Date:	12 November 2018
Document:	Final Report on External Grant
Grant:	AFAANZ 2017 Research Fund
Applicants:	Associate Professor Adrian Gepp (adgepp@bond.edu.au) and Associate Professor Bruce Vanstone (bvanston@bond.edu.au), Bond Business School, Bond University
Project Title:	Improving investment performance using automated fraud detection models
Funding:	$4,500
Expenditure:	$4,500 on research assistant work, as stated in application, to extract the key information from CapitalIQ and Bloomberg databases for the S&P500

Project Summary (original in italics)

The hypothesis is that investment performance is related to the likelihood of financial statement fraud. By calculating the investment performance of portfolios of stocks formed conditional on the output of an advanced financial statement fraud detection model, we can assess the size and direction of the relationship between fraud and investment performance. While the fraud detection modelling research has studied the accuracy of their models that can be used as decision aids, research has not yet studied whether fraud detection models can be used to increase investment performance.

Using an automated fraud detection model developed using modern data analytics, companies in the US S&P500 index were ranked according to their likelihood of having fraudulent financial statements. Two investment strategies were formed. The first invests in companies with low likelihood of such fraud, whereas the other invests in companies with a high likelihood. The key finding is that the former, the one investing in the less likely to be fraudulent firms, has a higher returns, lower risk (as measured by standard deviation) and a higher Sharpe ratio. Further, this strategy is also superior after accounting for the effect of the market with a positive alpha that is statistically significant at the 5% level.

Outcome

Gepp A., Yee, A., Vanstone, B. & Kumar, K. (2018) *The Financial Consequence of Integrity: Using Automated Fraud Detection for Investment* accepted for presentation at the Australasian Actuarial Education & Research Symposium 2018, Sydney, December 5.

Abstract: This paper investigates the financial consequence of integrity. We study how portfolio performance is affected by avoiding investing in companies that are more likely to have committed financial statement fraud. Using a fraud detection model built using data analytics, companies are ranked according to a score indicating their likelihood of being fraudulent. Two investment strategies are then formed. The first invests in companies with low fraud scores whereas the other invests in those with high scores. We find that investment performance can be improved, with higher returns and lower risk, by investing in companies less likely to have committed fraud in preference to those more likely. This suggests that the price of integrity is not high. Portfolio performance was not be financially damaged by excluding companies likely to have committed financial statement fraud and, in fact, benefited from doing so.

Future Intentions for this Project

We are currently in the final stages of drafting a manuscript that will be submitted to a journal before the end of 2018, probably before the end of November. The initial target journal is the Journal of Business Ethics (ABDC: ranked A; FT top 50) based on advice on a working paper version from mentor Professor Tom Smith (Macquarie University).

Being the first few investigation of a multivariate fraud model in an investment strategy, there is much scope for additional research such as testing whether the results hold for more sophisticated investment strategies and for non-US companies. We are keen to investigate these questions ourselves and are considering how to obtain funding to continue supporting our research in this area.

More broadly, this work is part of a broader research project titled *Fraud Detection and Prevention*, which is led by Dr Adrian Gepp (Bond), Prof Kuldeep Kumar (Bond) and Dr Sukanto Bhattacharya (Deakin). This research has contributed to that project and its findings will contribute to future research in the project, which includes, amongst other goals an ARC DECRA 2019 submission by Adrian Gepp.

Summary of Outcomes and Benefits

It is the first research to integrate a multivariate fraud model into an investment strategy. There is a substantial benefit to the fraud and investment literature with our finding that investors' portfolios will not be financially damaged from avoiding investment in companies likely to have committed financial statement fraud and, in fact, can benefit from doing so. The main beneficiaries of this research will be investors since they can utilise this information to increase their portfolio returns. Additionally, ethical investors will be interested to know that they will be financially rewarded for investing in firms less likely to have committed fraud. In December 2018, we will be disseminating this research at the conference stated above, which is a combined industry and academic conference. We chose this outlet being it means that investors and investment professionals can benefit from becoming aware of these findings, as well as academics.