t-1}</i>	-0.0958	0.00613 **	-0.0356	0.20229	-0.0496	0.04403 *
<i>Volatility_{t-1}</i>	0.0051	< 2e-16 ***	0.0039	3.47e-16 ***	0.0034	1.10e-15 ***
<i>InAnalyst_{t-1}</i>	0.1573	2.23e-16 ***	0.1213	2.05e-15 ***	0.0805	2.00e-09 ***
<i>Turnover_{t-1}</i>	-0.0843	2.23e-06 ***	-0.0430	0.00245 **	-0.0245	0.04971 *
<i>BTM_{t-1}</i>	-0.0006	0.5377	-0.0017	0.04427 *	-0.0007	0.3564
<i>RET_{t-1}</i>	-0.0001	0.9953	-0.0047	0.7984	0.0048	0.7684
<i>EP_{t-1}</i>	-0.0846	0.5620	0.0413	0.7231	-0.0456	0.6577
<i>Avg_Growth₋₅</i>	0.0215	0.3822	0.0363	0.0648	0.0268	0.1226
<i>N</i>		1516		1516		1516
<i>R² (%)</i>		9.89		10.02		20.18

The regression above is estimated on the basis of executive purchases only. As previously mentioned, we find that for trading profits 90 and 120 days after the trade date, there exist a strong case that ESG does materially impact insider trading profits. However, not in line with prior literature is the lack of such inference in the 180-day profit regression.

However, note that there are many other factors that are endogenously determined by firms which may affect their engagement in ESG. Other factors such as score validity and greenwashing are other factors that are not incorporated in this model. As such, inferences between ESG and insider trading profits may be spurious.

As previously mentioned, note the low statistical importance when regressing with 180-day returns. This is heterogenous to prior literatures.

6.0 Conclusion

We conclude with brief comments on the findings in this paper, issues, and future motivations

Throughout the paper, we established research questions and attempted to build answers towards them. We see that RQ1 (Does ESG add to shareholder value and improve governance?) has clear impact on shareholder values and governance, not only through Jo et al.'s paper, but also Carran et al.'s publication. RQ2 (Does ESG enable greenwashing and is therefore associated with poor governance?) has seen evidence of existence in both prior literature in Carran et al., Yu et al. and Berg et al.'s interpretations. RQ3 (Does higher engagement in ESG result in decreasing insider trading profitability?) is answered with the initial reviews on insider trading and ESG literatures – that is, higher engagement in ESG does result in decreased insider trading profitability. We also prove this within our own brief analysis of Australian data. RQ4 (Do differing legal systems affect the profitability within ESG-conscious firms and insider trading?) is predominantly explored through Carran et al.'s paper which demonstrate differences amongst law systems and the subsequent ESG and insider trading associations. Similar to Gao et al., Carran et al., and Hodgson et al., we find that Australia as a common law country behaves in the same way that such prior literature has also inferred.

Future studies within this topic should consolidate and refine ESG scores as it is clear there remains consistency issues between ESG rating agencies. Further control variables and more considerable factors beyond those utilised in our empiric analysis will likely increase confidence in establishing the correlation between engagement in ESG and insider trading profitability.

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