

Ethics Culture in the Corporate Reporting Function, Financial Reporting Quality and Investor Reaction: Evidence from Australia

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Preface

This report is a research project conducted by the authors at the University of Queensland, with the funding from CPA Australia, under Global Research Perspectives Program (GRPP) (Grant No. – 006/2021), with the theme "Ethics and Integrity in the Accountancy Profession and Business Environment".

All views and opinions expressed in this report are solely those of the authors and do not necessarily represent the official views and opinions of The University of Queensland or CPA Australia.

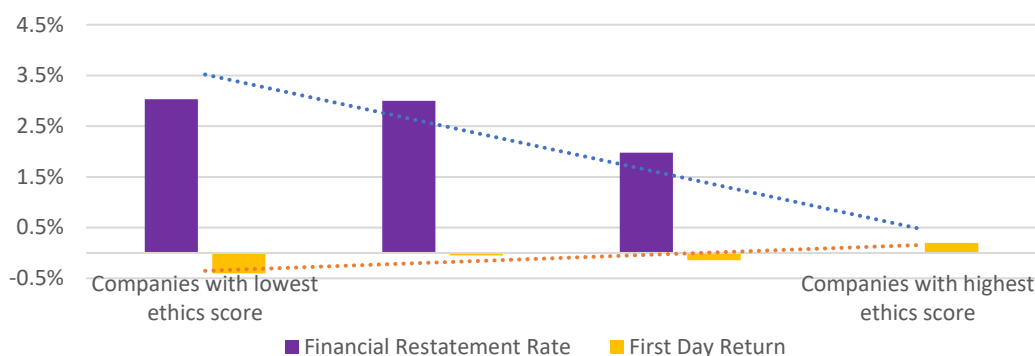
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Impact of Ethical Culture on Financial Reporting Quality and Investor Reaction

Truc (Peter) Do of the University of Queensland and Tran (Deborah) Ngo (Independent)

Ethical Culture Makes a Difference

- Firms with **better ethics scores have higher financial reporting quality**. For every one-point increase in a company's ethics score, the likelihood of their financial statements being restated reduces by 36 per cent.
- Investors' reactions to the financial statements of firms with better ethics scores are stronger**. For every one-point increase in a company's ethics score, the stock returns on the day of financial restatement release are 0.2 per cent higher.



What we considered

- Developing an **innovative measure of the level of ethics at the corporate reporting function** using reviews posted on social media
 - Examining the relationship between **the level of ethics at organisations' corporate reporting functions (using the developed measure) and the financial reporting quality** of the organisation
 - Examining the **relationship between the level of ethics at the organisations' corporate reporting functions and the investors' reaction** to the financial information released by the firm
-
- 3,609 reviews from current and former employees** were assessed
 - For ASX 100 companies in the period 2008-2022**

What we did

- 3,609 reviews on [glassdoor.com](https://www.glassdoor.com) from current and former employees** collected.
- A sample of 300 random reviews were manually **assigned scores based on the ethics level inferred** from the review (from -10 for lowest ethics to 10 for highest ethics)
- An **innovative AI tool was used** to analyse the natural language and to interpret the messages conveyed about the ethics of an organisation
- After confirming the accuracy of the algorithm (93 per cent of actual ethics score) used in the sample, **all reviews were assessed and assigned ethics scores**
- Using ethics scores as a proxy for ethical culture quality of corporate reporting functions, correlations between the scores and reporting quality were determined.**

Significance

- The **ethical culture of corporate reporting functions**, as assessed by those working in that function, **appears to matter when it comes to reporting quality**.
- Firms and regulators have a **potential new means by which to assess ethical culture** to further consider and explore.

About the Authors

Dr Truc (Peter) Do (CA, PhD) is a Senior Lecturer in Financial Accounting at the School of Business at University of Queensland, Australia. His main research interests lie in financial accounting, where he examines peer interaction and its impact on economic outcomes, as well as the effects of personal characteristics, such as culture and ethics, on accounting. He is especially interested in conducting research that has real impact on the industry and practitioners. He has received several awards for teaching and research in his academic career. Prior to joining academia, he had industry experience in financial industry where he worked for an auditing firm and a multinational bank.

Ms Tran (Deborah) Ngo (CPA, Msc) is an industry practitioner, and has always been passionate about bringing industry insights and perspectives into academic research. She used to serve as Senior Audit Analyst at Audit & Assurance, Deloitte Australia, with a focus on financial statement audit for financial service clients. Prior to joining Deloitte Australia, she was an audit associate at Deloitte Singapore. She also served as a casual case study writer for the Audit subject at the School of Business at University of Queensland.

Introduction

Professional ethics is very important to the accounting profession as accountants are entrusted with the responsibility of ensuring that accurate information is reported in the public interest. Numerous regulators and professional accountancy organisations (PAOs) around the world issue codes of ethics for professional accountants. The International Ethics Standards Board for Accountants (IESBA) renamed its ethics code in 2019 as “International Code of Ethics for Professional Accountants (including International Independence Standards)” and espouses the fundamental principles of integrity, objectivity, professional competence, due care, confidentiality and professional behaviour to recognise the profession’s responsibility to the public interest. In Australia, the Accounting Professional & Ethical Standards Board (APESB) re-issued its APES 110 Code of Ethics in 2018 with 4 parts, applicable to members of Australia’s three PAOs and stresses the professional obligations and ethical requirements on all of these members. All PAOs work to address and give guidance to their members on ethics issue. For example, CPA Australia has an Ethics and Professional Standards Centre of Excellence comprising members who provide guidance to management on policy and issues relating to ethics and professional standards. Almost all practicing accountants must demonstrate they meet ethical training requirements on an annual basis before they can renew their membership. All of these examples show that the issue of ethics is taken very seriously in the accounting profession.

Part of the reasons why ethics is emphasised so strongly is because several high-profile scandals (the likes of Wirecard and Carillion) have seriously eroded public trust in the accounting profession. Ethical issues arise daily for both public accountants and commercial accountants and they need to deal with these issues with critical mindsets. Despite its utmost importance, research into ethics is relatively limited possibly due to the difficulties in capturing ethics at the corporate level. Prior studies tend to rely on interviewing a few key personnel to

understand the ethics of organisations. However, this method inherently suffers from personal biases. They are also hard to conduct on a large scale for a more comprehensive study. In this study, we propose a novel method to capture the ethics level of the reporting functions at different organisations and use that measure to answer several important questions about the consequence of ethics for the organisations.

The three main objectives of this study are:

1. Can we develop a reliable measure of the level of ethics at the corporate reporting function?
2. Is there a relation between the level of ethics at the corporate reporting function (using the developed measure) and the financial reporting quality of the firm?
3. Eventually, is there a relation between the level of ethics at the corporate reporting function (using the developed measure) and the investors' reaction to the financial information released by the firm?

Our innovative method captures important insights from Big Data that is increasingly becoming common all around us, brought about by the high penetration of social media in daily life. Combined with artificial intelligence (AI) and data analytics, our measure of corporate ethics at the reporting function is just one of the examples that shows how new technology can enable us to do more powerful things in the future. We defer the detailed discussion of how our measure is developed to the Research Design section of this report, on page 15, to avoid repetition. The reason why we adopt this new method is because the power of data analytics and Big Data is vast, and it is estimated that hundreds of thousands of professionals need to be recruited by 2026 to meet the increasing demand from this emerging technical field (Maurer, 2021).

Our study complements prior research that has taken some preliminary steps into investigating the benefits of ethics for an organisation in its financial reporting capacity. Labelle et al. (2009) approach ethics from the angle of diversity in governance. For example, organisations that have stakeholder-oriented policies and exert more efforts to recruit and integrate minorities and women in the workplace are considered to be more ethical organisations. While this makes intuitive sense, critics can easily argue that this is just one aspect of ethics with respect to personnel management and does not necessarily capture the whole spectrum of corporate ethics. There is clearly a need for more future studies to examine corporate ethics more directly.

Our study is also timely given the ongoing discussion regarding how business misconduct should be addressed, especially in financial services. In 2019, the Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry (chaired by Commissioner Kenneth Hayne) published the final report and highlighted the formation of a new Commonwealth standard setting body, the Financial Adviser Standards and Ethics Authority (FASEA), to develop ethics requirements and govern the professional standing of the financial services sector. The report also reiterates the importance of managing company's culture (including ethics) to ensure a well-functioning economy in its Recommendation 5.6. Specifically, it requires entities, as often as reasonably possible, to take proper steps to assess the entity's culture and its governance, to identify any problems with that culture and governance, to deal with those problems, and to determine whether the changes it has made have been effective (Hayne, 2019). This also ties in nicely with the approach taken by the Australian Securities & Investments Commission (ASIC) that has done a lot of work on emphasising the importance of corporate culture, especially during periods of high economic uncertainty and low trust environment. In one of his recent speeches, ASIC Commissioner John Price urges companies to review "how standards of behaviour are set within firms, and whether

values are being translated into business practices, especially when these may affect customer outcomes” and ultimately, “whether the culture of a firm (or an industry sector) promotes fair treatment of consumers and investors” (Price, 2018).

The report proceeds as follows. In the next section, we discuss the theoretical framework of how corporate ethics can impact financial accounting. We then proceed to discuss our research methodology, with detailed information on sample selection, how the AI algorithm is developed, and our variables measurement. We then discuss the analysis of the empirical results. Finally, we conclude our report with some discussion and recommendations for future research.

Theoretical Framework

Reidenbach and Robin (1991) develop a conceptual model of corporate moral development that encompasses five stages. Depending on the concern for profits and ethical issues, organisations can be classified as amoral (unbalanced concern for profits and ethics), legalistic, responsive, emerging ethical, and finally ethical (balanced concern for profits and ethics). The moral development of an organisation depends on the cultural beliefs of top management (tone at the top), the shared values of employees, and the mechanisms (such as reward systems) put in place to reinforce important values that the organisation embraces. Please refer to Figure 1 below for a quick summary of the model.

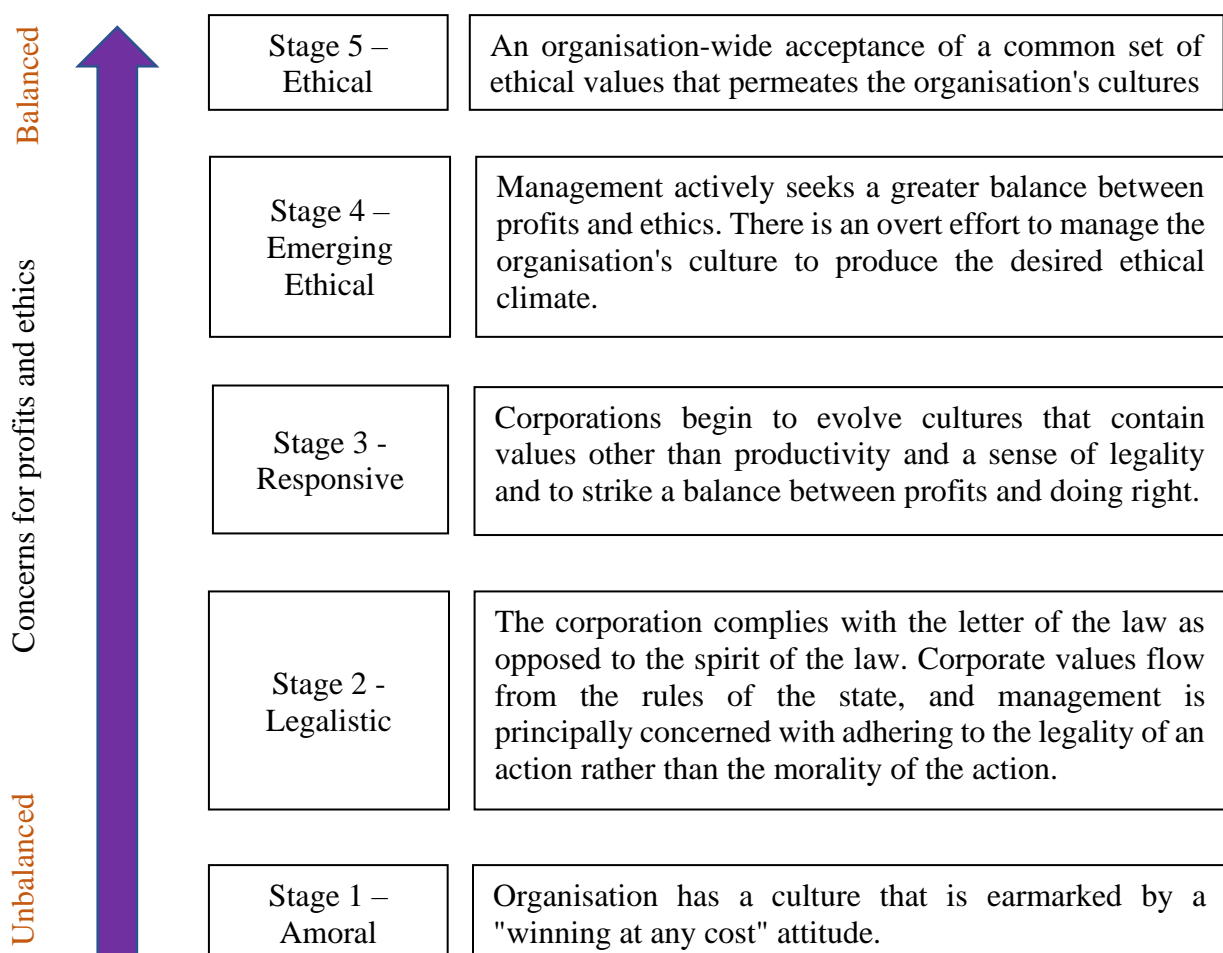


Figure 1 – A model of corporate moral development, adapted from Reidenbach and Robin (1991)

Different organisations (or different departments within the same organisation) are at different stages of their moral development, and it is arguable that there is a relation between the moral / ethical development of the organisation and its financial reporting quality. At the most basic level, organisations with low ethical development may simply resort to fraudulent reporting practices to mislead stakeholders. The infamous case of Enron highlights how management personnel were so willing to disregard generally accepted accounting principles (GAAP) to report fictitious figures and distort accounting figures to advance their agendas. Employees who are stuck in less morally developed organisations feel the need to “play the game” and less attention is paid to how unethical reporting practices can affect external stakeholders as their needs to survive triumph. At higher levels of moral development, corporate accountants more naturally exercise professional judgement in accordance with accounting and ethics standards, rendering a higher informativeness of accounting figures. At the highest level of ethical development, safeguards are put in place (such as a whistleblowing policy) and the right tone at the top encourages all employees to employ the best practices and accounting figures are prepared with the highest level of care, without any hidden agenda. This theoretical discussion sets the background of one of our research objectives; that is, to investigate whether there is relation between the level of ethics at the corporate reporting function and the financial reporting quality of the firm.

Ultimately, the financial reporting quality of a firm will affect how its investors (both existing and potential) respond to the release of their financial figures. The Efficient Market hypothesis states that share prices should reflect all information about the firm, including the financial reporting quality of the firm. There are many channels for information about the ethics level of an organisation to be disseminated to its investors. It could come from the existing employees who diffuse such information to their friends, and family members through social interactions. It could come from third parties that regularly deal with the organisation such as

suppliers and even external auditors. To the extent that the level of ethics at an organisation can compromise its financial reporting quality and investors are aware of this, we expect the investors' reaction to financial figures to be weaker when the organisation is known to have a lower ethics level. It is our next research objective to investigate this conjecture.

Although our discussion in this section is highly theoretical, a layperson discussion and several real life examples can be found in Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry Final report. The report highlights some key observations on how / why low business ethics can cause harm, and they include:

- Rewards have been paid regardless of whether the person rewarded should have done what they did (i.e., the employees are even rewarded if they disregard ethics in their work, as long as they hit performance targets)
- Entities that broke the law were not properly held to account. Misconduct will be deterred only if entities believe that misconduct will be detected, denounced and justly punished. Misconduct, especially misconduct that yields profit, is not deterred by requiring those who are found to have done wrong to do no more than pay compensation.

Essentially, the laws are not enough to ensure companies do business in the best interests of consumers and investors, as many loopholes exist, and conflicts of interests abound. This gives business incentives to misreport to achieve certain benefits at the expense of investors. Only a strong ethical foundation can help to alleviate these problems as this is the first and possibly, best line of defence against business misconduct.

Research Design

In this section, we discuss how we develop our measure of corporate ethics and how we design empirical tests to fulfil our research objectives. Firstly, we explain why we have adopted the AI technology and our choice of social media data to develop our measure.

Artificial Intelligence (AI)

The rise of AI in recent years is hard to miss and its application in business research is becoming more prominent with almost 1,500 research papers published on this topic on the Web of Science / Scopus database of published research (Loureiro et al., 2021). The concept of AI has been around since ancient times (e.g. Greek mythology of the bronze automaton Talos) and involves a non-human object capable of wisdom and information processing like a real mind. The rise of AI coincides with machine learning, where we now can train computer programmes to recognise patterns and extrapolate learned patterns to new scenarios, and this functionality is now used frequently in contemporary research (Do et al., 2023). Prior research on business ethics tends to rely on researchers interviewing and interpreting messages conveyed by the research participants. In our views, it will be an important incremental step forward if we can reduce this time-intensive process of human researchers collecting and interpreting information from research participants. Hence, we experiment with AI as an innovative tool to directly interpret the messages conveyed about the ethics of an organisation.

Big Data

To successfully create AI that is capable of thinking like humans, we need a large amount of reliable data to serve as training and testing data in the AI creation process. This is where Big Data comes in. This concept refers to sources of data that are being created at high volume, high velocity and which are also rich in variety (Zhang et al., 2021). Quite naturally, the term Big Data is a buzzword nowadays thanks to advent and usage of social media. Almost

any social media user is creating data and the privilege of data creation is not restricted to some gatekeepers like in the past. Furthermore, these data created by social media users are easily accessible to researchers. A lot of social media sites catering to professional careers have been created and inherently capture different aspects of corporate organisations. Data from these social media sites can be analysed to understand the ethics of organisations, through the help of AI.

Research Methodology Overview

To marry the two concepts, we have come up with the novel idea of creating a machine learning programme that can measure the ethics level of organisation through employees' postings about the organisation on social media. Specifically, we collect employees' reviews from Glassdoor.com, which is a social media site that allows current and former employees to anonymously review their employers. Glassdoor.com verifies that each review of a company comes from real employees "through technological checks of e-mail addresses and through screenings by a content management team". An increasing amount of research is being conducted using data from this site due to its ease of accessibility and high accuracy in capturing real employees' comments (Dube and Zhu, 2021). Employees write reviews that are grouped into Pros and Cons, and these reviews are tagged with the department, location, etc. We then develop a natural language processing (NLP) Python programme to read these employee reviews and assign an ethics score for each employee's review. We aggregate these ethics score at firm-year level, i.e., we compute an ethics score for each firm for each year in the sample. This is the main independent variable of interest which we use to study the association between the ethics level of each organisation and its financial reporting quality and investors' reaction to its earnings release, by running regression analysis.

Sample Selection

As this is only a preliminary study, we limit our sample to the biggest and most important firms in the Australian market, by focussing on the ASX 100 firms for the period 2008 – 2022. ASX 100 firms are the biggest firms in Australia by market capitalisation and account for almost 63% of the equity market in Australia. These firms attract a lot of attention in the market due to their importance in the Australian economy and naturally, there are a large number of employees' reviews about these firms for our analysis. At the same time, we can more readily capture financial data about these firms from commercial databases with greater ease.

Algorithm Training

We collect employees' reviews from ASX 100 firms for the period 2008 – 2022 and limit our analysis to only employees working in Finance and Accounting Function, as these staff members are directly involved in the preparation of financial statements. We collect a total of 3,609 employee reviews in the sample period, and each review has "Pros" and "Cons" sections. One review is shown in Figure 2.

1.0 ★ ★ ★ ★ ★ ✓

Former Employee, less than 1 year

No Real Managers Available

✗ Recommend ✗ CEO Approval ✗ Business Outlook

Pros

I actually don't think there are any

Cons

Poor management, extreme expectations, no leader ship. The whole environment exists on people trying to backstab or set other co workers up for a fall in the aim of career progression. One of the worst and most sour companies I have worked. Extremely unprofessional. If only the share holders knew how their "profits" were made.

Figure 2 – An example of an employee's review on Glassdoor.com

For each employee's review, we separate the Pros and Cons and have two qualified people score them separately. The Pros review is graded between 0 and 10, where 10 is awarded

to the review with the best ethics / integrity culture. The Cons review is graded between 0 and -10, where -10 is awarded to the review with the worst ethics / integrity culture.¹ We then sum the Pros and Cons scores to have an overall score for the ethics of the organisation. We randomly select a sample of 300 reviews as our training sample and score all of these reviews. The consistency between the two coders is high, at 89%, and when there is a discrepancy, the two coders discuss to derive a final score.

We then use this training dataset to train our Python programme. The algorithm is able to read these reviews (Pros and Cons separately) and predict the scores for “Pros” and “Cons” separately. The programme employs *TextBlob*, a Python library for processing textual data, to predict the sentiment of the “pros” and “cons” independently. At the same time, the programme is also further trained with the training data to recognise high frequency words that can further improve the accuracy of predicting the ethics score. Once we are happy with the (in-sample) prediction accuracy of the algorithm, we then test it again with another 100 reviews (separate from the training sample). The process of obtaining the ethics score for these 100 reviews is the same as before. The mean squared error (MSE) of our algorithm, compared with the actual rating is 1.44, as detailed in Figure 3 on the next page. It means that the predicted score is about 1.4 points away from the actual score. Given that the range of the possible ethics score is -10 to 10, this represents about 7% error rate and the accuracy of our algorithm is as high as 93%. We are happy with this accuracy rate for a preliminary study like this project. We then use this trained algorithm to process all the remaining employees’ reviews and assign an ethics score for each review. Predicted ethics score are then aggregated at a firm-year level (by taking the total ethics score across all reviews, divided by the number of reviews for the firm in the year). There is one average ethics score for each firm in each year in the sample.

¹ Some of these comments are not directly about the reporting ethics of the organisation, but we take comfort in the fact that ethics problems are multifaceted and an organisation with ethics problem in one area is likely to suffer in various other areas (including reporting) as well.

	Total squared error (TSE)	Mean squared error (MSE)
In-sample (N = 300)	315	1.05
Out-sample (N = 100)	144	1.44

Figure 3 – Accuracy of the trained algorithm

Regression Specification

To investigate how the ethics level of an organisation affects the financial reporting quality, we run the following regression equation:

$$restate_{it} = \alpha + \beta_1 ethics_score_{it} + \beta_2 assets_{it} + \beta_3 btm_{it} + \beta_4 leverage_{it} + \beta_5 roa_{it} + \beta_6 sales_growth_{it} + \beta_7 pct_indep_{it} + \beta_8 cfo_{it} + e_{it}$$

(Equation 1)

where $restate_{it}$ is an indicator variable equal to 1 if the financial statement for firm i in year t is restated in the future.^{2,3} Restatement signals that the financial statement is of a low quality (Dechow et al., 2010), and data on restatement is collected from SIRCA (Securities Industry Research Centre of Asia-Pacific), a leading provider of online services to support finance and other data-intensive research at universities. $ethics_score$ refers to the annual ethics score, with higher values indicating higher organisational ethics. The computation of this variable is discussed in the earlier section. We expect β_1 to be significantly negative, meaning that organisations with higher ethics should have lower instances of restating their financial statements – evidence of higher financial reporting quality. Other control variables include $assets$, the natural logarithm of the total assets; btm , the book to market ratio, computed as the

² For the sake of brevity, we will omit i and t in future discussion, but the convention applies throughout the report.

³ As $restatement$ is an indicator variable, we use Logistic regression to estimate the equation.

book value of equity divided by the market value of the firm; *leverage*, the leverage ratio, computed as the value of liabilities divided by the total assets; *roa*, the return on assets, computed as the net profit divided by total assets; *sales_growth*, the annual sales growth, computed as the percentage change in annual sales growth; *pct_indep*, the percentage of directors in the board that are independent; and *cfo*, the cash flow from operations, scaled by total assets. All of these variables are collected from SIRCA database, and they are controlled for because prior research has demonstrated that firm and board characteristics have sizeable impact on the financial reporting quality of the firm, as well as other important firm outcomes (Cao et al., 2012; Do, 2023; Do and Herbohn, 2023).

To investigate how ethics level of an organisation affects the investors' reaction in the stock market, we run the following regression equation:

$$\begin{aligned} returns_{it} = & \alpha + \gamma_1 ethics_score_{it} + \gamma_2 assets_{it} + \gamma_3 btm_{it} + \gamma_4 leverage_{it} + \gamma_5 roa_{it} + \gamma_6 \\ & sales_growth_{it} + \gamma_7 pct_indep_{it} + \gamma_8 cfo_{it} + e_{it} \end{aligned}$$

(Equation 2)

where *returns* is the market stock returns on the first day the financial statement is issued to the public.⁴ We choose to look at returns on the first day because market reaction is strongest when the news is freshly released to the market (Ball and Brown, 1968). We expect γ_1 to be significantly positive, meaning that organisations with higher ethics should have stronger market reaction, and more positive stock returns. The rest of the control variables are the same as before. All variable definitions can be found in the Appendix.

⁴ As *returns* is a continuous variable, we use Ordinary Least Square (OLS) to estimate the regression.

Analysis of Results

Our final sample consists of 405 firm-year observations where we can get the data on all the variables of interests.

Descriptive Statistics

Table 1 reports the descriptive statistics of the variables in this study. Financial restatement is a rare event and only about 2% of financial restatements are later restated (mean of *restate* is 0.02). This is likely due to the fact that our sample consists of the highest quality firms in Australia, being the ASX 100 firms, so they pay a lot of attention to their financial reports. Stock returns for the first day are minimal, at just about -0.1% (mean of *returns*), which is normal for daily stock returns. The mean of *ethics_score* is 0.202, meaning that on average, employees are neutral about the companies they work for.

Variable	Variable name	(1) mean	(2) sd	(3) median	(4) min	(5) max
Financial restatement	<i>restate</i>	0.020	0.139	0	0	1
Stock returns	<i>returns</i>	-0.001	0.024	-0.002	-0.149	0.098
Ethics score	<i>ethics_score</i>	0.202	1.291	0	-8	6
Total assets	<i>assets</i>	22.91	1.143	22.86	18.88	26.27
Book-to-market ratio	<i>btm</i>	0.626	0.501	0.800	0.001	4.710
Leverage	<i>leverage</i>	0.498	0.181	0.480	0.028	0.971
Return on assets	<i>roa</i>	0.005	0.020	0.001	-0.076	0.212
Sales growth	<i>sales_growth</i>	0.086	0.493	0.030	-0.910	6.903
% Independent director	<i>pct_indep</i>	0.194	0.323	0	0	1
Cash flow from operation	<i>cfo</i>	0.083	0.061	0.075	-0.229	0.346

Table 1 – Descriptive Statistics

Turning to the firm characteristics, the average natural logarithm of total assets is 22.91, and in Australian dollar amounts, that is roughly \$8.9 billion, which is not surprising since these firms are the ASX 100, the largest companies in Australia. The average book-to-market ratio is 0.626 and the average leverage ratio is 0.498. The profitability is not very high, at average 0.5% for ROA and annual sales growth of 8.6%. Cash flow from operation accounts

for 8% of total assets. The companies also appear reasonably well-governed, and on average, 20% of board members are independent directors.

Graphical Illustration of Key Findings with Summary Statistics

Before detailing into the technical results with full regression analyses, we present some rough findings using summary statistics in Figure 4. Hopefully, the main story will still be conveyed to the casual readers without bogging them down with too many statistical details. We first divide our sample into 4 quartiles (subsamples) based on their annual ethic scores. Those with the lowest annual ethics scores are grouped in Quartile 1 (the left-most bar) and those with the highest annual ethics scores are grouped in Quartile 4 (the far-right bar). This is presented on the horizontal axis. Then, for each of these quartiles, we calculate their average restatement (the percentage of firms in the group that report future financial restatement) and their average market reaction (the average first day market returns) and present these on the vertical axis.

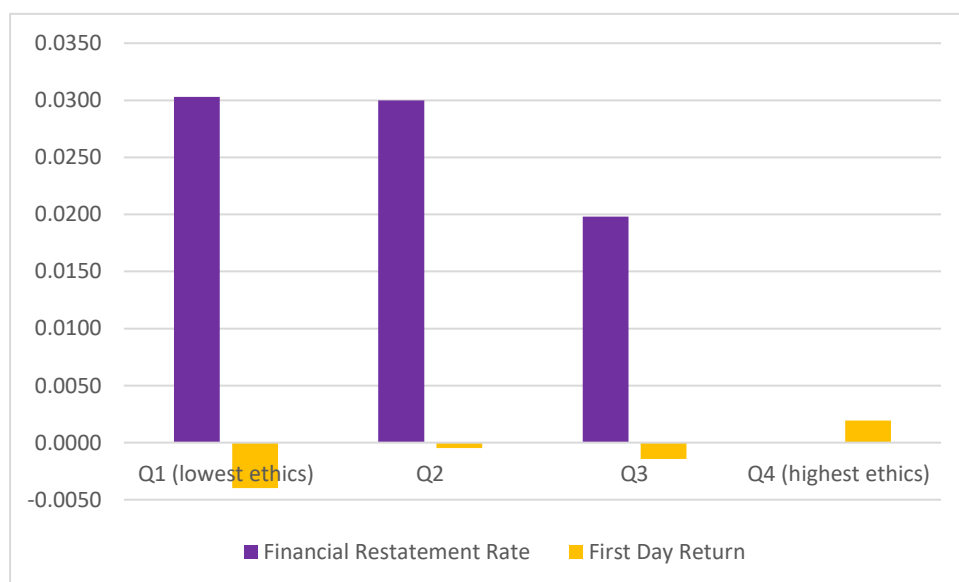


Figure 4 – Summary statistics on the relation between corporate ethics

The results, on the aggregate, show that there is an overall declining trend in financial restatement rate and an overall increase in market returns when the level of corporate ethics

becomes higher (from Quartile 1 to Quartile 4). This is in line with our conjecture that high corporate ethics improves the financial reporting quality and also investors' reaction.

Ethics and Financial Reporting Quality

Table 2 reports the results of testing the impact of corporate ethics on financial reporting quality, by regressing *restate* on the variables of interest (Equation 1).

VARIABLES	(1) <i>restate</i>	(2) <i>restate</i>
<i>ethics_score</i>	-0.427** (-2.165)	-0.445** (-2.064)
<i>assets</i>		-0.204 (-0.513)
<i>btm</i>		-1.133 (-0.457)
<i>leverage</i>		2.625 (0.935)
<i>roa</i>		-14.19 (-0.420)
<i>sales_growth</i>		-0.441 (-0.247)
<i>pct_indep</i>		2.507** (2.307)
<i>cfo</i>		-1.057 (-0.173)
Constant	-3.974*** (-10.50)	-1.182 (-0.138)
Observations	405	405
R-squared	0.045	0.160

Table 2 – The impact of corporate ethics on financial restatement⁵

In column 1, we only regress *restate* on *ethics_score*, and as expected, the coefficient estimate on *ethics_score* is -0.427, significantly negative at the 5% level. In column 2, we include the other control variables, and the coefficient estimate on *ethics_score* is -0.445, also significantly negative at the 5% level. The economic interpretation is that for every 1-point

⁵ In all tables, ***, **, * denote p-value <0.01, <0.05, and <0.1 (two-tailed).

increase in the ethics score of the company, the likelihood that the financial statement being restated will be reduced by almost 36% ($1 - e^{-0.445}$), which is significant. Overall, the empirical evidence appears to support our conjecture that organisations with better ethics level have lower likelihood of restating their financial statements and hence, possess better financial reporting quality.

Ethics and Investors' Reaction

Table 3 reports the results of testing the impact of corporate ethics on investors' reaction, by regressing *returns* on the variables of interest (Equation 2).

VARIABLES	(1) <i>returns</i>	(2) <i>returns</i>
<i>ethics_score</i>	0.002* (1.947)	0.002* (1.912)
<i>assets</i>		-0.001 (-0.551)
<i>btm</i>		0.001 (0.324)
<i>leverage</i>		-0.005 (-0.628)
<i>roa</i>		0.054 (0.881)
<i>sales_growth</i>		-0.004* (-1.731)
<i>pct_indep</i>		-0.001 (-0.170)
<i>cfo</i>		0.019 (0.975)
Constant	-0.001 (-1.131)	0.014 (0.550)
Observations	405	405
R-squared	0.009	0.026

Table 3 – The impact of corporate ethics on market returns

In column 1, we only regress *returns* on *ethics_score*, and as expected, the coefficient estimate on *ethics_score* is 0.002, significantly positive at the 10% level. In column 2, we

include the other control variables, and the coefficient estimate on *ethics_score* is also 0.002, also significantly positive at the 10% level. The economic interpretation is that for every 1-point increase in the ethics score of the company, the stock returns on the day of financial restatement release will be higher by 0.2%, which is significant given this is only a one-day stock return. Overall, the empirical evidence appears to support our conjecture that organisations with better ethics level elicit stronger reactions from the market.

Ethics, Financial Reporting Quality, Investors' Reaction – Mediation Analysis

Tables 2 and 3 document that corporate ethics have impact on both financial reporting quality and investors' reaction, but it does not provide direct evidence that investors' weak reactions are due to their beliefs in the low financial reporting quality of firms with low corporate ethics. To provide direct evidence on this, we follow Baron and Kenny (1986) and conduct a mediation analysis on the relationship among corporate ethics, financial reporting quality and investors' reaction. The test is done in three steps.

In step 1, we show that corporate ethics (the independent variable) can predict the investors' reaction (the dependent variable) and this is shown in Table 2. In step 2, we need to show that corporate ethics (the independent variable) can predict financial reporting quality (the mediator) and this is shown in Table 1. In the last step, both corporate ethics (the independent variable) and financial reporting quality (the mediator) are entered into the regression to explain investors' reaction (the dependent variable) and the coefficient estimate on the independent variable (corporate ethics) must be significantly reduced in the presence of the mediator (financial reporting quality). We report these coefficient estimates in Figure 5 below. The results support our conjecture that financial reporting quality mediates the relationship between corporate ethics and investors' reaction. Specifically, with the inclusion of financial reporting quality as the mediator, the coefficient estimate on corporate ethics

reduces significantly from 0.002 (significant at the 10% level) to 0.0016 (also significant at the 10% level). The proportion of total effect that is mediated is 20%, i.e., $(0.002 - 0.0016)/0.002$, which is rather significant.

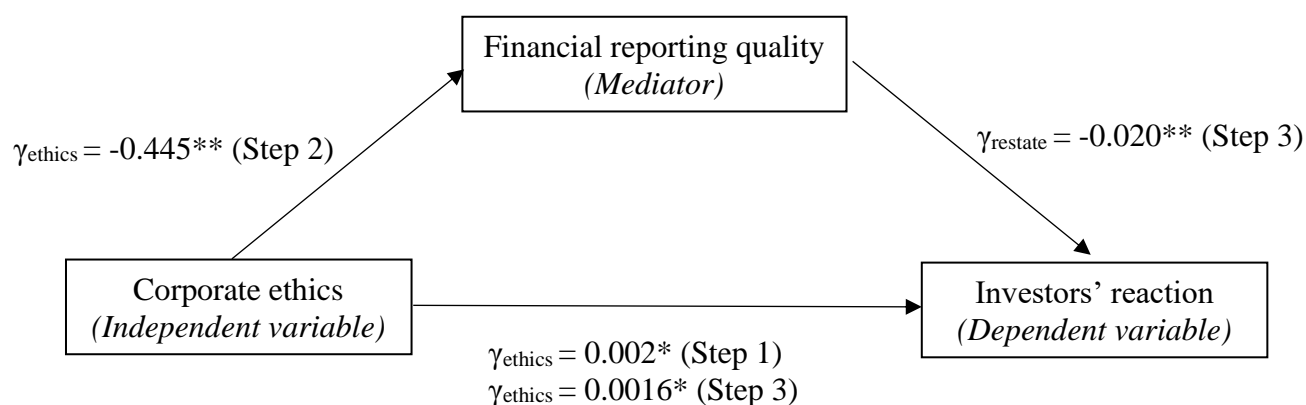


Figure 5 –Mediation analysis on the impact of corporate ethics on market returns through financial reporting quality

Additional Analyses

In our earlier tables, we use only one aggregate ethics score, by summing the scores on the both the “pros” and “cons” reviews. Prior research has indicated that negative reviews tend to contain more information, as employees are unlikely to say good things about a company generally. To investigate this bias, we use the raw ethics scores for “pros” and “cons” reviews separately in our regression analysis. As a refresher, “pros” reviews are scored between 0 and 10 and “cons” reviews are scored between -10 and 0, and in both cases, a more positive score represents better ethics. The results are reported in Table 4. As expected, we observe that the scores on “cons” reviews are more statistically significant than the scores on “pros” reviews.

VARIABLES	(1) <i>restate</i>	(2) <i>returns</i>
<i>ethics_pros_score</i>	-0.345 (-1.053)	0.00131 (1.349)
<i>ethics_cons_score</i>	-0.446** (-2.125)	0.002** (2.353)
<i>assets</i>	-0.237	-0.001

	(-0.590)	(-0.361)
<i>btm</i>	-1.056	0.001
	(-0.438)	(0.272)
<i>leverage</i>	2.533	-0.003
	(0.899)	(-0.382)
<i>roa</i>	-13.48	0.055
	(-0.399)	(0.895)
<i>sales_growth</i>	-0.396	-0.004*
	(-0.226)	(-1.781)
<i>pct_indep</i>	2.595**	-0.001
	(2.333)	(-0.390)
<i>cfo</i>	-1.219	0.022
	(-0.200)	(1.092)
Constant	-0.495	0.009
	(-0.057)	(0.358)
Observations	405	405
R-squared	0.162	0.030

Table 4 – The impact of corporate ethics, with separate scores for “pros” and “cons”

One concern that arises from the use of Glassdoor.com data is the timing of the reviews, or specifically, which financial periods these reviews relate to. For example, a former employee of a company might only post reviews about the company after the employee has safely switched to a new company, and this could be many months into the future. A review posted in February 2018 might actually relate to the company’s conditions back in September 2017. To address this timing concern, we experiment with using a longer window in measuring the ethics level of companies. That is, specifically, two-year window. For example, we regress the restatement likelihood and market returns of 2018, on the company ethics scores derived from all the reviews posted in 2017 and 2018. We report the results in Table 5, and observe stronger results using this longer window. For example, in Column 1, where the dependent variable is *restate*, the coefficient estimate on *ethics_score (2 years)* is -0.940, significant at the 5% level, compared to -0.445 in Table 2. In Column 1, where the dependent variable is *returns*, the coefficient estimate on *ethics_score (2 years)* is 0.003, significant at the 1% level, compared to 0.002 in Table 3.

VARIABLES	(1) <i>restate</i>	(2) <i>returns</i>
<i>ethics_score</i> (2 years)	-0.940** (-2.447)	0.003*** (2.839)
<i>assets</i>	-0.347 (-0.766)	-0.001 (-0.273)
<i>btm</i>	-1.409 (-0.427)	0.001 (1.124)
<i>leverage</i>	3.838 (1.238)	-0.004 (-0.600)
<i>roa</i>	-8.008 (-0.205)	-0.005 (-0.100)
<i>sales_growth</i>	-0.132 (-0.070)	-0.008** (-2.431)
<i>pct_indep</i>	2.202* (1.850)	-0.003 (-0.749)
<i>cfo</i>	-0.737 (-0.108)	0.026 (1.399)
Constant	1.433 (0.149)	0.006 (0.240)
Observations	344	344
R-squared	0.204	0.050

Table 5 – The impact of corporate ethics, using 2-year window for reviews

Overall, the various robustness tests conducted help to triangulate our main findings and give us confidence that our documented results on the link between corporate ethics and financial reporting quality is warranted.

Discussion

We set out on this research with the hope of attaining three research objectives (discussed on page 6)

Regarding the first objective, we manage to develop an AI algorithm that can read and score employees' reviews on Glassdoor.com to infer corporate ethics level. We first train the AI algorithm with 300 reviews and then use an additional 100 reviews for an out-of-sample test. As reported in Figure 3, our AI algorithm has very high accuracy, and the scores it assigns only differ about 7% from the actual scores, as assigned by human readers. However, we are unable to validate this to the actual ethics level in the organisation, as that requires data from the actual employees working in the organisation. We plan to do follow-up interviews with employees at ASX 100 firms, to see whether there is a consensus between Glassdoor.com reviews and what the employees actually feel working there, in order to better explore research objective 1.

Regarding the next two research objectives, we use the measures developed earlier and run regression analyses. The results are reported in Tables 2 and 3, and show that organisations with better ethics level have higher financial reporting quality, as well as higher market returns when the financial statements are issued, satisfying our research objectives.

Concluding Remarks

In this research project, we have developed a novel method to capture the ethics level of the financial reporting function of the ASX 100 firms using publicly accessible data. We have used our measure to investigate the impact of ethics on financial reporting quality and investors' reactions, and the empirical results are largely in line with our prediction. Hence, the three research objectives of this project have been satisfied.

We encourage other researchers to adopt our method and hopefully there will be more research into the importance of corporate ethics, given its emphasis by various codes of ethics published by professional accountancy bodies.

Lastly, we would also like to draw corporate managers' attention to what are being said about their companies on social media nowadays. It seems that employee reviews carry a lot of information about the companies they work for, and it is worth corporate managers paying close attention and learn from these reviews, so as to enhance their organisations.

Appendix – Variables Definition

Variable name	Definition
<i>restate</i>	An indicator variable equals to 1 if the financial statement for the firm is restated in the future (from SIRCA)
<i>returns</i>	Raw stock returns on the first day the financial statement is issued to the public (from SIRCA)
<i>ethics_score</i>	The annual ethics score of the company, derived using our AI algorithm that reads the employee reviews from Glassdoor.com, with higher values indicating higher organisational ethics
<i>assets</i>	The natural logarithm of the total assets (from SIRCA)
<i>btm</i>	The book to market ratio, computed as the book value of equity divided by the market value of the firm (from SIRCA)
<i>leverage</i>	The leverage ratio, computed as the value of liabilities divided by the total assets (from SIRCA)
<i>roa</i>	The return on assets, computed as the net profit divided by total assets (from SIRCA)
<i>sales_growth</i>	The annual sales growth, computed as the percentage change in annual sales growth (from SIRCA)
<i>pct_indep</i>	The percentage of directors in the board that are independent (from SIRCA)
<i>cfo</i>	The cash flow from operations, scaled by total assets (from SIRCA)

Abbreviations

Abbreviation	Full name
<i>AI</i>	Artificial Intelligence
<i>APESB</i>	Accounting Professional & Ethical Standards Board
<i>ASIC</i>	Australian Securities & Investments Commission
<i>ASX</i>	Australian Securities Exchange
<i>CPA</i>	Certified Practising Accountant
<i>FASEA</i>	Financial Adviser Standards and Ethics Authority
<i>GAAP</i>	Generally Accepted Accounting Principles
<i>IESBA</i>	International Ethics Standards Board for Accountants
<i>MSE</i>	Mean squared error
<i>NLP</i>	Natural language processing
<i>PAO</i>	Professional accountancy organisation
<i>SIRCA</i>	Securities Industry Research Centre of Asia-Pacific
<i>TSE</i>	Total squared error

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