

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

# **Three essays on corporate fraud in Chinese listed companies**

A thesis presented in fulfilment of the requirements for the degree  
of

Doctor of Philosophy

in

Finance

at Massey University

Palmerston North, New Zealand

**Yi Wei**

**2015**

Copyright is owned by the Author of this thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. This thesis may not be reproduced elsewhere without the permission of the Authors.

## ABSTRACT

---

This thesis investigates the detection, processes and capital market impact of corporate fraud in China. Three specific issues are researched in the Chinese context through three interconnected essays: the identification of fraudulent financial statements; the measurement of illegal tunnelling of company funds by controlling shareholders; the evaluation of the stock market response to the public exposure of firm fraud violations.

First, the link between accounting balance sheet values and the exposure of fraudulent activities in Chinese firms is investigated. Other receivables, inventories, prepaid expenses, employee benefits payables and long-term payables are found to be important indicators of fraudulent Chinese financial statements. The findings from previous studies that document asset accounts that are associated with fraudulent financial statements are confirmed, but previous evidence that overstates the value of total liabilities is challenged. A new model applied to all Chinese listed firms correctly predicts the absence of fraud approximately 81% of the time. Balance sheet accounting values scaled by total assets or sales are found to provide valuable information to predict fraudulent financial statements.

Next, valuable insights are provided into the factors and processes surrounding cash tunnelling, a form of embezzlement by controlling shareholders, in firms accused of fraud. The controlling shareholder's financial motivation for tunnelling is found to be negatively related to the percentage of shareholdings of the top owner, the profitability of the firm, and the costs of tunnelling. A new theoretical model of cash tunnelling is developed, through which the process of tunnelling in the Chinese market is revealed. The overall tunnelling loss in the sample of fraudulent firms is about 5.54 times that of net income.

Lastly, long-term market responses surrounding announcements of firm fraud are investigated. Although fraudulent firms are shown to display worse operating performance, lower dividends and higher other equity distributions than matching firms, long-term abnormal stock returns following the fraud announcements are insignificant. This is consistent with a view that stock market prices in China do not fully reflect the losses incurred by fraudulent firms and that in this regard, the stock market in China is not fully efficient.

## ACKNOWLEDGEMENTS

---

First and foremost, I would like to express my sincere gratitude to my supervisors, Dr. Jianguo Chen, Associate Professor Jing Chi, and Dr. Carolyn Wirth for the continuous support throughout the PhD journey. I have been fortunate to work with my supervisors and I am deeply grateful to them for their expertise, understanding, encouragement, and patience, which added considerably to my PhD experience.

I wish to thank Massey University for offering me the Doctoral Scholarship to pursue my doctoral degree. I am also thankful to Fong Mee Chin for helping me with accessing databases, to Cameron Rhodes for his technical assistance, to Maryke Bublitz and Kim Williams for their administrative supports. I am also grateful to everyone in the School of Economics and Finance for their various forms of support along the course of the study.

I would like to extend my appreciation to participants and discussants for their valuable feedback, insightful comments and suggestions at Financial Management Association (FMA) Asian 2014 held in Tokyo, Japan; New Zealand Finance Colloquium (NZFC) 2014 held in Auckland University of Technology; the 4th Auckland Finance Meeting 2014 held at AUT Business School, Auckland; Massey Business School 2014 PhD Symposium; New Zealand Finance Colloquium (NZFC) 2015 held at the University of Waikato, Hamilton; School of Economics and Finance Seminar series at Massey University, Palmerston North (2015); at Nanjing Agricultural University, China (2015); and at Inner Mongolia Agricultural University, China (2013).

Many thanks to my dear friends and my PhD mates who have helped me overcome setbacks and stay focused on my PhD study. I truly value their friendship and I deeply appreciate their belief in me.

Most importantly, none of this would have been possible without the love and patience of my family. I would like to thank my parents for their love and unconditional support throughout this journey. I sincerely appreciate my parents-in-law for their spiritual support in all aspects of my life. My heart-felt gratitude to my dear husband Feng Ke for his unflinching support, continued and unfailing love throughout this endeavour.

# TABLE OF CONTENTS

---

|  |            |
|--|------------|
| <b>ABSTRACT</b> .....  | <b>iii</b> |
| <b>ACKNOWLEDGEMENTS</b> .....  | <b>iv</b>  |
| <b>TABLE OF CONTENTS</b> .....   | <b>v</b>   |
| <b>LIST OF TABLES</b> .....  | <b>ix</b>  |
| <b>LIST OF FIGURES</b> .....   | <b>xii</b> |
| <b>CHAPTER ONE: INTRODUCTION</b> .....                                   | <b>1</b>   |
| 1.1 Introduction .....   | 2          |
| 1.2 Background and motivation.....                                       | 3          |
| 1.3 Research aims .....  | 6          |
| 1.4 Contributions of the research.....                                   | 10         |
| 1.5 Research outputs from the thesis .....                               | 12         |
| 1.6 Structure of the thesis .....  | 13         |
| <b>CHAPTER TWO: OVERARCHING LITERATURE REVIEW</b> .....                  | <b>15</b>  |
| 2.1 Institutional background .....                                       | 16         |
| 2.1.1 Overview of China’s capital markets .....                          | 16         |
| 2.1.2 Stock markets .....  | 17         |
| 2.1.3 Chinese accounting and financial reporting practices .....         | 20         |
| 2.1.4 Fraudulent financial statement (FFS) and regulatory agencies ..... | 25         |
| 2.1.5 Conclusion.....  | 30         |
| 2.2 Corporate governance .....   | 31         |
| 2.2.1 Internal governance .....  | 32         |
| 2.2.1.1 Ownership structure .....  | 32         |
| 2.2.1.1.1 Different types of ownership .....                             | 32         |
| 2.2.1.1.2 The 2005 split share reform .....                              | 34         |
| 2.2.1.1.3 Ownership concentration .....                                  | 36         |
| 2.2.1.2 Board structure.....   | 39         |
| 2.2.1.2.1 Board of directors .....                                       | 39         |
| 2.2.1.2.2 Supervisory boards.....  | 41         |
| 2.2.1.2.3 Audit committees .....   | 42         |
| 2.2.2 External governance .....  | 44         |

|   |    |
|---|----|
| 2.2.2.1 Institutional investors.....                            | 44 |
| 2.2.2.2 Auditor quality.....                                    | 45 |
| 2.2.2.3 Debt disciplines (bank monitoring).....                 | 47 |
| 2.2.2.4 Takeover markets.....                                   | 50 |
| 2.2.2.5 Product market competition.....                         | 51 |
| 2.2.3 Conclusion.....   | 52 |
| 2.3 The economics of FFS.....                                   | 53 |
| 2.3.1 Country level attributes.....                             | 54 |
| 2.3.1.1 Information transparency.....                           | 54 |
| 2.3.1.2 Legal environment.....                                  | 55 |
| 2.3.1.3 Economic conditions.....                                | 56 |
| 2.3.1.4 Regulatory framework.....                               | 57 |
| 2.3.2 Firm level attributes.....                                | 59 |
| 2.3.2.1 Corporate governance.....                               | 59 |
| 2.3.2.2 Firm-level risk.....                                    | 64 |
| 2.3.2.3 How to measure tunnelling.....                          | 64 |
| 2.3.3 Consequences of related party transactions and fraud..... | 68 |
| 2.3.4 Conclusion.....   | 69 |

**CHAPTER THREE: ESSAY ONE: DETECTING FRAUD IN CHINESE LISTED COMPANIES USING BALANCE SHEET ACCOUNTING VALUES.....71**

|   |     |
|---|-----|
| 3.1 Introduction.....                                 | 73  |
| 3.2 Literature Review and hypothesis development..... | 78  |
| 3.3 Sample and methodology.....                       | 84  |
| 3.4 Empirical results.....                            | 93  |
| 3.5 Robustness tests.....                             | 104 |
| 3.6 Conclusion.....                                   | 110 |

**CHAPTER FOUR: ESSAY TWO: CASH TUNNELLING IN CHINESE FIRMS .....114**

|   |     |
|---|-----|
| 4.1 Introduction.....   | 116 |
| 4.2 Theoretical model.....  | 121 |
| 4.3 Hypothesis development.....   | 128 |
| 4.3.1 Cost of fraudulent financial statements and propensity for fraud..... | 128 |
| 4.3.2 Profitability condition and propensity for fraud.....                 | 132 |
| 4.4 Research design.....  | 135 |
| 4.4.1 Sample description.....   | 135 |
| 4.4.2 Control firms.....  | 138 |

|   |            |
|---|------------|
| 4.4.3 Identification of accounts related to tunnelling .....  | 138        |
| 4.4.3.1 Soft accounts .....   | 138        |
| 4.4.3.2 Solid accounts .....  | 140        |
| 4.4.3.3 Cost accounts .....   | 140        |
| 4.4.4 Univariate tests .....  | 142        |
| 4.5 Multivariate tests .....  | 145        |
| 4.5.1 Determinants of the change of other receivables ( $\Delta OREC$ ) .....   | 145        |
| 4.5.2 Robustness checks when variables are deflated by sales.....   | 152        |
| 4.5.3 Robustness tests when earnings management is controlled.....  | 153        |
| 4.5.4 The proxy of tunnelling in the form of impairment losses .....  | 155        |
| 4.5.5 Comparison between fraudulent firms and matching firms.....   | 158        |
| 4.5.6 Characteristics of tunnelling firms.....  | 159        |
| 4.6 Conclusion .....  | 166        |
| <br>  |            |
| <b>CHAPTER FIVE: ESSAY THREE: LONG-TERM STOCK PRICE AND<br/>ACCOUNTING PERFORMANCE OF FRAUDULENT FIRMS IN CHINA .....</b> | <b>169</b> |
| 5.1 Introduction .....  | 171        |
| 5.2 Literature review and hypotheses development.....   | 174        |
| 5.3 Sample, methodology and empirical results .....   | 180        |
| 5.3.1 Short-term abnormal stock returns .....   | 181        |
| 5.3.2 The change in firm operating performance surrounding fraud events.....  | 185        |
| 5.3.3 Long-term accounting performance of fraudulent and matching firms around fraud<br>events.....                       | 186        |
| 5.3.4 Long-term abnormal stock returns.....   | 188        |
| 5.3.4.1 Consequences of fraudulent activities.....  | 188        |
| 5.3.4.1.1 Buy-and-hold abnormal returns .....   | 190        |
| 5.3.4.1.2 Calendar time abnormal returns approach .....   | 195        |
| 5.3.4.2 Consequences of fraudulent activities—robustness check .....  | 198        |
| 5.3.5 The relationship between operating performance and stock price performance .....                                    | 201        |
| 5.3.6 Effect of enforcement actions and firm performance .....  | 203        |
| 5.3.7 Other potential explanations for stock performance.....   | 206        |
| 5.4 Conclusion .....  | 211        |
| <br>  |            |
| <b>CHAPTER SIX: CONCLUSION .....</b>  | <b>213</b> |
| 6.1 Review of hypotheses, major findings and implications .....   | 214        |
| 6.1.1 Essay One: Detecting fraud in Chinese listed companies using balance sheet<br>accounting values .....               | 215        |

|  |            |
|--|------------|
| 6.1.2 Essay Two: Cash tunnelling in Chinese firms .....  | 217        |
| 6.1.3 Essay Three: Long-term stock price and accounting performance of fraudulent firms<br>in China .....  | 218        |
| 6.2 Limitations of the thesis and future areas of research.....  | 219        |
| <b>LIST OF TABLES: CHAPTER THREE: ESSAY ONE: DETECTING FRAUD IN<br/>CHINESE LISTED COMPANIES USING BALANCE SHEET ACCOUNTING<br/>VALUES .....</b>           | <b>222</b> |
| <b>LIST OF TABLES AND FIGURES: CHAPTER FOUR: ESSAY TWO: CASH<br/>TUNNELLING IN CHINESE FIRMS .....</b>   | <b>240</b> |
| <b>LIST OF TABLES AND FIGURES: CHAPTER FIVE: ESSAY THREE: LONG-<br/>TERM STOCK PRICE AND ACCOUNTING PERFORMANCE OF<br/>FRAUDULENT FIRMS IN CHINA .....</b> | <b>286</b> |
| <b>Reference List.....</b>   | <b>317</b> |
| <b>APPENDIX A: ESSAY ONE: DETECTING FRAUD IN CHINESE LISTED<br/>COMPANIES USING BALANCE SHEET ACCOUNTING VALUES.....</b>                                   | <b>331</b> |
| Appendix A.1: Examples of the violation types .....  | 331        |
| Appendix A.2: Weighted probit regression results.....  | 334        |
| Appendix A.3: Probit regression results of balance sheet account values (scaled by sales) on<br>corporate fraud indicator.....                             | 339        |
| Appendix A.4: An example of the spurious relationship.....   | 340        |
| <b>APPENDIX B: ESSAY TWO: CASH TUNNELLING IN CHINESE FIRMS.....</b>  | <b>341</b> |
| Appendix B.1: Torch Automobile: A typical fraudulent case .....  | 341        |
| Appendix B.2: enforcement action process .....   | 341        |
| Appendix B.3: From the view of event year.....   | 342        |
| B.3.1 Soft accounts.....   | 342        |
| B.3.2 Solid accounts .....   | 345        |
| B.3.3 Cost accounts .....  | 347        |
| B.3.4 Measuring the level of overstated amounts in identified accounts after adjustment<br>based on matching firms.....                                    | 350        |
| Appendix B.4: Variable definitions.....  | 354        |
| Appendix B.5: Regulations of tunnelling .....  | 354        |
| Appendix B.6: The approximate total losses .....   | 355        |
| Appendix B.7: Robustness tests in three typical violation types .....  | 356        |
| Appendix B.8: Robustness tests in the determinants of other receivables .....  | 359        |
| Appendix B.9: Robustness tests in the determinants of impairment losses.....   | 361        |

## LIST OF TABLES

---

|  |     |
|--|-----|
| Table 3.1 Empirical studies.....   | 223 |
| Table 3.2 Sample description of fraud .....  | 225 |
| Table 3.3 Descriptive statistics and mean comparison between fraud and matching firms<br>.....   | 228 |
| Table 3.4 Indicators of multicollinearity and OLS regression results .....   | 229 |
| Table 3.5 Probit regression results of balance sheet account values (scaled by total<br>assets) on corporate fraud indicator .....   | 231 |
| Table 3.6 Probit regression results of different types of fraud violations and balance<br>sheet accounts .....   | 234 |
| Table 3.7 Probit regression results of balance sheet account values on corporate fraud<br>indicator – Robustness checks .....  | 236 |
| Table 3.8 Correct predictions of fraudulent and non-fraudulent firms .....   | 238 |
| Table 3.9 Probit regression results of balance sheet accounts, corporate ownership,<br>board structure, and firm specific information on corporate fraud.....                      | 239 |
| Table 4.1 Descriptive statistics for regulatory enforcements.....  | 241 |
| Table 4.2 Comparison of fraudulent firms and matching firms.....   | 244 |
| Table 4.3 Correlation matrix of explanatory variables to explain the tunnelling process<br>.....   | 250 |
| Table 4.4 OLS regression results of changes in other receivables on other operating<br>costs and net cash flows (total assets version).....  | 252 |
| Table 4.5 OLS regression linking other operating costs, net cash flows, change of some<br>controlling variables to the change in other receivables (total assets version)<br>..... | 253 |
| Table 4.6 OLS regression results of change in other receivables on other operating costs<br>and net cash flows (sales version).....  | 257 |
| Table 4.7 OLS regression linking other operating costs, net cash flows, change of some<br>controlling variables to the change in other receivables (sales version).....            | 258 |
| Table 4.8 OLS regression results of change in other receivables on other operating costs<br>and net cash flows when earnings management is controlled .....                        | 262 |
| Table 4.9 OLS regression linking other operating costs, net cash flows, change of some<br>controlling variables to the impairment losses (total assets version).....               | 263 |

|   |     |
|---|-----|
| Table 4.10 OLS regression linking other operating costs, net cash flows, change of some controlling variables to the impairment losses (sales version)..... | 267 |
| Table 4.11 OLS regression results of change in other receivables in both fraud and matched sample.....  | 271 |
| Table 4.12 OLS regression results of the determinants of other receivables (OREC) .   | 274 |
| Table 4.13 OLS regression results of the determinants of impairment losses (Impairment) .....   | 276 |
| Table 5.1 Cumulative abnormal returns around the enforcement announcements in the short run .....   | 287 |
| Table 5.2 Determinants of CARs .....  | 288 |
| Table 5.3 Changes in operating performance of fraudulent firms .....  | 290 |
| Table 5.4 Financial performance--before event and post event.....   | 291 |
| Table 5.5 Cumulative abnormal returns around the enforcement announcements in the long run—buy and hold abnormal returns approaches .....                   | 292 |
| Table 5.6 Cumulative abnormal returns around enforcement announcements in the long run—calendar time abnormal returns .....                                 | 297 |
| Table 5.7 Cumulative abnormal returns--Robustness test .....  | 301 |
| Table 5.8 The relationship between stock performance and other receivables .....  | 302 |
| Table 5.9 Cross-sectional regressions of post-event stock returns on operating performance .....  | 303 |
| Table 5.10 The effects of enforcement actions from the CSRC on fraudulent firms ...   | 304 |
| Table 5.11 Cumulative and mean net income, dividend and grey accounts in both fraud and matched samples .....   | 307 |
| Table A.2.1 Weighted probit regression results of balance sheet account values on corporate fraud indicator.....  | 334 |
| Table A.2.2 Probability cutoffs that minimize the expected costs of misclassification   | 336 |
| Table A.2.3 Weighted probit regression results of balance sheet account values (scaled by sales) on corporate fraud indicator.....                          | 337 |
| Table A.3.1 Out-of-sample prediction .....  | 339 |
| Table B.3.4.1 Overstated balances of operating expenses and non-operating expenses in fraudulent firms.....   | 350 |
| Table B.3.4.2 Overstated percentage of operating expenses and non-operating expenses in fraudulent firms .....  | 351 |
| Table B.6.1 Annual loss in fraud sample .....   | 355 |
| Table B.6.2 Annual loss in matched sample .....   | 355 |

|  |     |
|--|-----|
| Table B.7.1 OLS regression results of change in other receivables in three different fraudulent types..... | 356 |
| Table B.8.1 OLS regression results of the determinants of other receivables (OREC)                         | 359 |
| Table B.9.1 OLS regression results of the determinants of impairment losses (Impairment) .....             | 361 |

## LIST OF FIGURES

---

|   |     |
|---|-----|
| Figure 4.1: The differences between fraudulent and matching firms in some soft balance sheet accounts .....                     | 278 |
| Figure 4.2: The differences between fraudulent and matching firms in some solid balance sheet accounts .....                    | 279 |
| Figure 4.3: The differences between fraudulent firms and matching firms in operating revenue.....                               | 280 |
| Figure 4.4: The differences between fraudulent and matching firms in some income statement accounts .....                       | 281 |
| Figure 4.5: The differences between fraudulent firms and matching firms in non-operating income and non-operating expenses..... | 282 |
| Figure 4.6: The relationship between TopRatio and OREC .....  | 283 |
| Figure 4.7: The relationship between TopRatio and Size.....   | 284 |
| Figure 4.8: The relationship between TopRatio and impairment .....  | 285 |
| Figure 5.1 Cumulative risk adjusted abnormal returns (CRAARs).....  | 308 |
| Figure 5.2 Cumulative market adjusted abnormal returns (CMAARs).....  | 310 |
| Figure 5.3 Monthly cumulative abnormal returns—buy and hold abnormal returns approaches .....                                   | 312 |
| Figure 5.4 The differences between fraudulent and matching firms in selected accounts from Equation 20 .....                    | 316 |
| Figure B.3.1.1 The differences between fraudulent firms and matching firms in some soft balance sheet accounts .....            | 344 |
| Figure B.3.2.1 The differences between fraudulent firms and matching firms in a set of solid accounts.....                      | 346 |
| Figure B.3.3.1 The differences between fraudulent firms and matching firms in operating revenue.....                            | 348 |
| Figure B.3.3.2 The differences between fraudulent firms and matching firms in other-operating costs .....                       | 348 |
| Figure B.3.4.1 The adjustment based on matching firms in a set of other-operating costs .....                                   | 352 |