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Underlying earnings reporting quality, equity overvaluation, and disclosure of intellectual capital: Australian evidence

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**Underlying earnings reporting quality, equity overvaluation, and
disclosure of intellectual capital: Australian evidence**

A thesis submitted in fulfilment of the requirements for the
award of the degree of

Doctor of Philosophy

From

University of Wollongong

By Yiru Yang

School of Accounting, Economics and Finance

2016

Thesis Certification

I, Yiru Yang, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in School of Accounting, Economics and Finance, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Yiru Yang

21 June 2016

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Abstract

In 2005, Australia changed its accounting standards from the Australian General Accepted Accounting Principles to International Financial Reporting Standards. This change raised concerns that introducing a fair-value model to measure various assets can introduce greater variability in earnings in financial statements due to unrealised earnings emerging from these measurements (e.g., Chalmers et al., 2008; 2011; Clarkson et al., 2011; Goodwin et al., 2008a); this resulted in measures of financial performance that are difficult to analyse (IASB & FASB, 2008). In response, firms are reporting alternative non-statutory earnings identified as ‘underlying earnings’ where ‘underlying earnings’ are deemed to be a better measure of firms’ underlying economic performance to supplement statutory earnings. Firms do this to reflect their ongoing business activities and help investors understand their ‘actual’ economic performance.

This thesis consists of three papers that are consistent with a thesis prepared for publication. The three papers examine the underlying earnings reporting quality and its relationship to equity overvaluation and intellectual capital reporting based on a sample of Australian Securities Exchange (ASX) 200 listed firms from year 2009 to year 2012. Since there is no existing empirical evidence to investigate whether managers disclose underlying earnings to help investors evaluate the ‘true value’ of a firm, or opportunistically to influence investors’ perceptions of firm performance to mislead them, the first paper examines underlying earnings reporting behaviour by managers and how the market reacts to such behaviour. Two types of reporting behaviour are tested in the first paper: efficient reporting based on signalling theory and opportunistic reporting based on prospect theory and agency theory.

Efficient reporting is investigated by the relationship between earnings persistence and the likelihood of underlying earnings reporting, and the relationship between earnings predictability and the likelihood of underlying earnings reporting. Opportunistic reporting is examined by the likelihood of managers using opportunistic income-increasing underlying earnings exclusions when firms miss their statutory earnings target or make current statutory losses. The results confirm the opportunistic reporting hypothesis that when firms do not meet earnings targets or make current statutory losses, managers are more likely to use income-increasing underlying earnings exclusions to make underlying earnings look greater than statutory earnings. Specifically, managers opportunistically exclude recurring expenses to make underlying earnings look better than statutory earnings, and categorise such recurring expenses as ‘Other’ unspecific expenses so there is less chance of them being detected. This suggests that income-increasing underlying earnings exclusions represent inappropriate classification of the earnings components, but investors are misled by this opportunistic reporting behaviour because they perceive current statutory earnings to be irrelevant and react favourably to underlying earnings.

Based on the finding of the first paper that managers report underlying earnings opportunistically to increase the stock prices, the second paper examines whether overvalued firms engage in earnings management and whether the duration of overvaluation is an important determinant of their decision to use accruals earnings management and opportunistic underlying earnings reporting based on the agency theory of overvalued equity. According to this theory, when a firm’s stock price becomes overvalued, the potential for conflicts of interest between owners and managers grows. Here, managers of overvalued firms not only refuse any market correction of overvalued stock prices, but they actually tend to extend overvaluation by engaging in different earnings management techniques that increase reported earnings. Therefore, equity overvaluation induces managers to engage in

alternative earnings management techniques in order to maintain this upward trend in stock prices (Jensen, 2005). The second paper shows evidence consistent with this reasoning, finding that overvalued firms are more likely to disclose underlying earnings and report them opportunistically for the whole sample period. Considering how the duration of overvalued equity influences managers' choices of earnings management, the results suggest that managers engage in accruals earnings management at an early stage, and as overvaluation continues, they are more likely to disclose underlying earnings opportunistically.

The argument in the first and second papers indicates that reporting opportunistic underlying earnings is an earnings management technique that is difficult for investors to detect, whereas the third paper assumes that the level of intellectual capital disclosure may be a better way to detect opportunistic underlying earnings reporting. The reasoning here is based on signalling theory and resource-based theory, whereby high reporting quality firms that gain a competitive advantage from more unique resources are more likely to disclose intellectual capital because it represents the inimitable and non-replaceable resources that enhance their performance, whereas low reporting quality firms with less intellectual capital would find it difficult to disclose sufficient intellectual capital because it is hard to imitate. As a market valuation incentive, low reporting quality firms would engage in opportunistic underlying earnings reporting to influence investors' perceptions. Based on the premise that firms engage in opportunistic underlying earnings because they have no more intellectual capital to disclose, the third paper examines whether firms engaging in opportunistic underlying earnings have difficulty in disclosing the inimitable intellectual capital. The third paper also examines whether disclosing intellectual capital representing the inimitable and non-substitutable resources of a firm can reflect the firm's current and future financial performance, and whether signalling resources to investors is relevant to firm valuation. Paper three proves that intellectual capital signals firms' future economic benefits, which are

value-relevant for decision-making and carry future benefits forward to current stock returns. Specifically, intellectual capital disclosure and sufficient intellectual capital disclosure are positively and significantly related to a firm's current and future financial performance (i.e., they are positively and significantly related to current and future return on equity ratios, return on assets ratios, revenue growth ratios, and revenue-to-assets ratios); in fact, sufficient intellectual capital disclosure is significantly and positively associated with the amount of future earnings reflected in the current stock returns. In addition, paper three confirms the hypothesis that low quality firms are less likely to voluntarily disclose intellectual capital, as intellectual capital disclosures and sufficient intellectual capital disclosures are negatively related to opportunistic underlying earnings reporting. The results of the third paper, combined with those of the first and second papers, suggest that low quality firms are less likely to disclose intellectual capital because it is a difficult signal to imitate, so they use opportunistic underlying earnings reporting to influence investors' perception of firm performance to increase and maintain their stock prices.

The three papers make several significant contributions to the extant literature. Paper one makes three major contributions. First, prior research in the United States of America provides mixed results about how managers report non-statutory earnings (e.g., Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Bhattacharya et al., 2003; Doyle et al., 2003; Johnson & Schwartz, 2005), so the paper one contributes to existing debates about non-statutory earnings reporting by examining the way managers report underlying earnings and market reactions to underlying earnings reporting in the Australia context. Second, only a few studies have examined how managers report non-statutory earnings based on theories, so paper one developed research hypotheses based on signalling theory, prospect theory, and agency theory. Signalling theory is used to test the efficient underlying earnings reporting hypothesis, whereas prospect theory and agency theory are used to examine the opportunistic

underlying earnings reporting hypothesis. Third, paper one contributes to the policy debate surrounding the usefulness of underlying earnings for users such as investors or creditors. Australian Institute of Company Directors support firms' reporting underlying earnings as an alternative performance measurement (AICD & FINSIA, 2009), but the Australian Securities & Investments Commission is concerned that underlying earnings is information that may mislead investors (ASIC, March, December 2011). Paper one contributes to these debates by stating that underlying earnings are opportunistically manipulated by managers when they do not meet earnings targets, or make current statutory losses.

The second paper contributes to the literature on equity overvaluation and earnings management by examining whether overvalued equity firms engage in earnings management and whether managers alternate between accruals earnings management and opportunistic underlying earnings reporting to sustain the overvaluation. There are three papers in the extant literature that have examined the association between opportunistic non-statutory earnings disclosure (pro forma earnings) with within-statutory earnings management techniques (accruals earnings management and/or real activities earnings management) (Black et al., 2014; Doyle et al., 2013; Elshafie et al., 2010). All three papers found that managers alternate between within-statutory earnings management and opportunistic non-statutory earnings disclosure, but these three papers did not examine whether the duration of equity overvaluation motivates managers to use different earnings management tools alternatively. Second, while previous studies have examined the relationship between pro forma earnings and accruals earnings management using the absolute value of accruals earnings management, paper two examines the absolute value of accruals earnings management and also whether managers use income-increasing accruals earnings management and income-increasing underlying earnings exclusions alternatively. Third,

paper two empirically tests Jensen's (2005) agency theory of overvalued equity. Badertscher (2011) examined overvaluation and manager's choice of non-statutory earnings management and found that overvalued firms are more likely to engage in non-statutory earnings management than firms that are not overvalued. However, Badertscher (2011) defined non-statutory earnings management as firms that identified restatement announcements that raised questions about the quality of financial reporting. It is not clear whether managers use opportunistic non-statutory earnings disclosure as an earnings management tool to substitute for other earnings management tools to sustain overvalued equity. Paper two extends Badertscher's (2011) study by investigating how the duration of overvalued equity influences managers to use accruals earnings management and opportunistic underlying earnings reporting. Fourth, Zang (2012) examined the role of earnings management costs in managers' decisions to trade off different earnings management tools. Paper two extends Zang's study by examining whether the constrained abilities of managers using accruals earnings management and income-increasing accruals earnings management influence their decision to transit into underlying earnings disclosure and disclose these underlying earnings opportunistically in order to sustain overvalued equity.

The third paper makes several contributions to existing literature on intellectual capital disclosure and earnings management. First, none of that literature looked at whether firms with earnings management are less likely to disclose intellectual capital. Paper three is the first to examine the relationship between earnings management and intellectual capital disclosure, and suggests that firms with earnings management find it hard to disclose intellectual capital because it is difficult to imitate and replace. Second, studies examining whether intellectual capital disclosure can demonstrate to investors the value-relevant information that took place during the reporting period, or value-creation for the future are

rare (Abeysekera, 2011, p. 20). Paper three is the first study in Australia to examine whether intellectual capital disclosure can enhance current and future financial performance, and whether disclosing intellectual capital through annual reports is value-relevant to investors' decision making, using content analysis for a large sample of Australian listed firms. Third, Abeysekera (2006) observed that the development of a theoretical framework underlying intellectual capital disclosure is in its infancy, with few studies providing a strong theoretical basis for interpreting their findings; in fact, research on intellectual capital underpinned by signalling theory is extremely limited (Li et al., 2008). Paper three has built a theoretical framework grounded on resource-based theory and signalling theory to develop research hypotheses.

The findings of this thesis can have positive implications for the development of accounting standards and practices in Australia. As this thesis finds that managers report underlying earnings opportunistically to mislead investors and sustain overvalued equity, these findings provide useful insights for corporate regulators such as the Australian Securities & Investments Commission, who presently oppose firms' publishing underlying earnings, so that they can make an empirically valid decision for further action. It may prove useful for investors to have a better understanding of how managers exercise the discretion inherent within accounting standards and outside accounting standards alternatively, to mask poor firm performance or to sustain the overvalued stock prices. Findings are also useful to those who use intellectual capital to assess the quality of a firm (such as creditors and investors) because findings confirm that low quality firms are unlikely to disclose sufficient intellectual capital.

Table of Contents

CHAPTER ONE Introduction and Overview.....	1
1.1 Changes to Australian Accounting Standards	2
1.2 Motivation and purpose for this research	4
1.3 Data and methods	5
1.4 Overview of subsequent Chapters.....	7
CHAPTER TWO Underlying earnings reporting and the market reactions	8
2.1 Introduction.....	9
2.2 Literature review	13
2.2.1 Underlying earnings.....	13
2.2.2 Non-statutory earnings reporting behaviour	15
2.2.2.1 Evidence of efficient reporting	15
2.2.2.2 Evidence of opportunistic reporting.....	17
2.2.2.3 Evidence of co-existing reporting.....	20
2.2.3 Market reactions to non-statutory earnings reporting.....	22
2.2.4 Regulatory response on non-statutory earnings	24
2.2.4.1 Regulation in the United States	24
2.2.4.2 Regulation in the Australia	26
2.2.4.3 Regulation in the international.....	27
2.3 Theoretical framework and development of hypotheses.....	27
2.3.1 Signalling theory	28
2.3.1.1 Definition of signalling theory.....	28
2.3.1.2 Key concepts of signalling theory	28
2.3.1.3 Applications of signalling theory in the literature	30
2.3.2 Development of efficient reporting hypothesis.....	32
2.3.3 Prospect theory.....	35
2.3.3.1 Definition of prospect theory	35
2.3.3.2 Key concepts of prospect theory.....	36
2.3.3.3 Applications of prospect theory in literature	38
2.3.4 Agency theory.....	40
2.3.4.1 Definition of agency theory	40
2.3.4.2 Key concepts of agency theory	40
2.3.4.3 Applications of prospect theory and agency theory in literature	42
2.3.5 Development of opportunistic reporting hypothesis.....	45
2.3.6 Market reactions to underlying earnings reporting	48
2.4 Research design.....	48
2.4.1 Data and sample selection.....	48
2.4.2 Testing efficient reporting (H1)	51
2.4.2.1 Earnings persistence	51
2.4.2.2 Earnings predictability	52
2.4.2.3 Empirical model for testing H1	53
2.4.3 Testing opportunistic reporting (H2, H3a & H3b).....	54
2.4.3.1 Persistence of income-increasing underlying earnings exclusions (H2)	54
2.4.3.2 Earnings target, earnings losses, and underlying earnings reporting (H3a&H3b).....	56

2.4.4 Control variables for efficient and opportunistic reporting	57
2.4.5 Testing market reactions (H4)	61
2.5 Analyses and results.....	64
2.5.1 Status of current underlying earnings reporting.....	64
2.5.2 Descriptive statistics of variables for paper one	67
2.5.3 Pearson and Spearman correlations of variables for paper one	72
2.5.4 Regression results	76
2.5.4.1 Results for efficient reporting (H1).....	76
2.5.4.2 Results for opportunistic reporting (H2, H3a & H3b)	77
2.5.4.3 Results for market reactions (H4)	82
2.6 Additional tests.....	84
2.7 Summary of chapter two	87
CHAPTER THREE Equity overvaluation and managers' choices of using alternative earnings management mechanisms.....	89
3.1 Introduction.....	90
3.2 Literature review	93
3.2.1 The definition of earnings management	93
3.2.2 The motivations for opportunistic earnings management.....	96
3.2.3 Managers' decisions on using multiple earnings management mechanisms.....	100
3.2.3.1 Substitution association	102
3.2.3.2 Complementary association	105
3.3 Theoretical framework and development of hypotheses.....	106
3.3.1 Definition of agency theory of overvalued equity	106
3.3.2 Key concepts of agency theory of overvalued equity	107
3.3.3 Application of agency theory of overvaluation in literature	108
3.3.4 Development of hypotheses	110
3.4 Research design.....	114
3.4.1 Measurement of accruals earnings management	114
3.4.2 Measurement of equity overvaluation	117
3.4.3 Empirical models for testing H5 & H6	119
3.4.4 Control variables for equity overvaluation and earnings management	120
3.4.5 Limited ability using accruals earnings management (H7)	123
3.5 Analyses and Results.....	124
3.5.1 Descriptive statistics of variables for paper two	124
3.5.2 Pearson and Spearman correlations and factor analysis of variables for paper two.....	126
3.5.3 Regression results	129
3.5.3.1 Results for overvalued firms induce earnings management (H5).....	129
3.5.3.2 Results for the duration of overvaluation and earnings management mechanisms (H6).....	133
3.5.3.3 Results for limited ability using accruals earnings management (H7)	137
3.6 Additional tests.....	140
3.6.1 Alternative measurement of equity overvaluation	140
3.6.2 Alternative accruals earnings management measurements.....	145
3.6.2.1 Dechow & Dichev's (2002) model with a 10-year rolling window	146
3.6.2.2 Modified Jones model.....	149

3.7 Summary of chapter three	153
CHAPTER FOUR Intellectual capital disclosure and opportunistic underlying earnings reporting.....	154
4.1 Introduction.....	155
4.2 Literature review	158
4.2.1 Definition of IC.....	158
4.2.2 Measurement of IC	159
4.2.2.1 ROA measurement.....	159
4.2.2.2 MCM measurement	160
4.2.2.3 VAIC TM measurement	162
4.2.2.4 COB measurement	163
4.2.2.5 The advantages and disadvantages of each measurement	166
4.2.3 IC and firm's financial performance	168
4.2.4 Value relevance of IC	170
4.2.5 IC in Australia.....	173
4.2.5.1 Development of IC in Australia.....	173
4.2.5.2 The IC and financial performance in Australia.....	175
4.3 Theoretical framework and development of hypotheses.....	176
4.3.1 Resource-based theory	176
4.3.1.1 Definition of resource-based theory	176
4.3.1.2 Key concepts of resource-based theory	177
4.3.1.3 Application of resource-based theory in the literature.....	178
4.3.2 Signalling theory and voluntary IC disclosure.....	180
4.3.3 Application of signalling theory in IC literature	182
4.3.4 Development of hypotheses	183
4.4 Research design.....	186
4.4.1 IC data capture	186
4.4.1.1 Content analysis	186
4.4.1.2 Threats to the validity and reliability of the content analysis	190
4.4.1.3 Overcoming threats to content analysis	190
4.4.2 Empirical models	192
4.4.2.1 IC and firm's financial performance (H8)	192
4.4.2.2 Control variables for financial performance	194
4.4.2.3 Value relevance of IC (H9).....	196
4.4.2.4 Control variables for value relevance of IC.....	200
4.4.2.5 IC and opportunistic underlying earnings reporting (H10).....	200
4.5 Analyses and Results.....	201
4.5.1 Descriptive statistics of variables for paper three	201
4.5.2 Frequency of reporting specific IC attributes	202
4.5.3 Relative emphasis in terms of IC categories	205
4.5.4 Pearson and Spearman correlations of variables for paper three	206
4.5.4.1 Pearson and Spearman correlations for three individual IC categories	206
4.5.4.2 Pearson and Spearman correlations for financial performance variables	208
4.5.5 Results for IC and financial performance (H8).....	213
4.5.6 Results for value relevance of IC (H9)	224
4.5.7 Results for IC and opportunistic underlying earnings reporting (H10)	227
4.6 Additional tests.....	228

4.6.1 IC and market valuation (H9)	228
4.6.2 Results for value relevance of three individual IC categories	232
4.6.3 Results for three individual IC categories and opportunistic underlying earnings reporting	235
4.7 Summary of chapter four	240
CHAPTER FIVE Concluding remarks	242
5.1 Aims and results of this thesis	243
5.2 Contributions	245
5.3 Main limitations of the research and suggestions for future research	249
Bibliography	251
Appendices	291
Appendix 1: Literature review summaries	291
Appendix 1.1: Literature review summary for paper one (Non-statutory reporting and market reactions)	291
Appendix 1.2: Literature review summary for paper two (Managers' decisions on using multiple earnings management mechanisms)	298
Appendix 1.3: Literature review summary for paper three (The impacts of IC on firm's financial performance and market valuation)	304
Appendix 2: Underlying earnings reporting adjustments, impacts of underlying earnings on statutory earnings, and underlying earnings reporting locations	310
Appendix 3: IC items definitions and examples	321

List of tables

Table 1: Sample selection	50
Table 2: Industry distribution.....	50
Table 3: Descriptive statistics for underlying reporting and market reaction variables.....	70
Table 4: Pearson and Spearman correlations for opportunistic and efficient hypotheses variables	74
Table 5: Regression results for efficient reporting (H1)	77
Table 6: Regression results for persistence of adjustments (H2)	80
Table 7: Regression results for opportunistic reporting (H3a & H3b).....	82
Table 8: Regression results for market reactions (H4).....	83
Table 9: Newey-West test for persistence of adjustments (H2).....	86
Table 10: Newey-West test for market reactions (H4)	87
Table 11: Descriptive statistics for earnings management and equity overvaluation variables.....	126
Table 12: Pearson and Spearman correlations for earnings management and equity overvaluation variables and factor analysis for equity overvaluation variables	128
Table 13: Regression results for equity overvaluation and earnings management (H5)	131
Table 14: Regression results for during of equity overvaluation and managers' choices of using alternative earnings management (H6)	135
Table 15: Regression results for limited ability of using accruals earnings management (H7).....	138
Table 16: Regression results for using alternative overvaluation measure (H6)	143
Table 17: Pearson and spearman correlations for accruals earnings management variables	145
Table 18: Regression results for using 10 year-rolling window of Dechow & Dichev's (2002) model (H6).....	147
Table 19: Regression results for using modified Jones model (H6)	151
Table 20: Advantages and disadvantages of different IC measurements.....	167
Table 21: Descriptive statistics for IC and its three categories	202
Table 22: The frequency counts of individual IC items.....	204
Table 23: The relations between IC and its three categories	207
Table 24: Pearson and spearman correlations for financial performance measurements	209
Table 25: Regression results for IC and firm's profitability (H8)	215
Table 26: Regression results for IC and firm's productivity (H8).....	222
Table 27: Regression results for value relevance of IC (H9).....	226
Table 28: Regression results for IC and opportunistic underlying earnings reporting (H10).....	228
Table 29: Regression results for value relevance of IC with MtoB as the dependent variable (H9) ..	230
Table 30: Regression results for value relevance of three individual IC categories as the independent variables (H9).....	233
Table 31: Regression results for three individual IC categories disclosures and opportunistic underlying earnings reporting (H10).....	237

List of Figures

Figure 1: Key concepts of signalling theory	28
Figure 2: Flow chart of theoretical framework for efficient underlying earnings reporting based on signalling theory.....	34
Figure 3: Flow chart of theoretical framework for opportunistic underlying earnings reporting based on prospect theory and agency theory.....	46
Figure 4: Underlying earnings adjustments	65
Figure 5: Impacts of underlying earnings on statutory earnings	66
Figure 6: Locations of underlying earnings reporting.....	67
Figure 7: Flow chart of theoretical framework for IC reporting and opportunistic underlying earnings reporting based on signalling theory and resource-based theory	186
Figure 8: The relative emphasis in terms of IC categories.....	206

List of Abbreviations

AASB	Australian Accounting Standards Board
AGAAP	Australian General Accepted Accounting Principles
AICD	Australian Institute of Company Directors
AICRS	Austrian Intellectual Capital Research Centre
AIMR	Association for Investment Management Research
ASIC	Australian Securities & Investments Commission
ASX	Australian Securities Exchange
ATO	Revenue to Assets ratio
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CGU	Cash Generating Unit
COB	Components-based Intellectual Capital measurement
DIC	Direct Intellectual Capital measurement
EBIT	Earnings before Interest and Tax
EBITDA	Earnings before Interest, Tax, Depreciation and Amortization
EPS	Earnings per Share
FASB	Financial Accounting Standards Board
FINSIA	Financial Services Institute of Australasia

FROE	Future Return on Equity
GAAP	Generally Accepted Accounting Principles
GICS	Global Industry Classification Standard
HPRs	Holding Period Returns
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IC	Intellectual Capital
IFRS	International Financial Reporting Standards
IPO	Initial Public Offering
MCM	Market-based Intellectual Capital measurement
OLS	Ordinary Least Squares
P/B	Price-to-Book ratio
P/E	Price-to-Earnings ratio
P/V	Price-to-Value ratio
PEG	Price-Earnings-Growth ratio
PPE	Property, Plant and Equipment
R&D	Research & Development
Reg G	Regulation G
RG	Revenue growth

ROA	Return on Assets
ROE	Return on Equity
SC	Scorecard Intellectual Capital measurement
SEC	Securities and Exchange Commission
SEOs	Seasoned Equity Offerings
SFAC	Statement of Financial Accounting Concepts
SOX	Sarbanes-Oxley Act
TVC TM	Total Value Creation model
VAIC TM	Value Added Intellectual Coefficient measurement

CHAPTER ONE Introduction and Overview

1.1 Changes to Australian Accounting Standards

On the first of January 2005, Australia became the first country in the world to adopt the International Financial Reporting Standards (IFRS), as formulated by the International Accounting Standards Board (IASB). While the Australian Accounting Standards Board (AASB) had been converging the Australian General Accepted Accounting Principles (AGAAP) with IFRS, the mandatory adoption of IFRS moved accounting standards towards the introduction of fair value as a preferred basis for measuring assets while recognising unrealised gains and losses through changes in the fair value of assets reported in the income statements, along with extensive disclosures to explain them (Australian Institute of Company Directors (AICD) and Financial Services Institute of Australasia (FINSIA), 2009). The adoption of IFRS by Australia changed accountancy practices for intangible assets, goodwill, financial and taxation instruments, share-based payments, and the impairment of non-current assets (see, Chalmers et al., 2008; 2011; Haswell & Langfield-Smith, 2008). IFRS-led earnings are considered to be high quality because they represent a series of the best accounting practices in the world and are claimed to be more capital-market-oriented than many domestic accounting standards due to the adoption of a fair value measurement basis (Ding et al., 2007). Moreover, IFRS has enhanced the quality of information and the compatibility of financial reporting by promoting a uniform set of accounting standards across the globe (Jeanjean & Stolowy, 2008). Consequently, the adoption of IFRS could decrease costs for investors when comparing firms from different markets and nations to boost international investment and integrate capital markets (Covrig et al., 2007).

There are some doubts that the globalised usage of IFRS could lead to more comparable and informative financial reporting. Studies argue that regulatory, cultural, and political differences across countries may not be adequately reflected in a single set of standards

because the professional judgements of accounting standards are influenced by such contextual factors (e.g., Ali & Hwang, 2000; Ball, 2006; Burgstahler & Eames, 2006; Holthausen, 2009; Lang et al., 2006). According to former Securities and Exchange Commission (SEC) Chairman Pitt, limiting reporting practices to a single set of accounting standards cannot capture the significant aspects of a firm and nation-specific performance, and furthermore, it also complicates comprehension for users across the globe because they have little knowledge about how contextual factors influence the application of accounting standards (Pitt, 2001). Literature also cited that IFRS should not be used to measure the underlying performance of firms because using the IFRS fair-value model to measure various assets can introduce greater variability in earnings in financial statements due to unrealised earnings emerging from such measurement that are then reported in financial statements by firms (e.g., Chalmers et al., 2008; 2011; Clarkson et al., 2011; Goodwin et al., 2008a). Researchers acknowledged that Australian firms were not prepared for the transition to IFRS (e.g., Chua et al., 2012; Goodwin et al., 2008b; Jones & Higgins, 2006). From a regulatory perspective, the IASB and Financial Accounting Standards Board (FASB) in the U.S. acknowledged that including unrealised gains and losses through changes in the fair value of assets in income statements has undermined projecting the underlying economic reality of firms, and resulted in measures of financial performance that are difficult to analyse (IASB & FASB, 2008). In response to this dissatisfaction with statutory earnings, firms have begun to report an alternative non-statutory earnings identified as ‘underlying earnings’ where they assert that ‘underlying earnings’ is a better measure of their underlying economic performance to supplement statutory earnings, in order to accurately reflect the ongoing business activities of reporting firms and help investors better understand the ‘actual’ economic performance of firms.

1.2 Motivation and purpose for this research

This thesis presents its material in the form of three papers that are consistent with a thesis prepared for publication. The three papers examine the underlying earnings reporting quality and its relationship to equity overvaluation and the reporting of intellectual capital by Australian Securities Exchange (ASX) 200 listed firms. Since there is no empirical evidence to investigate whether managers disclose underlying earnings in a way that helps investors to evaluate the ‘true value’ of a firm, or in an opportunistic way that influences investors’ perceptions of firms performance to mislead them, the first paper in this thesis attempts to examine the underlying earnings reporting behaviour by managers (either efficient or opportunistic) and how the market reacts to these underlying earnings. If managers disclose underlying earnings opportunistically to induce investors’ perceptions of firm performance such that they overvalue the stock price, then the question is, do managers use underlying earnings reporting opportunistically to substitute other types of earnings management to sustain equity overvaluation? Based on the first paper, that managers report underlying earnings opportunistically to increase the stock price, the second paper attempts to examine how the duration of equity overvaluation affects management’s use of opportunistic underlying earnings reporting and accruals earnings management. Specifically, do managers engage in accruals earnings management at the early stage of equity overvaluation and then disclose underlying earnings opportunistically to sustain overvaluation at later stages of overvaluation due to a limited ability to use accruals earnings management? Revealing opportunistic underlying earnings may be problematic to some investors because opportunistic underlying earnings are more likely to go undetected as they are not externally audited. From the argument of the first and second papers that reporting opportunistic underlying earnings are difficult for investors to detect, the third paper in this thesis assumes that the level of intellectual capital (IC) disclosure may be a better way to detect opportunistic

underlying earnings reporting. The reasoning behind this is based on signalling theory and resource-based theory where the high reporting quality firms that gain a competitive advantage from more unique resources are more likely to disclose IC because it represents the inimitable and non-replaceable resources that enhances their performance, whereas low reporting quality firms with less IC would find it difficult to disclose sufficient IC because it is hard to imitate. As a market valuation incentive, low reporting quality firms would engage in opportunistic underlying earnings reporting to influence investor's perceptions. The third paper of this thesis examines whether disclosing IC representing the inimitable and non-substitutable resources of a firm can reflect their current and future financial performance and whether signalling resources to investors are relevant to firms' valuation. More importantly, the third paper examines whether firms engaging in opportunistic underlying earnings have difficulty in disclosing the inimitable IC. This is on the basis that firms engage in opportunistic underlying earnings because they have no more IC to disclose.

1.3 Data and methods

This thesis uses ASX 200 listed firms as a sampling frame to identify firms that report underlying earnings and IC from years 2009 to 2012. The underlying earnings data were collected from the annual reports of sample firms, but to do so meant searching the annual reports available on Annual Reports Online database and DatAnalysis database by typing in the keywords 'underlying', 'adjusted', 'normalised', 'earnings before', 'profit before', and 'pro forma'. Following Black & Christensen (2009), this thesis does not include earnings before interest and tax (EBIT) or earnings before interest, tax, depreciation and amortization

(EBITDA), because they are commonly reported as standard steps in the income statement¹. This thesis also excluded firms involved in banking, insurance, diversified financials, and real estate because they are subjected to different reporting requirements. Moreover, firms without annual reports and financial information available on the database between year 2009 and year 2012 were also deleted. These actions reduced the sample size from 800 to 610 firm-year observations. To capture IC information, this thesis applied a content analysis for 610 annual reports. To analyse the IC content disclosed in the annual reports, the frequency of IC items reported was counted. The coding framework recorded data from the content analysis using 33 pre-defined IC items. The detailed underlying earnings data capture and IC data capture are discussed in section 2.4.1 and section 4.4.1 respectively.

This thesis used the panel data that meets the cross-sectional firms observed, and at least once more over the observed years from 2009 to 2012. The Ordinary Least Squares (OLS) technique on panel data may not be optimal because it omits the observed variability of a given firm over time, unduly influencing the predictor variables (Verbeek, 2004). Two ways of improving the estimation were suggested under the panel data setting, i.e., fixed-effects and random-effects regression models. The fixed-effects models assume that the unobserved attributes of a given firm over time will remain constant as the intercept of a given firm remains constant over time. The random-effects models assume that the unobservable attributes of a given firm change over time because each firm can have different intercepts across the years. The variability of intercepts of a given firm varies randomly and is included as part of the error term (Kennedy 2008, p.284). Borenstein et al. (2009, p. 85) summarised the major discrepancies between fixed-effects model and random-effects model by arguing that a fixed-effects model estimates a single effect that is assumed to be specific to the

¹ The EBIT and EBITDA are required to report in Profit & Loss financial statement for ASX listed firms.

sample firms because the unobserved variance is within-the-study (sampling or estimation) error. The random-effects model estimates the mean of effects distribution and the model of random-effects because it includes unobserved variance within the study and unobserved variance between studies. Kennedy (2008, p.290) asserts that the fixed-effects estimator is better with selection bias problems because the findings are specific to the sample being observed. Therefore, the fixed-effects regression models are used in this thesis. Detailed information about the fixed-effects variables is discussed in the research design section of each paper.

1.4 Overview of subsequent Chapters

The following chapters contain the three papers of this thesis and an overall conclusion. **Chapter 2** is paper one that examines management underlying earnings reporting behaviour and the influence of underlying earnings on market reactions. **Chapter 3** is paper two that investigates the relationship between equity overvaluation and managers use alternative earnings management mechanisms that consider underlying earnings to be an earnings management tool used by firms. **Chapter 4** is paper three to explore the relationship between the disclosure of intellectual capital and management opportunistically reporting on underlying earnings. Each paper follows the same structure: section one introduces the paper; section two provides literature reviews; section three explains the theoretical framework and development of hypotheses; section four describes the research design; section five presents the analyses and results of each paper, including the descriptive statistics, pearson and spearman correlations, and the results of regressions; section six provides the additional tests; and section seven is a summary of each paper. The final chapter (**Chapter 5**) provides the overall conclusion of this thesis.

CHAPTER TWO Underlying earnings reporting and the market reactions

This paper is in preparation for publication. I, Yiru Yang, declare that this paper is wholly my own work unless otherwise referenced or acknowledged.

Yiru Yang

21 June 2016

2.1 Introduction

As discussed in the introduction and overview chapter (i.e., chapter one), empirical studies provide mixed evidence about the influence of IFRS on the quality of financial reporting. By considering that the quality of financial reporting reflects the true underlying financial performance of firms, some studies provide evidence which supports that IFRS has increased the quality of financial reporting (e.g., Jeanjean & Stolowy, 2008; Covrig et al., 2007), while other studies provide evidence suggesting that IFRS has either decreased it or had no influence (e.g., Ali & Hwang, 2000; Ball, 2006; Burgstahler & Eames, 2006; Holthausen, 2009; Lang et al., 2006). Some firms suspect that changes achieved through IFRS standards have enhanced the reflection that firms reporting on their underlying performance are now more understandable, more comparable, more reliable, and contain more relevant information (Sloan & Bradshaw, 2002; Doyle et al., 2003).

In response, some firms are now reporting non-statutory earnings that are identified as ‘underlying earnings’; indeed firms assert that underlying earnings is a better measure of their underlying economic performance because it accurately reflects their ongoing business activities and helps investors better understand their ‘core’ economic performance.

Reporting non-statutory earnings has been a common phenomenon across countries in recent decades, starting in 1998 in the U.S., and then spreading worldwide (Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Doyle et al., 2003). Non-statutory earnings reported by managers in the U.S. are commonly known as pro forma earnings that stand for alternate and unaudited measures of firm performance that are called ‘recurring earnings,’ ‘core earnings,’ or ‘adjusted earnings’. Pro forma earnings represent recurring cash-related earnings where such computations exclude non-recurring or non-cash items that would otherwise be included under the Generally Accepted Accounting Principles (GAAP) earnings

determination. Firms argue that these non-recurring and non-cash items might not reflect their underlying financial performance (Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Bhattacharya et al., 2004), while managers consider that pro forma earnings could help investors make better decisions because they report on firms' cash-related recurring economic performance (Albring et al., 2010; Collins et al., 2009). Pro forma earnings reported by firms have received considerable attention by researchers, although previous research has revealed mixed results about managers' pro forma earnings reporting. Some researchers found that managers who efficiently reported pro forma earnings helped investors to improve decision making with information that is more relevant to them in ascertaining firms' valuation (e.g., Bhattacharya et al., 2003; Bradshaw & Sloan, 2002; Collins et al., 2009; Brown & Sivakumar, 2003). Other researchers have found that managers opportunistically report pro forma earnings to obtain personal economic benefits, such as meeting earnings targets set for them, or to unduly influence investors' perception about firms' performance (e.g., Doyle et al., 2003; 2013; Johnson & Schwartz 2005; Black & Christensen, 2009).

The notion of underlying earnings in this thesis is similar to those pro forma earnings made in the U.S., but with some distinct differences. From a similarity perspective, managers assert that non-statutory earnings are measurements of ongoing business activities that more accurately reflect their 'core' or 'recurring' economic performance. Pro forma earnings and underlying earnings are voluntarily reported by managers, but they are not part of an external financial audit that reviews the preparation of statutory financial statements. From a regulatory and reporting perspective, underlying earnings and pro forma earnings have several differences. Firstly, adjustments excluded from pro forma earnings made by U.S. firms differ from the adjustments excluded from underlying earnings made by Australian firms. The main adjustments made by U.S. firms are: stock based compensation costs, tax and

interest effects, merger and acquisition costs, research and development costs that are written off, depreciation and amortisation costs, gains or losses on asset dispositions, and other unspecific adjustments (Bhattacharya et al., 2003; Bhattacharya et al., 2004; Black & Christensen, 2009). The common adjustments excluded from underlying earnings in Australia are: impairment or/and revaluation of assets, purchase or/and disposal of assets and business, restructuring costs, and other unspecific adjustments (Deloitte, 2010; KPMG, 2009). Secondly, the main sectors reporting on pro forma earnings in U.S. differ from the main sectors reporting on underlying earnings in Australia. Pro forma reporters are heavily concentrated in the service and high-tech industries in U.S. (Bhattacharya et al., 2003; Black & Christensen, 2009; Johnson & Schwartz, 2005; Lougee & Marquardt, 2004; Marques, 2006), whereas in Australia, the financial sector, and the industrial and materials sectors are more frequently reporters who report on underlying earnings (Deloitte, 2010; KPMG, 2009). Thirdly, unlike the U.S., there is no compulsory regulation to regulate manager's reporting on non-statutory earnings in Australian firms because reporting on underlying earnings in the Australian context is 'principle-based' rather than 'rule-based'. Fourthly, compared to their U.S. counterparts, analysts do not follow Australian firms intensively (Habib & Hossain, 2008; Cheung et al., 2010) and institutional investors from Australia are unlikely to utilise their voting power to influence managerial behaviour (Craswell et al., 1997; Matolcsy & Wright, 2007; Wilson & Wang, 2010). These differences in regulatory and reporting environments may lead to different reporting behaviour of management non-statutory earnings between Australian and U.S. firms.

Most literature regarding managers' reporting of non-statutory earnings is carried out in the U.S., so there is no empirical evidence that managers' underlying earnings reporting has been examined, or how the market reacts to such reporting in Australia. The aim of this paper is to examine the behaviour of managers' reporting on underlying earnings. Based on signalling

theory, this paper argues that managers efficiently report underlying earnings to signal firms' underlying economic performance to help investors better understand their recurring economic performance when the statutory earnings fail to do so. Based on prospect theory and agency theory, this paper investigates whether managers' opportunistically report underlying earnings that is higher than statutory earnings when their firms do not meet earnings targets or makes current statutory losses. After examining the behaviour of management reporting on underlying earnings, this paper examines how investors react to this reporting.

The findings of this paper show that managers disclose underlying earnings opportunistically, such that when their firms fail to meet statutory earnings target or make current statutory losses, they are more likely to use income-increasing underlying earnings exclusions to define underlying earnings so that they are higher than statutory earnings. Higher underlying earnings can therefore influence investors' perceptions on firms' performance. These exclusions of income-increasing underlying earnings are managed to exclude recurring expenses that are relevant to future operating earnings rather than non-recurring and non-relevant expenses from statutory earnings to define underlying earnings that are higher than statutory earnings. These recurring expenses are categorised as 'other' unspecified expenses that are less likely to be detected by investors. The market reactions show that investors perceive current statutory earnings are value-irrelevant and react favourably to underlying earnings, which suggests that investors are misled by managers' opportunistically reporting on their underlying earnings.

The remaining sections are organised as follows: Section 2.2 examines the relevant literature; Section 2.3 presents the theoretical framework and hypotheses developed in this study;

Section 2.4 discusses the research design; Section 2.5 presents the data analyses and regression results; Section 2.6 presents the additional tests for this study, and Section 2.7 presents the conclusion.

2.2 Literature review

2.2.1 Underlying earnings

‘Underlying earnings’ are calculated based on the judgment of the preparer that reflect the ‘core’/‘recurring’ business activities of reporting firms. They are voluntarily reported earnings on a basis other than IFRS or in line with IFRS and then adjusted by firm managers (AICD & FINSIA, 2009). Firms use labels to describe underlying earnings, including ‘pro forma earnings’, ‘normalised earnings’, ‘underlying EBIT’, ‘underlying EBITDA’, ‘earnings before exceptional items’, ‘result excluding exceptional items’, ‘results before non-recurring items’, ‘results before significant items’, ‘results before special items’, ‘results before specific items’, ‘adjusted earnings before interest, tax, depreciation and amortisation’ or ‘adjusted operating earnings’ (Ernst & Young, 2007; AICD & FINSIA, 2009). The underlying earnings used in this thesis represent all such terms because they provide an alternative to statutory earnings. Although there is no general agreement about computing underlying earnings, significant non-recurring items and IFRS-driven unrealised gains and losses are excluded (AICD & FINSIA, 2009).

The adoption of underlying earnings is not an uncommon phenomenon in Australian firms because Woodside Petroleum Limited’s 2012 annual report documented that ‘underlying net profit after tax was \$2,061 million, a 25% increase on the 2011 figure’ (p.4); another example is where Boral Limited documented a net statutory loss at \$91 million, while underlying

profit after tax was a positive \$132 million in its 2010 annual report (p.23), and Rio Tinto Limited reported their underlying earnings in the performance highlights section of their 2012 annual report. Indeed, it documented that underlying earnings in 2012 decreased by US\$5.3 billion to US\$9.3 billion compared with 2011. A study conducted by KPMG in 2009 found evidence that 84% of firms on the ASX 100 index presented underlying earnings as a response to growing dissatisfaction with the statutory earnings representative of firms' actual economic performance (KPMG, 2009). In 2012, 32 out of 50 ASX index firms chose to report results using underlying earnings of economic performance in addition to statutory earnings (KPMG, 2013). In a study conducted by FINSIA in 2005 that interviewed 24 analysts, over 80% agreed that a constant and separate disclosure of underlying earnings would be a more useful measure of firm performance (FINSIA, 2005).

Recently, investors focused more on underlying earnings rather than conventional statutory earnings because underlying earnings are considered as proxy for a firm's ongoing profitability, an approach that is useful for evaluation (KPMG, 2009; AICD & FINSIA, 2009). There is ample evidence to support the fact that underlying earnings increases a firm's share price. As an example, on 21st of April 2014, shares in AMP limited increased by 42c or 9.3 per cent, to \$4.92 with investors warming to the underlying result, a result that beat the consensus forecast of \$833m (Gluyas, 2014).

In terms of the impact of underlying earnings on statutory earnings, Deloitte's (2010) study found that 52% of ASX 100 firms reported underlying earnings higher than their statutory earnings in year 2009. Twenty five per cent of the ASX 100 index firms reported underlying earnings in black (positive earnings) when the statutory earnings were reported in red (negative earnings). Moreover, 27% of ASX 100 index firms reported underlying earnings in the front of their annual reports while clearly explaining the differences between underlying

and statutory earnings. This highlights the importance placed on reporting underlying earnings by firms.

2.2.2 Non-statutory earnings reporting behaviour

Studies have examined whether managerial discretion of reporting non-statutory earnings helps investors to more accurately ascertain the underlying economic reality (efficient reporting behaviour) or perpetuates managers' own interests (opportunistic reporting behaviour). This paper provides evidence for both reporting behaviours in the following sections.

2.2.2.1 Evidence of efficient reporting

The range of arguments highlights the potential benefits of non-statutory earnings reporting made by managers. Bradshaw & Sloan (2002) compared the value relevance of street earnings² made by an analyst as proxy for a manager made pro forma earnings with the value relevance of GAAP earnings. The authors found that the earnings response coefficients and regression R squares were much higher for street earnings than GAAP earnings, which suggests that investors perceived that street earnings are more relevant. Moreover, the author's documented that a large portion of significant expenses excluded from street earnings are non-recurring expenses. Brown & Sivakumar (2003) extended Bradshaw & Sloan (2002)'s study by investigating three qualitative attributes of street earnings; the capacity to forecast future earnings (predictive ability), correlating earnings with stock prices (valuation), and associating earnings with abnormal stock returns (information content). The

² Street earnings are made by firms' analysts. The numbers of street earnings are announced by firms in their press releases and tracked by analyst estimate clearinghouse services such as I/B/E/S, Zacks, and First Call. Similarly, with pro forma earnings made by managers, certain exclusions (e.g., non-recurring expenses, non-cash items) are excluded to increase the predictive ability of earnings for future performance. Some studies use street earnings as a proxy for pro forma earnings (e.g., Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003).

authors find that street earnings are a better measure of predictive ability, valuation, and information content than GAAP earnings. Both of these studies arrived at conclusions by using street earnings that are available on analysts tracking services (e.g., I/B/E/S, First Call, Zacks), as proxies for pro forma earnings. However, Bhattacharya et al. (2003) believe that adjustments made by managers in computing pro forma earnings differ from adjustments made by analysts in computing street earnings. Bhattacharya et al. (2003) study investigated whether pro forma earnings reported by managers are more persistent (the earnings will be closer to 'core earnings' that are likely to continue in future periods) and informative (the earnings associate with short-window abnormal stock returns) than GAAP operating earnings. The results indicated that pro forma earnings are much more informative and persistent than GAAP operating earnings, implying that market participants consider that pro forma earnings represent 'core earnings' better than GAAP operating earnings. Bowen et al. (2005) examined the determinants where the emphasis was placed on pro forma earnings and GAAP earnings metrics, and also examined stock market reactions to such an emphasis using archival data. They find that when GAAP earnings are less relevant to investors for decision-making, the incremental information of pro forma earnings was enhanced with greater emphasis on this metric. The results also suggested that manager's report pro forma earnings to help investors ascertain market firm evaluations. Collins et al. (2009) used abnormal-return volatility, abnormal returns, and abnormal trading volume around quarterly-earnings announcement dates to examine the usefulness of pro forma earnings reports, and found that market participants increasingly relied on pro forma earnings for their stock pricing decisions because abnormal behaviour was associated with pro forma earnings. Albring et al. (2010) examined whether reported pro forma earnings were more relevant than computed operating earnings based on GAAP, using the stock prices model and stock returns model. The results showed that pro forma earnings were strongly associated with stock prices and stock returns,

suggesting that pro forma earnings are much more relevant to investors than the GAAP measure. Choi et al. (2007) investigated the specific sources of disagreement between analyst and management regarding the components of non-statutory earnings in the U.K. context. They found that most management-specific adjustments made by managers to define non-statutory earnings were more useful to increase the persistence aspect of non-statutory earnings than the specific adjustments made by analysts. This suggests that management-specific adjustments to statutory earnings showed managers' superior knowledge of the persistence aspect of earnings components.

Collectively, according to the above studies, non-statutory earnings are more persistent and better at predicting firms' future economic performance. Managers tend to report non-statutory earnings using the information available to them to make the non-statutory earnings more relevant (correlation of earnings of with the stock prices), informative (association of earnings with abnormal stock returns), and predictive (to forecast earnings in the future). Therefore these arguments support that managers efficiently report the non-statutory to increase the quality of financial reporting.

2.2.2.2 Evidence of opportunistic reporting

Empirical evidence to date does not provide clear evidence with regards to the motives for reporting non-statutory earnings, while another stream of research finds that managers tend to report non-statutory earnings higher than statutory earnings opportunistically in order to influence capital market expectations and valuations.

Doyle et al. (2003) investigated the persistent exclusions managers make when calculating pro forma earnings and discovered that the expenses excluded from pro forma earnings were

not value-irrelevant to future cash flows but useful for determine future cash flows. The market, however, perceives pro forma earnings as relevant when earnings are announced but if they are reported opportunistically then investors find them in the following year; this suggests that pro forma earnings influence market judgment at the time of reporting. Johnson & Schwartz (2005) applied the between-samples design to compare the characteristics of firms that report pro forma and those that don't, using hand-collected data, and found no evidence that GAAP operating earnings per share (EPS) are less persistent in pro forma than non-pro forma firms. The narrow-window stock returns tests revealed no evidence of a stock return premium for pro forma firms at the quarterly earnings announcement date. Collectively, although the findings do question managers' assertions that reporting pro forma earnings is meant to help investors assess firm performance, however, investors may not be misled by pro forma earnings disclosures. Entwistle et al. (2006) examined the wording used for pro forma reporting to determine whether the language used in press releases could mislead investors, and found more than 10% of all the American S&P 500 firms misleadingly reported pro forma earnings using traditional GAAP terminology. They used traditional GAAP language (such as net income) in the headline of a press release, which was later revealed as pro forma earnings in the contents (such as net income excluding exceptional items). Landsman et al. (2007) examined the components of earnings that analysts exclude from the net income of GAAP to reach pro forma earnings based on Ohlson (1999)'s methodology by using three quality attributes to examine the relevance of pro forma earnings: abnormal earnings forecasting, predictability of exclusions, and the valuation of exclusions. Their findings showed that the market mispriced positive and negative total exclusions, special items, and other types of exclusions, which suggests that the market is misled by managers' opportunistic pro forma reporting strategy. Black & Christensen (2009) studied the components of accounting adjustments managers to consider pro forma

earnings reporting, and discovered that managers exclude recurring accounting items to make pro forma earnings reporting meet strategic earnings targets. Some studies moved towards examining specific adjustments to investigate managers' opportunistic reporting behaviour. Barth et al. (2012) examined the differences in recognising stock-based compensation expense when managers calculate pro forma earnings and when analysts obtain street earnings to understand whether the incentives of managers to report pro forma earnings differ from analysts' street earnings. They found that managers opportunistically excluded stock-based compensation expenses from pro forma earnings to increase earnings, smooth earnings, and meet earnings benchmarks. This opportunistic incentive also exists in analysts' street earnings reporting, but it does not explain the incremental opportunistic incentive by analysts because they are keen on managing investor perceptions of firms' performance only when management is doing the same, which suggests they seek to curry favour with managers.

Outside the U.S., opportunistic non-statutory earnings reporting also exists in European countries. For example, Walker & Louvari (2003) examined the determinants of voluntary disclosure of non-statutory earnings in the U.K. context and discovered that the voluntary disclosure of a non-statutory earnings measure is positively related to the extent to which non-statutory earnings measure exceeds statutory earnings. Moreover, they found that loss firms are less likely to report non-statutory earnings that convert a loss into a lower loss, which suggests that firms generally appear to be motivated to present a more favourable earnings metric and management do not want to create the impression that a current loss is likely to be sustained. Hitz (2010) investigated the determinants of firms' decisions to report non-statutory earnings in a largely unregulated setting in the German capital market and discovered that firms emphasise non-statutory earnings more than statutory earnings. Firms

that do not meet earnings benchmarks under statutory earnings are much more likely to report non-statutory earnings than firms that meet or beat these benchmarks under statutory earnings. Isidro & Marques (2014) used hand-collected data for a sample of large European firms to study the impact of economic factors and countries' institutional on managers' non-GAAP reporting. They found that in countries with efficient legislative systems there is strong protection for investors, and the developed capital market and sound communicational channels tend to utilise non-GAAP reporting to reach significant earnings benchmarks because managers are under pressure to meet or beat earnings targets in institutionally strong and economically developed jurisdictions.

In sum, above discussed suggest that managers opportunistically report non-statutory earnings, and when the GAAP earnings cannot meet the earnings thresholds, they tend to report non-statutory earnings to meet or beat GAAP earnings targets by excluding the recurring earnings components from statutory earnings.

2.2.2.3 Evidence of co-existing reporting

To generalise non-statutory earnings reporting as opportunistic behaviour is not comprehensive because recent literature shows that non-statutory earnings reporting can consist of opportunistic and efficient behaviour.

Lougee & Marquardt (2004) was the first study to show that the results of non-statutory earnings reporting was mixed, which indicated that the results supporting efficient reporting revealed that firms with less informative GAAP earnings is the reason why firms report pro forma earnings. In this case then, pro forma earnings are positively related to firms' future profitability. The results supporting opportunistic reporting found that firms that cannot meet

the benchmarks of earnings under GAAP earnings tend to report pro forma earnings in press releases. Lougee & Marquardt (2004) concluded that this evidence cast doubt on whether pro forma earnings can be utilised to inform or mislead investors depends on the context. Curtis et al. (2014) examined quarterly non-GAAP earnings information that contained transitory gains to determine whether managers have an incentive to report non-GAAP earnings to either misguide or inform investors. They used a between-sample design in their study to classify the sample into two types: the informative group (non-GAAP EPS less than GAAP EPS by excluding the gains or the EPS effect of the gain in the earnings announcement), and the opportunistic group (non-GAAP EPS greater than the GAAP EPS by including the gains or the EPS effect of the gain in the earnings announcement). The results supported both motivations: evidence consistent with the efficient reporting of non-GAAP earnings information suggests that transitory gains help investors to price these gains efficiently, while evidence from the opportunistic group finds that among opportunistic reporters, managers' reporting choices affect investors' perceptions of operating earnings at the earnings announcement. Overall, these results suggest that the most persuasive motivation behind non-GAAP earnings reporting is to inform (47.5% of which 37.6% was to consistently inform, and 9.9% to inform to some extent), although a significant number of firms tend to be opportunistic to influence investors' perceptions about earnings (27.2 %). The remaining 25.2 % of the sample consistently failed to disclose information on non-GAAP earnings.

Unlike Curtis et al. (2014)'s study that used the between samples technique, Choi & Young (2015)'s study pooled the full sample to test the motivation of management non-statutory earnings reporting in the U.K. To achieve this they examined non-statutory earnings by excluding the absolute value of transitory gains and losses and found that, consistent with efficient reporting, the probability of non-GAAP earnings is positively related to transitory

items when GAAP earnings meet or beat analyst's consensus earnings forecast, and consistent with opportunistic reporting, the positive relationship between transitory items and non-GAAP earnings is much weaker when GAAP earnings do not meet the expectations. Choi & Young (2015) concluded that whether managers reporting non-GAAP earnings are efficient or opportunistic depends on the GAAP earnings surprise.

This evidence suggests that efficient reporting and opportunistic reporting of non-statutory earnings co-exists with specific but different drivers in different firms.

2.2.3 Market reactions to non-statutory earnings reporting

Given the mixed incentives for managers reporting on non-statutory earnings, the ability of investors to fully understand management's reporting strategy is an open question because the evidence shows that investors can 'see through' opportunistic reporting (e.g., Black et al., 2014; Curtis et al., 2014; Lougee & Marquardt, 2004), and there is also evidence to show that investors can be misled by managers' opportunistic reporting (e.g., Doyle et al., 2003; Landsman et al., 2007).

Studies found that different market participants can respond to non-statutory earnings reporting differently because of differences in financial knowledge. The early evidence provided by Bhattacharya et al. (2003) shows that analysts and ordinary investors react differently to pro forma reporting. Investors may consider that pro forma reporting is less informative when pro forma earnings can meet analyst's expectations while the GAAP operating earnings fall below analysts' expectations, whereas analysts can be more sceptical of pro forma earnings when firms report them in order to convert the GAAP operating loss into pro forma earnings. Frederickson & Miller (2004) carried out an experimental study to

examine how reporting on pro forma earnings affects the judgment of more sophisticated (i.e., analysts) and less sophisticated (i.e., non-professional investors) investors. They found that non-professional investors who received an earnings announcement that reported both pro forma and GAAP earnings, evaluated a higher stock price than non-professionals who obtained an announcement with GAAP reporting only. However, the stock price judgments of more sophisticated investors were not influenced by pro forma reporting. Elliott (2006) examined how non-professional investors and analysts' reacted to two pro forma reporting features (i.e., the existence of a quantitative reconciliation between GAAP earnings and pro forma earnings; the pro forma emphasis) and found that for non-professional investors, the emergence of pro form earnings emphasised by managers influenced their judgment and decision making. Such an impact can be alleviated by showing a quantitative reconciliation. Analysts were not influenced by the presence of and emphasis on pro forma earnings, but their judgement and decision making were influenced by the emergence of reconciliation in the opposite direction to non-professional investors. Specifically, the emergence of quantitative reconciliation made analysts consider pro forma earnings as being more reliable, enhancing their reliance on pro forma reporting to assess the earnings performance of a firm. Andersson & Hellman (2007) carried out experimental research in Sweden to investigate how analysts' earnings forecasts are influenced by pro forma earnings reporting, and found that analysts with both pro forma and GAAP information made much higher GAAP EPS forecasts than the those with only GAAP information; this suggests that non-statutory earnings reporting also can influence the judgement of sophisticated users in evaluating firm performance in Sweden.

However, an experimental study might lack external validity with regards to the population because experimental settings are necessarily simple (Allee et al., 2007). Allee et al. (2007) complemented and validated these experimental researches using archival data to support

external validity. They also used the abnormal net purchasing activities of small investors over a three day announcement window as proxy for less sophisticated investors, and used the net purchasing activities of large investors over a three day announcement window as proxy for sophisticated investors. The results conformed to Frederickson & Miller (2004)'s experimental evidence showing that less sophisticated investors depend more on quarterly earnings press releases that contain pro forma earnings to make decisions, while more sophisticated investors exhibit the opposite behaviour. Moreover, like Elliott (2006)'s results, Allee et al. (2007) found that less sophisticated investors rely more on pro forma earnings when managers opportunistically emphasise pro forma earnings, while the trading activity of more sophisticated investors cannot be affected by emphasising the two earnings metrics.

This evidence shows that an opportunistic emphasis on non-statutory earnings in a press release affects the judgments of less sophisticated investors, whereas the influence of opportunistic reporting on less sophisticated investors decreases when the reconciliation between non-statutory earnings and statutory earnings is included. The motivations for non-statutory earnings reporting and the market reactions on non-statutory earnings reporting are summarised in Appendix 1.1.

2.2.4 Regulatory response on non-statutory earnings

2.2.4.1 Regulation in the United States

Regulators concern about the misleading information contained in pro forma earnings in the U.S., so to improve the reliability and accuracy of firm reporting, and to regain the confidence of the general public in the stock market, the SEC was instructed in section SOX (namely U.S. Congress stipulated the Sarbanes-Oxley Act) 401 (b) to introduce regulations to

manage pro forma company reporting. The SEC introduced Regulation G (Reg G), item 10(e) of Regulation S-K and item 12 to govern pro forma earnings reported outside the financial statements in 2003. Reg G includes all the public reporting of pro forma financial evaluation containing conference calls, press releases, presentations to investors, and other forms of media. In order to establish transparency in calculating pro forma earnings, the regulation demands that the reporters reconcile pro forma earnings with statutory earnings. While the SEC attempts to ensure pro forma earnings reporting is useful and has not been completed in a misguided manner, it does not prohibit pro forma reporting (SEC, 2003).

Various empirical studies have examined the influences of regulations on pro forma earnings reporting, with some findings showing that Reg G in the U.S. resulted in a decline in the pro forma earnings reported. For example, Marques (2006) documented that the average percentage of firms that reported pro forma earnings decreased from 63% (before the introduction of Reg G) to 50% (after adoption of Reg G). According to Heflin & Hsu (2008), not only did the frequency of pro forma earnings reporting decrease, so too did the number of exclusions showing discrepancies between GAAP and pro forma earnings. However, this declining trend reversed with an upwards trend in 2012 in U.S. (Black et al., 2012). Studies found that the quality of pro forma earnings being reported increased after Reg G in terms of less opportunistic pro forma measures (Bowen et al., 2005); potentially misleading reporting practices decreased (Entwistle et al., 2006); confident in the market increased (Marques, 2006); the probability that firms disclose pro forma earnings to meet or beat forecasts declined (Heflin & Hsu, 2008); and restraining mispricing was affective (Zhang & Zheng, 2011).

2.2.4.2 Regulation in the Australia

In 2009, the AICD and FINSIA released guidelines that encouraged Australian listed firms to disclose underlying earnings. These guidelines aimed to give financial reporting users (e.g., investors) a better understanding of underlying earnings in firms. FINSIA and AICD asserted that underlying earnings shows how managers evaluate a firm's performance for ongoing operations. The market may improve if a firm disclosed the number of underlying earnings and provided an explanation (AICD & FINSIA, 2009, p.12).

However, Australian Securities & Investments Commission (ASIC) concerns about reporting underlying earnings may mislead users. ASIC issued Consultation Paper 150 in March 2011, proposing guidelines to minimise any adverse impact that may result from firms' reporting underlying earnings. It includes that managers should explain how these underlying earnings are calculated and why it is important to include this information; underlying earnings should not be shown with greater prominence than statutory information; and managers should reconcile between underlying earnings and statutory earnings. Besides, underlying earnings should be consistently shown on a regular basis (ASIC 2011, March).

'Regulatory Guide 230: Disclosing non-IFRS financial information' was published in December, 2011 to promote clear and full underlying earnings reported for financial information users and reduce the probability of users being misguided by that information. These guidelines do not replace the legislation but following them may reduce the probability of firms trying to mislead investors and analysts. Regulatory Guide 230 documents that underlying earnings are permitted in communications such as directors' reports, press releases; notes to financial statements, and analyst briefings, but such reporting must not be misleading or have greater prominence than the statutory financial information. Underlying

earnings can only be disclosed when it is important to offer a true and fair view of financial statements. Moreover, firms must reconcile underlying earnings and statutory earnings by showing and explaining the adjustments (ASIC 2011, December).

2.2.4.3 Regulation in the international

Permissive international rules govern non-statutory earnings (Young, 2014). According to the International Accounting Standard 33 (IAS 33), reporting non-statutory earnings may be permitted with the accompanying notes and income statement. Similar to Reg G in U.S. and Regulatory Guide 230 in Australia, it does not restrict communicating non-statutory earnings to investors but it requires that non-statutory earnings must not be presented more prominently than statutory earnings, and non-statutory earnings should be reconciled to a corresponding line item in the income statement.

In sum, although regulators are concerned that non-statutory earnings reporting could mislead investors' judgment on a firm's value but they do not prohibit firms reporting their non-statutory earnings.

2.3 Theoretical framework and development of hypotheses

While acknowledging that most recent researchers found that managers' motivations for reporting non-statutory earnings received mixed responses from investors, this paper develops research hypotheses based on signalling theory, prospect theory, and agency theory, to examine the behaviour of managers' underlying earnings reporting where signalling theory explains efficient reporting; prospect theory and agency theory explain opportunistic reporting.

2.3.1 Signalling theory

2.3.1.1 Definition of signalling theory

Signalling theory was first introduced by Spence (1973) to reduce information asymmetry between job candidates and employers. Spence used the labour market to model the signalling educational function. In explaining signalling theory, Spence argued that potential employers lack information on the capabilities of job candidates, and candidates used education to signal their capabilities to potential employers. Spence then formulated two types of candidates, one with high productivity and another with low productivity. Highly educated candidates signalled their more formal education as a trustworthy signal for high productivity so that employers would pay a higher wage. Therefore, signalling theory asserts that the attributes of one party can be used to communicate with another party to reduce information asymmetry.

2.3.1.2 Key concepts of signalling theory

Figure 1: Key concepts of signalling theory

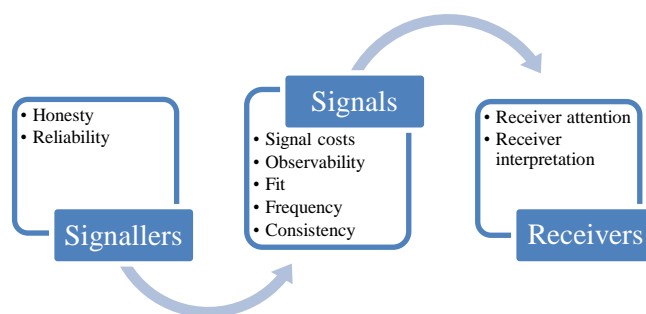


Figure is cited from Connelly & Certo et al. (2011)

Figure one presents the key concepts of signalling theory where signallers are insiders who gain information about an individual (Spence, 1973), an organization (Ross, 1977), or a product (Kirmani & Rao, 2000), which is useful but unavailable to outsiders. Private information offers insiders a privileged viewpoint of the underlying quality of individuals, goods, or firms, but to distinguish it from others, signallers signal their private information to receivers. How effective this signal is to a receiver is the extent to which signaller's signal honestly and reliably (Durcikova & Gray, 2009; Zhang & Wiersema, 2009; Connelly & Certo et al., 2011). The former refers to the extent to which a signaller actually has the unobservable attribute being signalled (Arthurs et al., 2008), while the latter refers to the degree to which the signal is associated with unobservable attributes (signal fit) and the degree to which signallers attempt to deceive (signaller honesty) (Connelly & Certo et al., 2011). Signalling theory emphasises the actions signallers take to reduce information asymmetry, but they are not all useful as signals because effective signals contain the following qualities as a given attribute:

First, signals should be observable, which means the extent to which outsiders can notice them because if the actions of insiders are not observed by outsiders, it is hard to utilise those actions to communicate with outsiders (Warner et al., 2006).

The second is that the cost of marginal signals should be less than the benefits. This notion of cost means that some signallers are much better than others at absorbing the related costs (Spence, 1973), so to retain their effectiveness, the costs should be structured such that dishonest signals do not pay. The most effective signals are information that is hard to imitate (Toms, 2002) because individuals or corporations might try to deceive by sending dishonest signals if they are easily imitated with little cost (Connelly, Ketchen & Slater, 2011).

The third, signalling efficacy could be improved by sending out more observable signals or enhancing the amount of signals which can be called the frequency of signal (Janney & Folta, 2003). Moreover, signalling consistency is an agreement between signals from one source; this can also increase the signalling process, particularly if various signals are utilised to communicate information about the same message (Balboa & Marti, 2007).

In signalling theory, information asymmetry can operate in both directions. Receivers³ want information about signallers and signallers want information about receivers, so signallers might understand what kind of signals are most relevant and how receivers interpret signals (Connelly, Ketchen & Slater, 2011). Receivers are important in signalling theory because the extent to which they scan the environment for signals (receiver attention) and how other receivers translate signals in a different way compared to others (receiver interpretation) influence the signalling process (Perkins & Hendry, 2005; Srivastava, 2001; Connelly, Ketchen & Slater, 2011).

2.3.1.3 Applications of signalling theory in the literature

Signalling theory has been used for several decades in research. In marketing literature, Kirmani & Rao (2000) provide a basic signalling model which assumes that a firm may signal the unobservable quality of its products through several mixed marketing variables. In that model the authors utilised low quality and high quality firms, and stated that if signals are an appropriate mechanism to convey unobservable qualities, then firms will probably use the least expensive signal. Signalling costs should be just high enough to dissuade a low quality firm from signalling, but low enough to make signalling attractive for a high quality firm. Scholars have investigated how management decision can be used to signal firm's

³ Receivers in signalling theory are outsiders who lack information about the organisations but would like to perceive this information as useful if they receive it (Connelly & Certo et al. 2011).

quality to others. Connelly, Ketchen & Slater (2011) for example, found that a large investment in a production plant can signal a firm's quality because it is highly visible and costly to imitate.

Literature relating to accounting and finance has also provided several examples to demonstrate signalling theory. Ross (1977) for instance, posited that debt levels signal a firm's credit risk to lenders, and argued that only high quality firms can make long term interest payments, while low quality firms find these payments difficult to sustain. As a consequence, debt levels would influence a lenders' perception of firm quality. Bhattacharya (1979) showed that dividends signalled firm profitability to investors, and then stated that only high quality firms can make sustainable dividend payments, and therefore firm dividends would influence investors' perceptions of firm quality. In the line with Bhattacharya's (1979) study, Koerniadi & Tourani-Rad (2011) found that dividends are a signal and market reactions to increased dividend announcements are mainly positive, which suggests that these announcements are a signalling event to communicate future profitability.

Other researchers found that managers may signal firm quality through their ownership to outsiders because management ownership is costly (e.g., Dainelli et al., 2013; Sanders & Boivie, 2004; Filatotchev & Bishop, 2002). Signalling theory in accounting and finance literature then moves towards management voluntarily reporting strategy. Empirical studies find that a high quality firm will not hide their quality in the market and they are willing to provide additional financial information to help investment decision making because managers expect a high level of future growth (Kanagaretnam et al., 2007; Mitchell, 2006; Cotter et al., 2011). Penman (1980) found that firms with good news often forecast voluntary earnings. Lim et al. (2007) investigated the management voluntarily reporting choice in Australia context and discovered a positive relationship between firm profitability and voluntary reporting. According to Siregar & Utama (2008), managers tend to report

additional supplemental earnings guidance in their financial statements to investors for equity valuation decision making.

There are many studies in recent literature pertaining to signalling theory which shows that when information available to the public does not inform the market, managers are more likely to disclose high quality relevant information. Tasker (1998) for instance, found that firms with less informative financial information tend to make quarterly conference calls, while Chen et al. (2002) found evidence that firms with less informative earnings tend to report on voluntary balance more than firms with higher informative earnings, and Lougee & Marquardt (2004) found that managers are more likely to report pro forma earnings when they believe that GAAP earnings are less informative than pro forma earnings.

2.3.2 Development of efficient reporting hypothesis

According to current literature, managerial motivations to signal additional financial information are as follows: (1) management talent signalling (Shehata, 2014); studies have found that talented managers voluntarily forecast earnings in order to display their talent, because investors observe their ability to forecast transformations in the corporate financial environment and provide feedback in the future; this is one of the determining elements for a corporations' market value (e.g., Graham et al., 2005; Healy & Palepu, 2001; Trueman, 1986); (2) limitation of mandatory reporting (Shehata, 2014). In most cases legislation and regulations only offers investors the minimum amount of information during the decision making process (Al-Razeen & Karbhari, 2004), so the need for voluntary reporting of information fills the gaps made by mandatory reporting (Graham et al., 2005; Shehata, 2014); (3) information asymmetry (Arvidsson, 2011). Since information asymmetry between those inside and those outside a firm, voluntary reporting can fill the gap from the perspective of

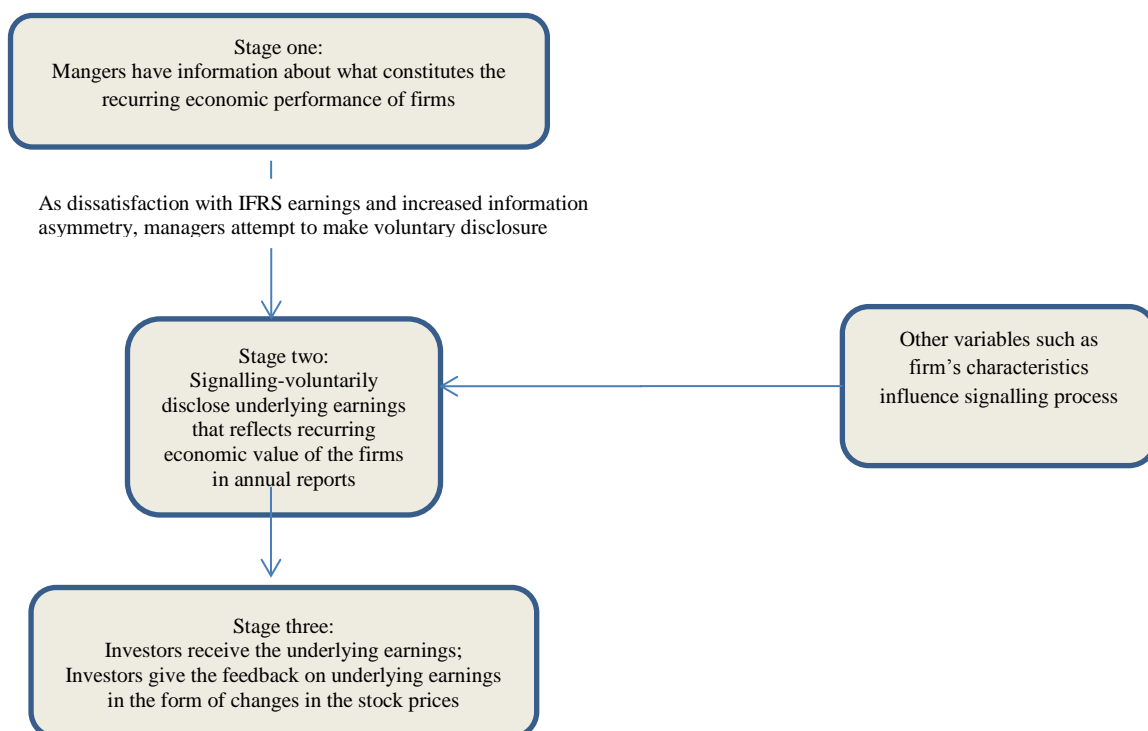
principal and agent (Jensen & Meckling, 1976). Therefore, to decrease information asymmetry and also reduce their agency problems, a firm can voluntarily choose to disclose information that exceeds the mandatory regulations of reporting (Wyatt, 2002; Tasker, 1998).

Managers assert that IFRS-based earnings fail to reflect ongoing business activities and do not accurately measure recurring economic performance, in which increases information asymmetry between firms and investors. In response, firms attempt to report underlying earnings to help investors better evaluate their underlying values. It is argued that the increasing dissatisfaction with IFRS-based statutory earnings in Australian listed firms means that information asymmetry between management and investors has increased. This result provides appropriate incentives for firms to signal underlying earnings as an alternative to announce recurring economic performance to investors. Indeed, voluntarily reporting to outsiders could reduce information asymmetry but also increase the efficient allocation of resources on the stock market, while forcing external stakeholders to improve their evaluation of a firm's future performance, and thus lower the average cost of debt capital (Sengupta, 1998) and equity capital (Kristandl & Bontis, 2007; Botosan & Plumlee, 2002), decrease bid-ask spreads (Petersen & Plenborg, 2003), and increase stock liquidity (Diamond & Verrecchia, 1991; Healy et al., 1999). Consequently, voluntarily reporting underlying earnings (an observable attribute) are perceived as a signal in annual reports to help investors uncover the underlying performance (an unobservable attribute).

The relationships described above are summarised in figure 2. In stage one, since IFRS-based earnings are perceived as performance measures that fail to reflect the recurring economic performance of managers, managers obtain information on what constitutes firms' recurring economic performance, which investors will find useful. Stage two assumes that firms'

recurring economic performance is signalled to investors through annual reports in the form of underlying earnings. This paper uses annual reports as a communication tool because they can be made on regular basis, and they give a compact and comprehensive historical account of firm concerns and managerial thoughts (Niemark 1995, pp. 100-101). Empirical evidence suggests that annual reports offer a special opportunity for firms to communicate beyond financial reports (Cameron & Guthrie 1993; Abeysekera, 2008) to show leadership and vision and also reflect firm values and position (Clackworthy 2000; Abeysekera, 2008). Noise can be introduced by the signalling environment when processing signals, by external referents (e.g., regulators, previous employees outside the firm, or members of a relevant comparison group), or other signallers (Branzei et al. 2004; Zahra & Filatotchev, 2004). Stage three assumes that investors receive information about underlying earnings and give feedback on such an alternative performance measure in the form of changes in the stock prices.

Figure 2: Flow chart of theoretical framework for efficient underlying earnings reporting based on signalling theory



Based on these discussions, underlying earnings is viewed as a signal that indicates the recurring economic performance of firms when statutory earnings fail to do so. Thus, the following hypothesis is made:

H1: When statutory earnings fail to reflect their recurring economic performance, firms are more likely to disclose underlying earnings.

2.3.3 Prospect theory

2.3.3.1 Definition of prospect theory

Prospect theory was first put forward by Kahneman & Tversky (1979) and extended by Tversky & Kahneman (1992). According to Kahneman & Tversky (1979), decision makers derive value from losses and gains by referring to a ‘reference point’, while individuals who are loss averse will frame decisions on perceived gains rather than perceived losses. Loss aversion that results in the value function around the reference point, is convex in losses and concave in gains (the S-shaped value function), and steeper for losses than for gains in general (diminishing sensitivity).

Kahneman & Tversky (1979) further stated that people tend to overweigh outcomes considered as certain and underweight outcomes that are merely probable. People tend to be risk averse for gains (Certainty effects) and be risk seeking for losses (Reflection effect). As an example, consider the following problems:

Problem 1 (Kahneman & Tversky, 1979, p.265)

Plan A: 0.8 chance to win \$4000

Plan B: win \$3,000 with certainty

The result showed that most people (80% of 95 respondents) chose Plan B.

Problem 2 (Kahneman & Tversky, 1979, p.268)

Plan A: 0.8 chance to loss \$4000

Plan B: loss \$3000 with certainty

The result showed that most people (92% of 95 respondents) chose Plan A.

Kahneman & Tversky (1979) concluded that risk aversion in the positive domain is accompanied by risk seeking in the negative domain, which results in the value function being S-shaped where it is normally concave for gains and mostly convex for losses, and is generally steeper for losses than for gains (diminishing sensitivity).

2.3.3.2 Key concepts of prospect theory

This combination of loss aversion, diminishing sensitivity, probability weighting and reference dependence are the main components of prospect theory (Hastie & Dawes, 2001; Barberis, 2013; Yao & Li, 2013).

(1) Reference dependence

Prospect theory argues that an individual frames a decision problem, not according to final wealth levels, but according to their perception of losses and gains relative to a reference point (Yao & Li, 2013; Li & Yang, 2013). Therefore, for a certain growth in wealth, the corresponding growth in value is greatest when it transforms from a loss to gain relative to a reference point. Different decision makers tend to have different reference points. In accounting and finance literature for example, zero change in earnings and zero level of

earnings are the natural reference points for decision makers who estimate wealth as a multiple of earnings (Burgstahler & Dichev, 1997; Zhang et al., 2008).

(2) Loss aversion

The important insight into prospect theory is that individuals tend to be loss averse. An individual loses overweight with respect to comparable gains (Yao & Li, 2013; Li & Yang, 2013; Zhang et al., 2008; Burgstahler & Dichev, 1997). Loss aversion leads people to value what they have more than things they do not have. The pleasure of getting something new is less than the pain of losing existing possessions of comparable value, and the process of getting an object greatly increases its value; for example, people are likely to become more upset when they purchase a stock which decreases in value than when they fail to purchase a stock whose value increases (Levy, 1996).

(3) Diminishing sensitivity

The value function is convex in the region of losses and concave in the region of gains. The marginal value of both losses and gains is a decreasing function of their magnitude (Tversky & Kahneman, 1992). For example, while replacing a \$100 gain (or loss) by a \$200 gain (or loss) is an important utility influence, while replacing a \$1000 gain (or loss) with a \$1100 gain (or loss) has less influence (Barberis, 2013). Concavity over gains finds that people are more likely to be risk averse over moderate gains than probability gains, while convexity over losses finds that people are likely to be risk seeking over moderate probability losses. Diminishing sensitivity means that the influence of a given change in probability decreases with its distance from the boundary. For instance, the growth of 0.1 in the probability of winning a given prize is more influential than when the probability of winning changes from 0.9 to 1.0 or from 0 to 0.1, than when the probability of winning changes from 0.3 to 0.4 or

from 0.6 to 0.7. Thus, diminishing sensitivity results in a weighting function that is convex near 1 and concave near 0 (Tversky & Kahneman, 1992, p.303).

(4) Probability weighting

In prospect theory, people weigh results by transformed probabilities or decision weights instead of their objective probabilities (Tversky & Kahneman, 1992). Decision weights are computed with help from a weighting function whose argument is an objective probability. Kahneman & Tversky (1979) and Tversky & Kahneman (1992) concluded that unlike the S-shaped value function, the weighting function is an inverted S-shape, because when individual is presented with very low probabilities, the very low probabilities are generally over-weighted by people, while the high probabilities are generally under-weighted.

2.3.3.3 Applications of prospect theory in literature

Insurance is a promising place to apply prospect theory (Barberis, 2013). For example, Sydnor (2010) studied the insurance decisions of 50,000 clients and found that the annual claim rate is around 5% and customers tended to pay \$100 annually to insure against a 5% chance of paying an extra \$500 in the event of a claim, thus confirming the probability weighting assumption that low probability is overweighted by individuals. Barseghyan et al. (2012) developed a structural model of risky choice that allows for standard risk aversion and nonstandard probability distortions using data on households' deductible choices in auto and home insurance. They found that large probability distortions (that is only mild insensitivity to probability changes but substantial overweighting of small probabilities) played an economically and statistically significant role in explaining households' deductible choices, thus suggesting that probability weighting is important to customer' decisions on choosing an insurance policy. According to Hu & Scott (2007), prospect theory provides a way of

comprehending the reason why annuities are unpopular; within their framework, people consider an annuity as a risky gamble with an unknown payoff at retirement, so it is the current value of the payouts to be gained from annuity before death, minus the amount initially paid for the annuity. This confirms the assumption of loss aversion suggested by prospect theory because they found that an annuity is not appealing because people tend to be more sensitive to the potential loss on the annuity (if a person dies soon) rather than the potential gain (if a person lives for a long time).

Finance is another field where prospect theory has been actively adopted. Finance studies have applied prospect theory to examine situations where a number of fiscal assets generate higher returns on average than others. For example, Barberis & Huang (2008) examined asset pricing in a one-period economy populated by investors and found that investors overestimate the impossible state of the world where they make lots of money by investing in overpriced stock. Thus, they want to pay a high price for stock, even when it is earning a low return on average. Kyle et al. (2006) applied prospective theory to the liquidation decisions of an agent who owns a project (e.g., a housing position or an indivisible financial asset) and found that agents are willing to delay liquidation of relatively inferior projects if they are making losses, but they tend to accelerate liquidation of relatively superior projects due to loss aversion.

In extant literature, only one article applied prospect theory to explain pro forma earnings reporting. Andersson & Hellman (2007) carried out an experimental study from a users' perspective to investigate how pro forma reporting influences analysts' decisions. The study has two groups: one that includes accounting data based on pro forma and GAAP calculations where pro forma earnings are greater than GAAP earnings, and a second group that only involves GAAP-based accounting data. They found that analysts had much higher

earnings per share forecasts when they were presented with two different earnings (GAAP earnings and pro forma earnings) than when they only received GAAP earnings. The authors therefore concluded that analysts' judgments are loss averse because they frame decisions on perceived gains rather than perceived losses, as proposed by prospect theory.

2.3.4 Agency theory

2.3.4.1 Definition of agency theory

Agency theory is concerned with the principal-agent problem in the separation of ownership and control of a firm, so assumed that individuals are bounded by rationality and self-interest (Jensen & Meckling, 1976). The separation between suppliers of capital to a firm (e.g., investors and creditors are the principal) and managers (they are agent) controlling a firm leads to information asymmetry where managers (the agent) have more information than capital providers (the principal) and initiate conflict between capital providers and managers (Fama & Jensen, 1983). Capital providers have an incentive to align the self-interest of managers with theirs own by incurring additional agency costs. Jensen & Meckling (1976) defined agency costs as the sum of the monitoring and bonding costs undertaken to reduce costs due to conflicts of interest plus the 'residual loss'. Bonding costs are costs incurred to align self-interests, and monitoring costs are to ensure that self-interests are aligned. A 'residual loss' occurs because it is generally impossible to perfectly align the agent's interests with that of the principal (Jensen & Meckling, 1976). A 'residual loss' remains even though all parties have been completely informed (Morris, 1987).

2.3.4.2 Key concepts of agency theory

The theory focuses on determining the most efficient contracts governing the principal-agent relationship. The key factors of agency theory are assumptions regarding the information

(information asymmetry and information is a commodity which can be bought), the people (people are bounded by rationality, self-interest and risk aversion), and the organisations (goal conflict amongst members) (Eisenhardt, 1989).

Information

The separation of ownership and control of a firm leads to the information asymmetry between the managers and suppliers of capital. According to agency theory, information has a price and therefore can be purchased as a commodity. Firms can invest in information systems to control agent opportunism, but this gives an important role to formal information systems such as the board of directors and budgeting, and informal information systems such as managerial supervision. The board of directors is an information system for monitoring managers' behaviour, so they can be used as monitoring devices for shareholder interests (Fama & Jensen, 1983). When a board of directors provides richer information, managers are more likely to be consistent with stockholders' interests, while their opportunistic behaviour that tends to benefit them more than stockholders are less likely when boards are better monitors of stockholders' interests (Eisenhardt, 1989).

Bounded rationality, self-interest and risk aversion

Agency theory assumes that both parties (the agent and the principal) are rational and will act on their own self-interest, and this will not necessarily coincide. Capital providers will be interested in maximising their wealth (e.g., maximise the share price) while manager will want to maximise their rewards for managing the firm (e.g., management compensation) (Gaffikin, 2008, p.59). The other important assumption of agency theory is that the principal and the agent may prefer different actions because of different risk preferences. Generally, agents are risk averse because they cannot diversify their employment, while principals are risk neutral because they can diversify their investments (Eisenhardt, 1989).

Conflicting Goals

The heart of agency theory is the conflicting goals that are inherent when agents and principals with differing preferences cooperate, and where the essential metaphor is the contract (Eisenhardt, 1989). The conflicting goals and different attitudes towards risk between principals and agents leads to two aspects of the agency problem: moral hazard and adverse selection. Moral hazard refers to a lack of effort by managers (the agent), with the argument being that managers are shirking and may not be putting forth the effort they agreed upon (Eisenhardt, 1989). For example, managers may take over-delegation of duties and responsibilities (Gaffikin, 2008, p.59). Adverse selection refers to managers misrepresenting their ability by claiming to have certain skills or abilities. This happens because the capital providers (the principal) cannot completely verify these skills or abilities either at the time of hiring or while the agent is working (Eisenhardt, 1989). For instance, managers may be less willing to engage in high-risk, high-return investments because they may lose their job if the investments 'fail' (Gaffikin, 2008, p.60).

2.3.4.3 Applications of prospect theory and agency theory in literature

There are two particularly influential articles produced in the late twentieth century; Jensen & Meckling (1976) explored the ownership structure of a firm who argued that managerial ownership can limit managers' opportunistic behavior because managers will incur greater costs for misconduct. Fama & Jensen (1983) described the role of the board of directors as control function of an information system that the owners could use to monitor manager's opportunism. Later literature on agency theory examined the trade-off between the behavior and outcomes in transferring risk to the agent (Eisenhardt, 1989), and showed how contracts based on behaviour or outcomes are better at controlling agency problems (Argawal & Mandelker, 1987; Walkling & Long, 1984; Eisenhardt, 1989).

Prospect theory amends agency theory by offering insights into the fear of loss related to current wealth, which has an enormous impact on the risk preferences of decision makers (Li & Yang, 2013). The shift of risk preferences against a reference point for framing decisions as a loss or gain amends the main emphasis on risk aversion articulated by agency theory (Zhang et al., 2008).

In accounting literature, prospect theory has been aligned with agency theory to argue that individuals are self-wealth maximising and loss averse, and therefore managers have incentives to utilise earnings management techniques⁴ to avoid missing the earnings benchmarks (zero earnings, previous earnings, or analysts' forecast earnings) to influence how investors frame their decisions on firm performance. For example, Burgstahler & Dichev (1997) found evidence that managers attempt to manage earnings upwards when unmanaged earnings fall short of earnings thresholds. In their study, there are 30% to 44% of firms with slightly negative pre-managed earnings that exercise discretion when reporting positive earnings. By focusing on earnings management to prevent losses, the study found that operating cash flows and changes in working capital were utilised to manage earnings. The study concluded that managers tend to apply earnings-increasing management around the wealth reference points (in the vicinity of zero changes of earnings and zero levels of earnings) to affect firm value as perceived by investors and other stakeholders. Burgstahler & Eames (2006) found that managers manage earnings upwards to increase reported earnings in order to achieve small positive earnings surprises. Bartov et al. (2002) studied the 'expectation game' where firms and investors emphasize the extent to which reported earnings are the same as or different to analysts' forecasts. Their findings showed that a quarter's abnormal returns are significantly and positively related to the earnings surprise,

⁴ The definition and motivation of earnings management are discussed in section 3.2.1 and section 3.2.2 in chapter 3.

suggesting that firms become better at meeting or beating analysts' forecasts and this success is achieved in part by earnings management. Dhaliwal et al. (2004) examined whether management manipulates accounting numbers (tax expense) as an earnings management tool to meet or beat analysts' forecasts. They found that firms lower their projected tax rates to decrease their tax expense if their non-tax income will not reach the earnings threshold. The study concluded that when non-tax earnings are less likely to achieve analysts' forecasts, managers would manipulate tax expenses to get a last chance to meet or beat analysts' forecasts. Shen & Chih (2005) examined the incentive of banks to manage earnings across 48 countries from 1993 to 1999. The sample was divided into a high earnings group (banks with earnings or changes in earnings higher than zero), and a low earnings group (banks with earnings or changes in earnings lower than zero). The authors regressed risk on returns for each group and found the coefficient of risk and returns for the high earnings group was positive and negative for the low earnings group. This result suggests that a manager is motivated to report earnings that exceeded the threshold or reference point, where for instance zero earnings levels or there are zero changes in earnings to gain a reward. Holland & Ramsay (2003) examined the distribution of earnings at two benchmarks (zero earnings and either a sustaining or increase last year's earnings) in the Australian context, and found that firms with small profits and small earnings frequently increased while those firms with small losses and small earnings frequently decreased. These results draw inferences regarding the manipulation of earnings around zero earnings and zero changes in earnings. Sun & Rath (2012) investigated the motivations of managers to manipulate the reported earnings utilising a sample of Australian firms from 2000 to 2006, and found that managers manipulate earnings by attempting to reach two earnings benchmarks: a positive change in earnings and avoiding losses. The study found that when pre-managed earnings were below earnings in

previous years or zero, firms tended to engage in positive discretionary accruals to increase earnings so that to beat both of these earnings benchmarks.

2.3.5 Development of opportunistic reporting hypothesis

According to prospect theory and agency theory, the opportunistic underlying earnings reporting hypothesis in this paper assumes that when firms make IFRS earnings losses or miss IFRS earnings target⁵, stock prices will drop dramatically because investors are loss averse and the impact of these losses on investor's value is greater than the gains (S-shaped value function). Managers have an incentive to manipulate earnings using earnings management techniques to avoid the stock price decreasing when firms make IFRS earnings losses or miss IFRS earnings targets because their compensation is tied to budgets and targets; this means they are paid for what they do relative to some targets (Jensen, 2005). Since applying within-IFRS earnings management (e.g., accruals earnings management) is costly for listed public firms, because they are regulated rigorously, managers must find other earnings management techniques that are hard to be detected to manage investors' perceptions. Since no entries are involved (no debits or credits) when calculating and reporting underlying earnings that will not be audited, opportunistic underlying earnings reporting is perceived to be a less detectable earnings management technique and good communication channels for managers (Doyle et al., 2003; Doyle et al., 2013; Andersson & Hellman, 2007). By providing investors with two earnings measurements (underlying earnings and IFRS earnings) where one is higher than the other (underlying earnings higher than IFRS earnings), when firms make current statutory losses or miss statutory earnings targets, investors are affected more by managers' opportunistic underlying earnings reporting behaviour. This is because prospect theory suggests that decision makers depend on

⁵ Earnings target is measured by current statutory earnings less than previous statutory earnings.

references and will frame decisions on perceived gains rather than losses, the price of firms will increase.

Figure 3: Flow chart of theoretical framework for opportunistic underlying earnings reporting based on prospect theory and agency theory

Although this paper assumes that managers opportunistically use income-increasing underlying earnings exclusions to influence investors' perception of firm performance, the first step is to confirm whether this assumption is true or not. Given the debates on non-statutory earnings reporting behaviour, it is reasonable to ask whether the exclusions are unimportant, non-recurring, and value-irrelevant to investors. If the income-increasing exclusions contain recurring expenses that can be used to determine future earnings and these income-increasing exclusions will be realised in future earnings, then it can be concluded that managers opportunistically define underlying earnings as being higher than statutory earnings to make to influence investors' judgments of firm value. The second hypothesis in this thesis states that underlying earnings are opportunistically manipulated by managers; it is stated as follows:

H2: The recurring expenses included in income-increasing underlying earnings exclusions are realised in future earnings.

Based on prospect theory and agency theory, when firms do not meet the IFRS earnings target or make IFRS losses, managers have an incentive to use income-increasing underlying earnings exclusions to make firm performance more favourable. This thesis therefore states the following hypotheses:

H3a: When firms do not meet the IFRS earnings target, they are more likely to use income-increasing underlying earnings exclusions to make underlying earnings higher than IFRS earnings.

H3b: When firms make IFRS losses, firms are more likely to use income-increasing underlying earnings exclusions to make underlying earnings higher than IFRS earnings.

2.3.6 Market reactions to underlying earnings reporting

Market reactions to either underlying earnings or statutory earnings depend on how it is processed by market participants. If reported efficiently, the evidence suggests that manager's report non-statutory earnings to reflect the 'core earnings' of a firm and the market reacts positively on non-statutory earnings reporting (e.g., Bradshaw & Sloan, 2002; Bhattacharya et al., 2003; Brown & Sivakumar, 2003). However, the evidence for opportunistic reporting is mixed because on one hand it shows that investors can 'see through' opportunistic reporting made by managers and thus react negatively to non-statutory earnings (e.g., Black et al., 2014; Curtis et al., 2014; Lougee & Marquardt, 2004), while on the other, evidence exists that investors can be misled by managers' opportunistic reporting and misprice firm value (e.g., Doyle et al., 2003; Landsman et al., 2007). Since the influence of underlying earnings on stock prices is unspecified, this paper states the market reactions hypothesis in null form:

H4: Underlying earnings are not related to the stock prices.

2.4 Research design

2.4.1 Data and sample selection

This study used ASX 200 firms from years 2009 to 2012 as the sampling frame. Information related to financial data was obtained from the DatAnalysis database supplemented by the Finanalysis database⁶. The underlying earnings data were hand-collected from the annual reports of ASX 200 firms. Following Dahmash et al. (2009) and Graham & King (2000), firms involved in banking, insurance, diversified financials, and real estate were excluded

⁶ FinAnalysis was expired in March of 2013 but still available until November of 2013 in the University of Wollongong database. After November of 2013, the data were collected from DatAnalysis database.

because they are subjected to different reporting requirements. ASX 200 firms were selected as the sample frame because the ASX 200 is recognised as the primary investment benchmark in Australia. ASX 200 firms cover approximately 78% of Australian equity market capitalisation (ASX announcement, 2011). This paper attempted to examine the post-IFRS period so the years 2006, 2007 and 2008 were avoided because the three years following the adoption of IFRS meant a lot of changes to financial reporting processes and systems in firms adopting IFRS standards for the first time in Australia. In order to collect the underlying earnings data, annual reports that are available in the Annual Reports Online database and DatAnalysis database were searched by typing the keywords ‘underlying’, ‘adjusted’, ‘normalised’, ‘earnings before’, ‘profit before’, and ‘pro forma’. Following Black & Christensen (2009), EBIT or EBITDA were not included because they are commonly reported as standard steps in the income statement. The detailed sample selection process is shown in table 1. There were 107 out of 153 firms that reported underlying earnings at least once during the study periods (2009-2012). In total, 321 firm-year observations in the sample disclosed underlying earnings over four observation years. Table 2 shows the sample industry distribution based on the Global Industry Classification Standard (GICS) sector. ‘Materials’ is the largest sample industry comprising 28% of total sample industries, followed by the industrials sector that constitutes 22% of all sample industries.

Table 1: Sample selection

Sample selection		
	Number of firms	Firm-year observations
Top ASX200 firms	200	800
<i>Exclusions:</i>		
Banks	6	24
Insurance	4	16
Diversified financials	9	36
Real estate	19	76
No annual reports variable	9	36 ⁷
Final group investigated	153	612
Underlying earnings disclosures	107	321

Table 2: Industry distribution

Industry distribution			
	Number of firms	Firm-year observations	Percentage (%)
Consumer discretionary	31	124	20%
Energy	18	72	12%
Health care	11	44	7%
Industrials	33	132	22%
Materials	44	176	28%
Software&Services	3	12	2%
Telecommunication Services	6	24	4%
Utilities	7	28	5%
Total	153	612	100%

⁷ This paper has deleted the firms that do not have four years annual reports from 2009 to 2012. They are Aurizon Holdings Limited; Carsales. Com Limited; Echo Entertainment Group Limited; Maverick Drilling and Exploration Limited; Treasury Wine Estates Limited; Trade Me Group Limited; Macquarie Atlas Roads Group; Alacer Gold Corporation and Myer Holdings Limited.

2.4.2 Testing efficient reporting (H1)

Only one paper has examined the recurrence of statutory earnings on the probability of pro forma earnings reporting. These recurring statutory earnings are measured by the earnings persistence of earnings quality attributes. The authors found no economically significant relationship between GAAP earnings persistence and the probability of firms reporting pro forma earnings. The results doubt managers' assertions that they report pro forma earnings because GAAP earnings show less persistence (Johnson & Schwartz, 2005). This paper expanded Johnson & Schwartz (2005)'s study to measure recurring statutory earnings using two earnings quality attributes: earnings persistence and earnings predictability, to test H1.

2.4.2.1 Earnings persistence

As the earnings quality construct, persistence is derived from a value relevance perspective (Beneish & Vargus, 2002; Mohammady, 2010; Penman & Zhang, 2002). Persistence earnings are studied under the context of 'sustainable' or 'core earnings' and will have better inputs into models of equity valuation (e.g., Dechow, 2004; Dechow et al., 2010; Kormendi & Lipe, 1987; Schipper & Vincent, 2003). A high persistence earnings number is one of high-quality earnings that accurately shows the operating performance of a firm, and as such is a good indicator of future operating performance (Dechow, 2004; Merton & Rock, 1985; Schipper & Vincent, 2003).

This study approximates earnings persistence using Kormendi & Lipe' (1987) model, where a future period is considered to be the current reporting period, and the current period is considered to be the previous reporting period, as follows:

$$E_{j,t} = \alpha_0 + \alpha_1 E_{j,t-1} + v_{j,t} \quad (1)$$

Where: $E_{j,t}$, measured as firm j 's earnings before tax in year t divided by total assets for year $t-1$;

$E_{j,t-1}$, measured as firm j 's earnings before tax in year $t-1$ divided by total assets for year $t-1$;

$v_{j,t}$ —residual;

j —firm observations;

t —years from 2005 to 2012.

Earnings persistence is measured by the slope coefficient from Equation (1) using a 5-year rolling window ending in year 2012 for firm j , year t ⁸. High values imply more persistent (high quality) earnings, while low values indicate more transitory (low quality) earnings (Kormendi & Lipe, 1987).

2.4.2.2 Earnings predictability

Persistence is perceived as the degree to which earnings performance persists into the next period (Dechow, 1994). However, a dilemma for researchers is that persisting into the next period's earnings is not equivalent to predicting the stream of future cash flows (Dechow et al., 2010). If the variance (e.g., the absolute magnitude) of a typical shock to the series is large, highly persistent earnings will have low predictive ability, and therefore earnings with high quality on the persistence construct may have low quality on the predictive ability construct (Schipper & Vincent, 2003).

⁸ As the time-series regression models need at least 5 years data in a firm and also this paper attempts to examine the quality of post-IFRS earnings, so it starts in 2005 and uses 5-year rolling window to calculate the earnings persistence and earnings predictability.

Researchers refer specifically to predictive ability as ‘the ability of past earnings to predict future earnings’ (Lipe, 1990), so predictive ability is linked to a specific task. Information about future earnings is needed by investors because their investment is the present value of future earnings that will be generated by the firm in which they invest. Furthermore, the power of a firm to create earnings can be shown in the market value of its equity, so the prediction of future earnings helps to predict stock returns (Schipper & Vincent, 2003). Collectively, the predictive value is a significant part of the decision making process and plays a critical role in investment decisions. Hence, earnings predictability is used in this thesis as another earnings quality attribute to assess recurring statutory earnings.

Following a previous study (e.g., Francis et al., 2004; Lipe, 1990; Schipper & Vincent, 2003), this study defines earnings predictability as information in the earnings number that tends to repeat into future periods and indicates high quality earnings. This study uses Lipe’s (1990) multivariate model to measure earnings predictability, which is measured as a standard deviation of the residuals from the earnings persistence multivariate model (i.e., Equation (1)) using a 5-year rolling window ending in year 2012 for firm j , year t . A high value indicates low earnings predictability.

$$\text{Predictability} = \sqrt{\sigma^2(\widehat{v}_j, t)} \quad (2)$$

2.4.2.3 Empirical model for testing H1

$$UE_{j,t} = a_0 + a_1 \text{Persis}_{j,t} / \text{Pred}_{j,t} + a_2 \text{Controls}_{j,t} + \text{Year effects} + \text{Industry effects} + e_{j,t} \quad (3)$$

Where: j is firm observations, and t is years from 2009 to 2012.

Dependent variable: $UE_{j,t}$ is dummy variable that equals 1 if j firm discloses a underlying earnings number in year t , and zero otherwise.

Independent variables: $Persis_{j,t}$ is measured by the slope coefficient from Equation (1) using a 5-year rolling window ending in year 2012 for firm j , year t . $Pred_{j,t}$ is measured by the residuals of Equation (1) using a 5-year rolling window ending in year 2012 for firm j , year t .

Detailed explanations of control variables are discussed in section 2.4.4.

2.4.3 Testing opportunistic reporting (H2, H3a & H3b)

2.4.3.1 Persistence of income-increasing underlying earnings exclusions (H2)

Doyle et al. (2003) have found that adjustments made by managers to define the non-GAAP earnings are not completely transitory because recurring items are then realised in future cash flows. This result was confirmed by Frankel et al.'s (2011) study. However, both of these studies examined the persistence of non-GAAP exclusions using total exclusions measured by pro forma EPS minus GAAP EPS, and total non-GAAP exclusions include income-decreasing and income-increasing exclusions. The assumption of opportunistic reporting in this paper assumes that when firms do not meet IFRS earnings target and make IFRS losses, they are more likely to use income-increasing underlying earnings exclusions opportunistically to make it more favourable than IFRS earnings in order to influence investors' perceptions. Therefore, unlike Frankel et al. (2011) and Doyle et al. (2003)'s studies, this paper examines the persistence of income-increasing underlying earnings exclusions rather than total exclusions to test H2. If income-increasing exclusions (positive exclusions) are presented faithfully by managers, where positive exclusions are deemed to be value irrelevant, then positive exclusions should not relate to future operating earnings, but if positive exclusions include information that is useful for future earnings, then the relationship

between future operating earnings and positive exclusions should be related because the usefulness of these exclusions are realised in future years. This paper also extends extant non-statutory earnings literature by investigating the persistence of eight individual adjustments made by managers to achieve underlying earnings for the sample of firm-year observations that reports underlying earnings higher than IFRS earnings.

Empirical model for testing H2:

$$OE_{j,t+1to2} = a_0 + a_1 InEx_{j,t} / IndADJ_{j,t} + a_2 Controls_{j,t} + Year\ effects + Industry\ effects + v_{j,t} \quad (4)$$

Where: j is firm observations, and t is years from 2009 to 2012.

Dependent variable: the one-year ahead operating earnings⁹ and sum of two-years ahead operating earnings, scaled by total assets at the beginning of year t.

Independent variable: $InEx_{j,t}$ is designed to detect the decision by management to use income-increasing underlying earnings exclusions, but if the underlying earnings exceed the statutory earnings then $InEx_{j,t}$ is equal to one, or zero otherwise; $IndADJ_{j,t}$ represents eight dummy variables that equal to one if managers excluded any of the following eight individual adjustments, or zero otherwise¹⁰. The eight individual adjustments are (1) impairment or revaluation of assets ($IR_{j,t}$), (2) tax or interest effects ($TI_{j,t}$), (3) losses on asset dispositions or investments ($GLA_{j,t}$), (4) redundancies and restructuring costs ($RC_{j,t}$), (5) merge or demerge

⁹ Doyle et al. (2003) used future cash flows as dependent variables. However, this dependent variable is less accurately in evaluating the persistence of adjustment as current liabilities have implications on future cash flow (Kolev et al., 2008). Future statutory before tax also as dependent variables also is less desirable as statutory before tax often includes expenses that are excluded from non-statutory profit resulting in the systematic relation that does not reflect opportunism (Frankel et al., 2011).

¹⁰ This study only includes the expenses adjustments as it focuses on the income increasing exclusions.

and acquisition transaction costs ($MAC_{j,t}$), (6) foreign exchange loss ($FGL_{j,t}$), (7) equity accounting ($Equity_{j,t}$), (8) all other unspecified adjustments ($Other_{j,t}$).

Control variables are discussed in detail in section 2.4.4.

2.4.3.2 Earnings target, earnings losses, and underlying earnings reporting (H3a&H3b)

Following Lougee & Marquardt (2004), this paper uses previous year earnings before tax at the end of the financial year as a proxy for earnings target. Firm that generated earnings before tax at the end of the current financial year that equal or exceed the earnings before tax of the previous year represents managers that have met their earnings target; they are coded as one, or zero otherwise. This paper defines $Loss_{j,t}$ as a dummy variable that equals 1 if j firm made statutory losses in year t , and zero otherwise.

The empirical model to test H3a and H3b is designed as follows:

$$InEx_{j,t} = a_0 + a_1 Meet_{j,t} / Loss_{j,t} + a_2 Controls_{j,t} + Year\ effects + Industry\ effects + e_{j,t} \quad (5)$$

Where: j is firm observations. t is years from 2009 to 2012.

Dependent variable: $InEx_{j,t}$ is designed to detect the decision by management to use income-increasing exclusions. If underlying earnings exceeds statutory earnings, then $InEx_{j,t}$ equals to one, or zero otherwise.

Independent variables: $Meet_{j,t}$ is a dummy variable that equals 1 if j firm's earnings before tax in year t is greater than or equal to earnings before tax in year $t-1$, and zero otherwise. $Loss_{j,t}$ is a dummy variable that equals 1 if j firm made statutory losses in year t , and zero otherwise.

2.4.4 Control variables for efficient and opportunistic reporting

Following the literature, this paper includes several additional measures that would influence the likelihood of variables affecting reporting behaviour. These control variables include the leverage ratio, market to book ratio, sales growth, earnings variability, and return on equity, net operating assets, capital intensity, and firm size.

Leverage ratio: studies found that when firms close to the debt-to-equity ratio, investors consider earnings to be low earnings quality because of an increased likelihood of firm failure and an enhanced probability of earnings management, and therefore firms are more likely to make voluntary disclosure (e.g., Lougee & Marquardt, 2004). Other literature suggests that higher leverage shows a firm is closer to a restriction of debt covenant where managers are highly motivated to manipulate earnings upwards to prevent them from violating a covenant (e.g., DeFond & Jiambalvo, 1994; Watts & Zimmerman, 1986). This paper includes the leverage ratio ($Leverage_{j,t}$) as a control variable measured by short-term and long-term debt divided by total assets for firm j , in year t .

Growth rate: Frenkel et al. (2011) stated that growth can act as a correlated or omitted variable if it is associated with the persistence of non-GAAP exclusions, so this paper includes growth as a control variable. The value of firms with a high growth rate is more difficult to evaluate based on historical earnings alone because their value tends to be a function of intangible 'growth options' (Myers, 1977). Lev & Zarowin (1999) have found

that in rapidly changing economic industries, the value and relevance of financial information to users is much lower than it is in steady industries, so they argued that firms with rapid growth are more likely to make voluntary disclosures. However, other studies found that firms with high growth rates are less likely to increase earnings for opportunistic purposes (e.g., Farrell et al., 2013). Similar to Tasker (1998) and Lougee & Marquardt (2004), growth rates are measured using sales growth rate ($SalesG_{j,t}$) and market-to-book ratio ($MtoB_{j,t}$). Here, $SalesG_{j,t}$ is measured by sales for firm j , year t minus the sales for firm j , in year $t-1$, then divided by the sales for firm j , in year t , and $MtoB_{j,t}$ is measured by the market value of equity divided by the book value of equity for firm j , in year t .

Statutory earnings variability: when earnings patterns exhibit a high level of variability from one period of time to another, investors could perceive earnings with lower quality, which generates a demand for additional information to help them interpret earnings information (Lougee & Marquardt, 2004). According to literature, analysts tend to forecast cash flows when earnings variability is high because the magnitude of earnings volatility lowers earnings quality which then increases the probability of managers making voluntary disclosures (e.g., Hayn, 1995; Dechow & Dichev, 2002; DeFond & Hung, 2003; Francis et al., 2004; Lougee & Marquardt, 2004; Dichev & Tang, 2008; Frankel et al., 2011). This study includes the earnings variability ($SDE_{j,t}$) as a control variable, where $SDE_{j,t}$ is measured by standard deviation of statutory earnings before tax scaled by beginning total assets of the firm, computed using a 5-year rolling window ending in 2012 for firm j , year t .

Firms' profitability: studies found that a weak performance provides an incentive for managers to make earnings management (e.g., Petroni, 1992; DeAngelo et al., 1994; Balsam et al., 1995; Doyle et al., 2007a; Brown & Caylor, 2005; Doyle et al., 2013). Other

studies argued that earnings management firms are likely to exhibit a high profitability because it affects job security and the compensation contract of managers (e.g., Degeorge et al, 1999; Fudenberg & Tirole, 1995; Sun & Rath, 2012). This paper controls firms' profitability using the return on equity ratio ($ROE_{j,t}$) that is measured by earnings before tax divided by the average shareholders' equity for firm j , in year t .

Net operating assets: firms are less likely to meet or beat analysts' expectations when the net operating assets are high because on a balance sheet they partially show the extent of prior earnings management activates and proxies for managers' constraints in utilising within-statutory earnings management (Doyle et al., 2013). Barton & Simko (2002) and Baber et al. (2011) stated that balance sheets restrict future earnings management by showing that firms with bloated balance sheets tend to miss earnings forecasts. Hirshleifer et al. (2004) proved that net operating assets are proxy for a bloated balance sheet, and are a powerful negative predictor for long-run stock returns. Ettredge et al. (2010) supported that net operating assets is an important variable in explaining the use of earnings management. This study includes net operating assets at the beginning of year as a control variable because previous net operating assets (balance sheet constrains) influence current managers' decision to use earnings management (Badertscher, 2011). Net operating assets at the beginning of year ($NOA_{j,t}$) are measured by shareholders' equity less cash, and cash equivalent plus total debt divided by lagged sales for firm j , at the beginning of the year t .

Capital intensity: consistent with the view that capital-intensive firms have greater volatility in earnings due to higher operating leverage and more capital-intensive firms have less persistent earnings than less capital-intensive firms (Baginski et al., 1999; Lev, 1983; Francis et al., 2004). This paper includes the capital intensity ($Capital_{j,t}$) as a control variable

measured by the ratio of net book value of Property, Plant, and Equipment (PPE) to total assets for firm j , in year t .

Following previous pro forma reporting literature (e.g., Lougee & Marquardt, 2004; Black & Christensen, 2009; Hsu & Kross, 2011; Doyle et al., 2013; Black et al., 2014; Choi & Young, 2015), this study includes firm size ($Size_{j,t}$) in the efficient and opportunistic multivariate models as a control variable. Thus $Size_{j,t}$ is measured by the natural logarithm of total assets for firm j , at the beginning of year t .

Year and industry effects: this thesis uses the panel data that meets the cross-sectional firms observed, and at least once more over the observed years from 2009 to 2012. Thus, year industry fixed-effects regression models are applied to control for the unobservable variables. For year effects, 3 dummy variables are generated (year 2010=1, and others zero; year 2011=1, and others zero; year 2012=1, and others zero) to control for the unobservable confounding variables that differ from time to time, but are constant across the industries. Year 2009 is dropped by Stata software because the fixed effects model includes a constant. For industry effects, 7 dummy variables are generated (energy=1, and others zero; materials=1, and others zero; industrials=1, and others zero; health care=1, and others zero; software & services=1, and others zero; telecommunication services=1, and others zero; utilities=1, and others zero) to control for the unobservable confounding variables that differ across industries, but are constant over time. Consumer discretionary is dropped by Stata software because the fixed effects model includes a constant.

2.4.5 Testing market reactions (H4)

Under Statement of Financial Accounting Concepts (SFAC) No. 5 (FASB, 1984), accounting information is relevant if it can make a difference to decisions made by users of financial statements. Under the AASB Framework, information is regarded as relevant if it ‘influences the economic decisions of users by helping them evaluate past, present, or future events, or confirming or correcting their past evaluations’ (paragraph 26). For this information to be relevant it should have predictive value and feedback value, where the latter refers to whether the information confirms or corrects earlier expectations (Deegan, 2010 p.57). Therefore, whether an investor reacts to accounting information depends on its value relevance because it is a major indicator of the quality of financial reporting; another important indicator is reliability. The AASB Framework states that information is deemed to be reliable if it is ‘free from material bias and error and can be depended upon by users to faithfully represent the underlying items it claims to represent’ (paragraph 31). The value-relevant accounting information may be unreliable because managers can influence investors’ economic decision making by misrepresenting information.

Three types of value-relevant models are found in literature: the balance sheet model, the earnings model, and the residual income valuation model (or Ohlson (1995)’s model) (Holthausen & Watts, 2001).

The balance sheet model assumes that the market value of equity should include information pertaining to the market value of separable assets, the market value of separable liabilities, and the market value of the balance sheet component (Holthausen & Watts, 2001). The problem with this model is that it contains correlated and omitted variables because it requires the inclusion of all market values of liability and asset, but some of them cannot be captured appropriately (e.g., IC) (see, Lys, 1996, p. 161). Several studies recognise that if the

included values are associated with the omitted values, the estimated coefficients of these included values can be biased from their predicted values (Holthausen & Watts, 2001, p.56).

The earnings model defines accounting earnings as value relevance to the market because it should explain the information that is impounded in stock returns. Therefore, value relevance is the ability of one or more accounting earnings to explain variations in stock returns (Francis et al., 2006). In the earnings model studies, stock returns are often regressed on alternative measures of earnings such that the coefficients of earnings and returns, and R squares are perceived to be indicators of value relevance. The highest coefficients and R squares are considered to be the most value-relevant or best measure of performance. The earnings model is widely used in value relevance literature (e.g., Dhaliwal et al., 1999, Barth & Clinch, 1996; Francis et al., 2006) even though it has a timing problem, because earnings includes cash flows in periods other than those in which they occur. This timing problem results in the prediction for coefficient of earnings and returns is incorrect for the firms with long investment cycles and cash flow cycles (Dechow, 1994; Holthausen & Watts, 2001).

A model that is frequently used in value relevance literature is the residual income valuation model developed by Ohlson (1995) and refined by Feltham & Ohlson (1995; 1996). This model permits imperfect product markets for a finite number of periods and it links market values of equity of a firm to its abnormal earnings, net book values and other information (Barth et al., 2001). Abnormal earnings in this model includes current earnings and potential future earnings (Reuters, 2008), which potentially reduce the timing problem in the earnings model (Holthausen & Watts, 2001).

This paper uses Ohlson's (1995) model to examine market reactions and also follows Ahmed & Falk (2006) who stated that Australian firms normally take three months to release financial statements, so firm's stock prices are measured three months after the financial year

ends because it takes that long for annual reports to be released and inform shareholders about the accounting information reported in annual reports.

The value-relevant of earnings is measured by the following regression model:

Value-relevant model:

$$\text{Stock}_{j,t} = \text{EARPS}_{j,t} + \text{AUEPS}_{j,t} + \text{BVEPS}_{j,t} + \text{MktCap}_{j,t} + \text{MtoB}_{j,t} + \text{Year effects} + \text{Industry effects} + e_{j,t} \quad (6)$$

Where: j is firm observations, and t is the years from 2009 to 2012.

Dependent variable: $\text{Stock}_{j,t}$ is the stock price for firm j , three months after the financial year t .

Independent variables: $\text{AUEPS}_{j,t}$ is the actual underlying earnings divided by the number of shares outstanding for firm j , in year t . Two sub-samples will be tested: the sample observations that report the actual value of underlying earnings and the sample observations that reported the actual value of underlying earnings is greater than the reported statutory earnings.

$\text{EARPS}_{j,t}$ is measured by statutory earnings that compare to underlying earnings (e.g., if firms reported underlying earnings before interest and tax, then statutory earnings before interest and tax is selected for comparison) divided by the number of outstanding shares for firm j , year t .

Control variables: $\text{BVEPS}_{j,t}$ is the book value of equity divided by the number of shares outstanding for firm j , in year t ; $\text{MtoB}_{j,t}$ is the market-to-book equity ratio, measured as the market value of equity divided by the book value of equity for firm j , in year t (e.g.,

Dzinkowski, 2000; Lundholm & Myers, 2002); $MktCap_{j,t}$ is the size of the firm, measured as a natural logarithm of market capitalisation for firm j , at the beginning of year t (e.g., Lundholm & Myers, 2002; Ettredge et al., 2005; Abeysekera, 2011). Year and industry effects are also included as control variables in Equation (6). For year effects, 3 dummy variables are generated (year 2010=1, and others zero; year 2011=1, and others zero; year 2012=1, and others zero) to control for the unobservable confounding variables that differ from time to time, but are constant across the industries. Year 2009 is dropped by Stata software because the fixed effects model includes a constant. For industry effects, 7 dummy variables are generated (energy=1, and others zero; materials =1, and others zero; industrials=1, and others zero; health care=1, and others zero; software & services=1, and others zero; telecommunication services=1, and others zero; utilities=1, and others zero) to control for the unobservable confounding variables that differ across industries, but are constant over time. Consumer discretionary is dropped by Stata software because the fixed effects model includes a constant.

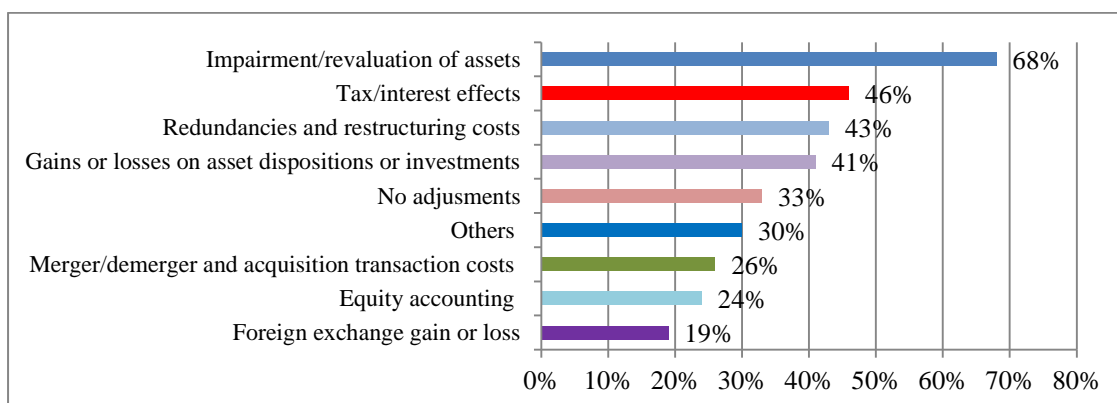
2.5 Analyses and results

2.5.1 Status of current underlying earnings reporting

Figure 4 shows the categories of adjustments made in calculating underlying earnings by managers. Of the 321 firm-year observations that reported underlying earnings, 216 firm-year observations that presented adjustments are excluded from statutory earnings to achieve underlying earnings. There are eight common adjustments to statutory earnings when calculating the underlying earnings found in this thesis: (1) impairment or revaluation of assets, (2) tax or interest effects, (3) gain or losses on asset dispositions or investments, (4)

redundancies and restructuring costs, (5) merge or demerge and acquisition transaction costs, (6) foreign exchange gain or loss, (7) equity accounting, (8) all other unspecified adjustments. Of the eight adjustments, impairment or revaluation of assets accounts for 68% of total adjustments. Tax and interest-related items are ranked as second (46% of total adjustments), followed by redundancies and restructuring costs that accounted for 43% of total underlying earnings adjustments, and 33% of firm-year observations do not present any adjustments in the sample.

Figure 4: Underlying earnings adjustments



This thesis finds that underlying earnings can have six impacts. First, firms report underlying earnings to reduce their statutory loss (decrease the loss). Second, firms report underlying earnings to decrease the profit of statutory earnings (decrease the profit). Third, firms report underlying earnings to increase the profit of statutory earnings (increase the profit). Fourth, firms report underlying earnings to convert statutory loss to a positive figure (convert loss to profit). Fifth, firms report underlying earnings the same as statutory earnings (no change). Sixth, firms report underlying earnings to increase statutory loss (increase loss). Figure 5

shows that most firms in the sample who reported their underlying earnings posted a more favourable figure during the four year period. Based on this sample, 220 out of 321 firm-year observations reported underlying earnings higher than statutory earnings by either decreasing statutory loss and increasing statutory profit, or converting statutory loss and reporting it as underlying profit. There are 82 observations that reported underlying earnings by either decreasing statutory profit or increasing statutory loss.

Figure 5: Impacts of underlying earnings on statutory earnings

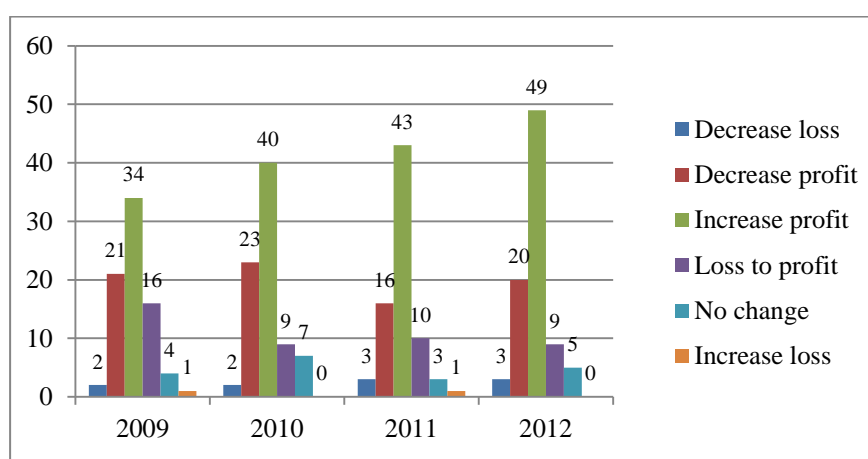
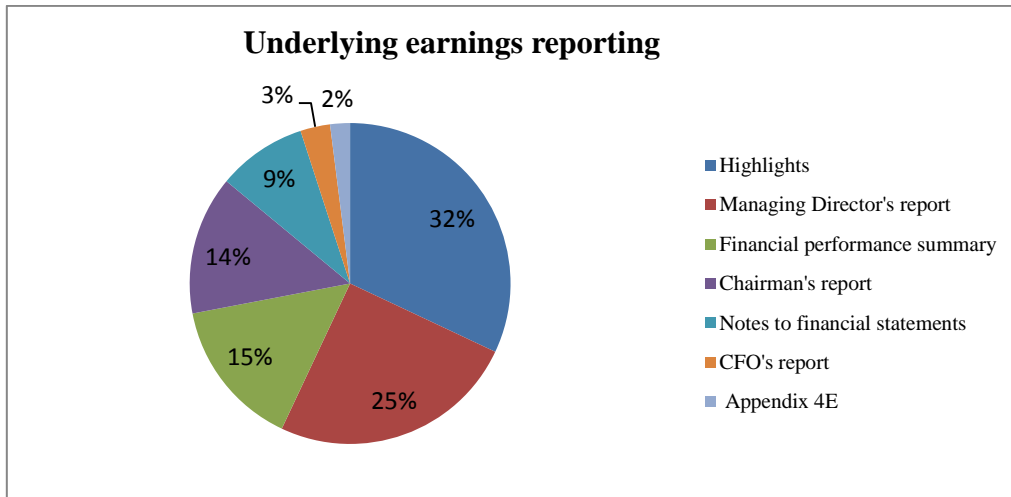


Figure 6 shows the locations where underlying earnings are presented. This thesis finds seven locations where underlying earnings are presented, i.e., the financial highlights section, the managing director's report section, the financial performance summary section, the chairman's report section, notes to financial statements, the Chief Financial Officer (CFO)'s report, and appendix 4E. Figure 6 shows that most underlying earnings reporting (32% out of 100%) is in the front of annual reports and is highlighted by reporting firms. This is followed by the managing directors' report, which comprises 25% of the seven locations in the sample. The detailed current underlying earnings reporting status is presented in Appendix section 2.

Figure 6: Locations of underlying earnings reporting



2.5.2 Descriptive statistics of variables for paper one

Table 3 presents the summary statistics of variables for the sample. Panel A of table 3 shows the descriptive statistics of variables for opportunistic and efficient reporting hypotheses. To obtain the values of earnings persistence and earnings predictability, a 5-year window that continues rolling for five years with firm-specific observations must be used, although this requirement reduced the number of observations to 566. In order to make a comparison, this paper presents the descriptive statistics for two sub-samples: the firm-year observations that report underlying earnings as higher than statutory earnings (firms that use income-increasing underlying earnings exclusions) and all other firm-year observations. The mean of $Pred_{j,t}$ for reporting income-increasing exclusions are much lower than the mean $Pred_{j,t}$ for all other observations ($t=-4.440$, $p\text{-value}=0.000$), which suggests that the predictability of statutory

earnings for those income-increasing underlying earnings exclusions reporters are higher than the predictability of statutory earnings for other observations (high values of $Pred_{j,t}$ represent low earnings predictability). It rejects managers' assertion that they disclose underlying earnings because of the low earnings predictability of statutory earnings. The mean of $Meet_{j,t}$ for income-increasing underlying earnings exclusions reporters is lower than the mean of $Meet_{j,t}$ for all other reporters ($t=-1.869$, $p\text{-value}=0.062$). The mean of $Loss_{j,t}$ for income-increasing underlying earnings exclusions reporters is much higher than the mean of $Loss_{j,t}$ for all other reporters ($t=1.977$, $p\text{-value}=0.049$). The t-test results suggest that the income-increasing underlying earnings exclusions reporters are those who do not meet earnings targets and make current statutory losses. Compare to all other reporters, the income-increasing underlying earnings exclusions reporters are those with a lower market-to-book ratio ($MtoB_{j,t}$) ($t=-3.705$, $p\text{-value}=0.000$), have lower rates of sales growth ($SalesG_{j,t}$) ($t=-2.502$, $p\text{-value}=0.013$), have a larger firm size ($Size_{j,t}$) ($t=8.742$, $p\text{-value}=0.000$), have higher leverage ratios ($Leverage_{j,t}$) ($t=2.000$, $p\text{-value}=0.046$), have higher returns on equity ($ROE_{j,t}$) ($t=2.085$, $p\text{-value}=0.038$), have higher operating net assets ($NOA_{j,t}$) ($t=1.464$, $p=0.072$), have more intensive capital ($Capital_{j,t}$) ($t=3.987$, $p=0.000$) and have lower earnings variability ($SDE_{j,t}$) ($t=-5.552$, $p\text{-value}=0.000$), on average.

Panel B of table 3 shows the descriptive statistics of variables for market reactions. Since there are missing financial data in the database, the sample size was reduced to 610 firm-year observations for the market reactions model¹¹. The mean of stock price ($Stock_{j,t}$) is higher for income-increasing underlying earnings exclusions reporters than other reporters ($t=2.705$, $p\text{-value}=0.007$) suggesting that market reacts favourable to underlying earnings when the underlying earnings is greater than the statutory earnings. Moreover, the panel B of table 3 finds that the mean of the

¹¹ The information about Dulux Group Limited in year 2009 and 2010 are missing.

book value of equity per share ($BVEPS_{j,t}$) is higher for income-increasing underlying earnings exclusions reporters than other reporters ($t=1.674$, $p\text{-value}=0.094$), and there is no statistically difference between the mean of earnings per share for income-increasing exclusions reporters and other reporters.

Table 3: Descriptive statistics for underlying reporting and market reaction variables

Table 3 Panel A: Descriptive statistics for opportunistic and efficient hypotheses

Variable	All observations (N ¹² =566)			Income-increasing underlying earnings exclusions (N=204)			All other observations (N=362)			Mean test between income-increasing underlying earnings exclusions and all other observations	
	Mean	Median	Std. dev	Mean	Median	Std. dev	Mean	Median	Std. dev	T-test	p-Value
<u>Variables of Interest:</u>											
Persis _{j,t}	0.487	0.483	0.600	0.477	0.484	0.595	0.492	0.483	0.604	-0.295	0.768
Pred _{j,t}	0.142	0.058	0.319	0.080	0.042	0.110	0.176	0.069	0.386	-4.440***	0.000
Meet _{j,t}	0.634	1.000	0.482	0.583	1.000	0.494	0.663	1.000	0.473	-1.869*	0.062
Loss _{j,t}	0.208	0.000	0.407	0.255	0.000	0.437	0.182	0.000	0.387	1.977**	0.049
<u>Control Variables</u>											
MtoB _{j,t}	2.904	1.942	3.714	2.143	1.478	3.665	3.333	2.249	3.677	-3.705***	0.000
ROE _{j,t}	0.128	0.119	0.318	0.167	0.118	0.362	0.106	0.119	0.289	2.085**	0.038
SDE _{j,t}	0.138	0.065	0.268	0.074	0.047	0.083	0.174	0.083	0.325	-5.552***	0.000
Leverage _{j,t}	0.246	0.212	0.285	0.281	0.254	0.343	0.226	0.193	0.245	2.000**	0.046
NOA _{j,t}	0.779	0.724	0.662	0.840	0.734	0.843	0.744	0.714	0.533	1.464*	0.072
Size _{j,t}	7.175	7.309	1.826	7.941	8.134	1.442	6.744	6.697	1.879	8.472***	0.000
Capital _{j,t}	3.796	3.927	0.932	4.006	4.135	0.969	3.678	3.699	0.890	3.987***	0.000
SalesG _{j,t}	0.097	0.036	0.267	0.061	0.026	0.260	0.119	0.050	0.269	-2.502**	0.013

¹² Number of observations

Table 3: Descriptive statistics for underlying reporting variables and market reaction variables (continued)

Panel B: Descriptive statistics for market reaction

Variable	All observations (N=610)			Income-increasing underlying earnings exclusions (N=218)			All other observations (N=392)			Mean test between income-increasing underlying earnings exclusions and all other observations	
	Mean	Median	Std. Dev	Mean	Median	Std. dev	Mean	Median	Std. dev	T-test	p-Value
<u>Variables of Interest:</u>											
Stock _{j,t}	0.584	0.335	0.779	0.718	0.346	1.065	0.509	0.331	0.548	2.705***	0.007
EPS _{j,t}	0.590	0.280	1.043	¹³ 0.672	0.313	1.252	0.545	0.263	0.904	1.316	0.188
BVEPS _{j,t}	3.278	1.747	4.344	3.911	2.107	4.828	2.584	1.321	3.627	1.674*	0.094
<u>Control Variables:</u>											
MtoB _{j,t}	2.876	1.912	3.631	2.193	1.496	3.630	3.256	2.213	3.579	-3.481***	0.000
MktCap _{j,t}	7.188	7.145	1.605	7.598	7.557	1.346	6.961	6.962	1.692	5.097***	0.000

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Persis_{j,t} is earnings persistence of firm j, in year t. Pred_{j,t} is earnings predictability of firm j, in year t. Meet_{j,t} is dummy variable that equals 1 if j firm's earnings before tax in year t is greater than or equal to earnings before tax in year t-1, and zero otherwise. Loss_{j,t} is a dummy variable that equals 1 if j firm made statutory losses in year t, and zero otherwise. MtoB_{j,t} is measured by the market value of equity divided by the book value of equity for firm j, in year t. ROE_{j,t} is earnings before tax divided by average shareholders' equity for firm j, in year t. Size_{j,t} is measured by the natural logarithm of firm j's total assets, at beginning of year t. Leverage_{j,t} is measured by short-term and long-term debt divided by total assets for firm j, in year t. SDE_{j,t} is the standard deviation of earnings before tax scaled by beginning total assets of the firm, computed using a 5-year rolling window ending in year 2012 for firm j, year t. NOA_{j,t} is measured by shareholders' equity less cash and cash equivalent plus total debt divided by lagged sales for firm j, at the beginning of the year t. SalesG_{j,t} is the sales for firm j, year t minus the sales for firm j, in year t-1, then divided by the sales for firm j, in year t. Capital_{j,t} is measured by the ratio of net book value of property, plant, and equipment to total assets for firm j, in year t. Stock_{j,t} is stock price at last day of the third month of year t, for firm j. EPS_{j,t} is measured by statutory earnings before tax divided by the number of outstanding shares for firm j, in year t. BVEPS_{j,t} is book value of equity divided by the number of outstanding shares for firm j, in year t. MktCap_{j,t} is measured as the natural logarithm of the market capitalisation of the firm at the beginning of year t for firm j. p-values for means are based on two-tailed t-test.

¹³ EPS_{j,t} for underlying earnings reporting observations is measured by statutory earnings that compare to underlying earnings (e.g., if firms reported underlying earnings before interest and tax, then the statutory earnings before interest and tax is selected for comparison) divided by the number of outstanding shares for firm j, in year t (i.e., EARPS_{j,t} in Equation (6)). For non-underlying earnings reporting observations, the EPS_{j,t} is measured by statutory earnings before tax divided by the number of outstanding shares for firm j, in year t.

2.5.3 Pearson and Spearman correlations of variables for paper one

Because multicollinearity between the variables is a potential concern as a move to multivariate analysis, this paper presents both pearson and spearman correlations for the interested variables and control variables of paper one in Table 4. Previous authors suggest multicollinearity becomes a serious problem where correlations exceed 0.8 (e.g., Li & Mangena, 2014; Haniffa & Cooke, 2005). The correlation of each variable is less than 0.8, indicating that multicollinearity is not a major problem for the variables in this paper. Table 4 panel A shows the pearson and spearman correlations for variables of efficient and opportunistic reporting behaviour, with the result showing that the earnings persistence of statutory earnings ($Persis_{j,t}$) is not correlated to underlying earnings reporting ($UE_{j,t}$), which cast doubts about when statutory earnings show less persistence, managers are more likely to disclose underlying earnings. The earnings predictability of statutory earnings ($Pred_{j,t}$) is significantly and negatively correlated to underlying earnings reporting ($UE_{j,t}$) under spearman correlation (correlation=-0.169, p-value=0.000) and pearson correlation (correlation=-0.198, p-value=0.000) suggesting that when statutory earnings have high earnings predictability errors (i.e., low earnings predictability), firms are less likely to disclose underlying earnings. This result is opposite to management assertions that they disclose underlying earnings because statutory earnings are less predictable for future earnings. The $InEx_{j,t}$ is negatively correlated to $Meet_{j,t}$ and positively correlated to $Loss_{j,t}$ under both spearman and pearsom correlations, which suggests that when statutory earnings fail to meet earnings target or firms make current statutory losses, they are more likely to use income-increasing underlying earnings exclusions to make underlying earnings more profitable. The pearson and spearman correlations between the key variables confirm opportunistic underlying earnings reporting behaviour and suggest that when firms make

current losses or earnings decrease, they are more likely to disclose underlying earnings as being higher than statutory earnings. Table 4 panel B presents the pearson and spearman correlations for variables of market reactions only for the sample where firms report underlying earnings as being higher than statutory earnings. The result shows that underlying earnings and statutory earnings are significantly related to stock prices, but the correlation of actual underlying earnings ($AUEPS_{j,t}$) on stock prices ($Stock_{j,t}$) (spearman correlation=0.719; pearson correlation=0.673) is much higher than the correlation of statutory earnings ($EARPS_{j,t}$) on stock prices ($Stock_{j,t}$) (spearman correlation=0.293; pearson correlation=0.364), which suggests that investors price the underlying earnings higher than statutory earnings where firms use income-increasing underlying exclusions.

Table 4: Pearson and Spearman correlations for opportunistic and efficient hypotheses variables

Table 4 Panel A: pearson and spearman correlations for the variables of opportunistic and efficient reporting behaviours (566 firm-year observations)														
	UE _{j,t}	InEx _{j,t}	Persis _{j,t}	Pred _{j,t}	Meet _{j,t}	Loss _{j,t}	SDE _{j,t}	NOA _{j,t}	MtoB _{j,t}	SalesG _{j,t}	Capital _{j,t}	Leverage _{j,t}	ROE _{j,t}	Size _{j,t}
UE _{j,t}	1.000	0.717*** (0.000)	0.032 (0.452)	-0.198*** (0.000)	-0.035 (0.408)	-0.050 (0.238)	-0.245*** (0.000)	0.039 (0.349)	-0.258*** (0.000)	-0.147*** (0.000)	0.137*** (0.001)	0.111*** (0.009)	0.100** (0.018)	0.454*** (0.000)
InEx _{j,t}	0.717*** (0.000)	1.000	-0.012 (0.769)	-0.145*** (0.001)	-0.079* (0.059)	0.086** (0.041)	-0.179*** (0.000)	0.0482 (0.252)	-0.244*** (0.000)	-0.104** (0.014)	0.169*** (0.000)	0.092** (0.029)	0.093** (0.027)	0.315*** (0.000)
Persis _{j,t}	0.031 (0.458)	-0.022 (0.608)	1.000	-0.161*** (0.000)	0.123*** (0.003)	-0.086** (0.041)	-0.103** (0.014)	0.017 (0.691)	-0.012 (0.781)	0.012 (0.769)	-0.086** (0.042)	0.004 (0.928)	0.060 (0.152)	0.026 (0.535)
Pred _{j,t}	-0.169*** (0.000)	-0.134*** (0.002)	-0.256*** (0.000)	1.000	-0.061 (0.149)	0.213*** (0.000)	0.094*** (0.000)	0.028 (0.504)	0.237*** (0.000)	0.058 (0.168)	-0.208*** (0.000)	0.072* (0.087)	-0.111*** (0.008)	-0.359*** (0.000)
Meet _{j,t}	-0.035 (0.408)	-0.079* (0.059)	0.130*** (0.002)	-0.125*** (0.003)	1.000	-0.342*** (0.000)	-0.072* (0.088)	0.010 (0.816)	0.021 (0.617)	0.338*** (0.000)	0.009 (0.824)	0.069 (0.103)	0.189*** (0.000)	-0.028 (0.505)
Loss _{j,t}	-0.050 (0.238)	0.086** (0.041)	-0.089** (0.034)	0.212*** (0.000)	-0.342*** (0.000)	1.000	0.232*** (0.000)	0.006 (0.892)	0.053 (0.209)	-0.152*** (0.000)	0.038 (0.367)	-0.080* (0.057)	-0.345*** (0.000)	-0.198*** (0.000)
SDE _{j,t}	-0.358*** (0.000)	-0.270*** (0.000)	-0.070* (0.098)	0.781*** (0.000)	-0.071* (0.092)	0.227*** (0.000)	1.000	0.001 (0.996)	0.213*** (0.000)	0.037 (0.377)	-0.204*** (0.000)	0.020 (0.632)	-0.144*** (0.001)	-0.405*** (0.000)
NOA _{j,t}	0.053 (0.211)	0.044 (0.296)	-0.005 (0.903)	0.039 (0.358)	-0.012 (0.779)	-0.032 (0.450)	-0.003 (0.935)	1.000	-0.091** (0.031)	0.060 (0.155)	0.126*** (0.003)	0.121*** (0.004)	-0.081* (0.055)	0.061 (0.146)
MtoB _{j,t}	-0.263*** (0.000)	-0.240*** (0.000)	0.071* (0.092)	0.218*** (0.000)	0.108** (0.011)	-0.014 (0.733)	0.280*** (0.000)	-0.188*** (0.000)	1.000	0.035 (0.400)	-0.343*** (0.000)	-0.046 (0.280)	0.194*** (0.000)	-0.344*** (0.000)
SalesG _{j,t}	-0.149*** (0.000)	-0.130*** (0.002)	0.060 (0.156)	0.039 (0.353)	0.450*** (0.000)	-0.248*** (0.000)	0.106** (0.011)	0.054 (0.198)	0.172*** (0.000)	1.000	-0.075* (0.073)	0.110*** (0.009)	0.126*** (0.003)	-0.219*** (0.000)
Capital _{j,t}	0.203*** (0.000)	0.221*** (0.000)	-0.087** (0.038)	-0.203*** (0.000)	-0.017 (0.684)	0.067 (0.112)	-0.258*** (0.000)	0.195*** (0.000)	-0.692*** (0.000)	-0.148*** (0.000)	1.000	-0.062 (0.142)	-0.313*** (0.000)	0.251*** (0.000)
Leverage _{j,t}	0.230*** (0.000)	0.175*** (0.000)	0.035 (0.411)	-0.379*** (0.000)	0.057 (0.178)	-0.185*** (0.000)	-0.416*** (0.000)	0.263*** (0.000)	-0.133*** (0.002)	0.067 (0.114)	0.061 (0.144)	1.000	-0.144*** (0.001)	-0.405*** (0.000)

Table 4 Panel A: pearson and spearman correlations for the variables of opportunistic and efficient reporting behaviours (566 firm-year observations) (continued)														
	UE _{j,t}	InEx _{j,t}	Persis _{j,t}	Pred _{j,t}	Meet _{j,t}	Loss _{j,t}	SDE _{j,t}	NOA _{j,t}	MtoB _{j,t}	SalesG _{j,t}	Capital _{j,t}	Leverage _{j,t}	ROE _{j,t}	Size _{j,t}
ROE _{j,t}	0.052 (0.220)	0.029 (0.496)	0.145*** (0.001)	-0.139*** (0.001)	0.314*** (0.000)	-0.528*** (0.000)	-0.113** (0.007)	-0.095** (0.024)	0.385*** (0.000)	0.289*** (0.000)	-0.477*** (0.000)	0.097** (0.022)	1.000	0.102** (0.016)
Size _{j,t}	0.467*** (0.000)	0.319*** (0.000)	0.033 (0.429)	-0.401*** (0.000)	-0.045 (0.289)	-0.154*** (0.000)	-0.534*** (0.000)	0.050 (0.238)	-0.420*** (0.000)	-0.189*** (0.000)	0.347*** (0.000)	0.355*** (0.000)	-0.050 (0.239)	1.000

Table 4: Pearson and Spearman correlations for opportunistic and efficient hypotheses variables (continued)

Table 4 Panel B: pearson and spearman correlations for the variables of market reaction (218 firm-year observations)						
	Stock _{j,t}	AUEPS _{j,t}	EARPS _{j,t}	BVEPS _{j,t}	Mktcap _{j,t}	MtoB _{j,t}
Stock _{j,t}	1.000	0.673*** (0.000)	0.364*** (0.000)	0.338*** (0.000)	0.525*** (0.000)	0.385*** (0.000)
AUEPS _{j,t}	0.719*** (0.000)	1.000	0.345*** (0.000)	0.274*** (0.000)	0.304*** (0.000)	0.059 (0.383)
EARPS _{j,t}	0.293*** (0.000)	0.409*** (0.000)	1.000	0.285*** (0.000)	0.200*** (0.003)	0.117* (0.082)
BVEPS _{j,t}	0.462*** (0.000)	0.484*** (0.000)	0.354*** (0.000)	1.000	0.174** (0.010)	-0.016 (0.810)
Mktcap _{j,t}	0.509*** (0.000)	0.395*** (0.000)	0.226*** (0.001)	0.352*** (0.000)	1.000	0.063 (0.350)
MtoB _{j,t}	0.526*** (0.000)	0.235*** (0.001)	0.071 (0.297)	-0.047 (0.493)	0.239*** (0.000)	1.000

p statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Pearson (spearman) correlations are presented above (below)

Note: AUEPS_{j,t} is measured by the actual underlying earnings figure divided by the number of outstanding shares for firm *j*, in year *t*. EARPS_{j,t} is measured by statutory earnings that compare to underlying earnings (e.g., if firms reported underlying earnings before interest and tax, then the statutory earnings before interest and tax is selected for comparison) divided by the number of outstanding shares for firm *j*, in year *t*.

2.5.4 Regression results

2.5.4.1 Results for efficient reporting (H1)

Table 5 presents the year industry fixed-effects logit regressions results for H1. Model 1 presents the results for the association of earnings persistence with underlying earnings disclosure, while model 2 presents the results for the relationship between earnings predictability and underlying earnings disclosure. These results show that none of $Persis_{j,t}$ and $Pred_{j,t}$ are statistically related to $UE_{j,t}$, indicating that managers disclose underlying earnings not because the lack of persistence and predictability of statutory earnings to reflect ‘core’ earnings; indeed these results reject the efficient reporting hypothesis. For control variables, the $Size_{j,t}$ and $ROE_{j,t}$ are significantly positively associated with $UE_{j,t}$ under both models, which suggests that large firms and firms with high profitability are more likely to disclose underlying earnings. The rate of sales growth ($SalesG_{j,t}$) and market-to-book ratio ($MtoB_{j,t}$) are negatively significantly related to $UE_{j,t}$ under both models, which indicates that slow growing firms are more likely to disclose underlying earnings. The $SDE_{j,t}$ is significantly negatively related to $UE_{j,t}$ (coefficient=-3.374, p-value=0.004) under model 1 and (coefficient=-4.605, p-value=0.003) under model 2, which suggests that firms with high earnings variability are less likely to disclose underlying earnings. Collectively, the results of table 5 reject efficient reporting behaviour where firms disclose underlying earnings because they have less persistence statutory earnings, low predictability statutory earnings, and high variability statutory earnings.

Table 5: Regression results for efficient reporting (H1)

Model 1 with UE _{j,t} as dependent variable and Persis _{j,t} as independent variable					Model 2 with UE _{j,t} as dependent variable and Pred _{j,t} as independent variable			
	Coef.	Std. Err. ¹⁴	z	P>z	Coef.	Std. Err.	z	P>z
Persis _{j,t}	0.047	0.170	0.280	0.780				
Pred _{j,t}					1.250	1.035	1.210	0.227
Capital _{j,t}	0.062	0.163	0.380	0.705	0.068	0.161	0.420	0.673
Size _{j,t}	0.508***	0.084	6.050	0.000	0.499***	0.084	5.960	0.000
Leverage _{j,t}	0.694	0.440	1.580	0.115	0.644	0.431	1.490	0.135
SalesG _{j,t}	-0.902*	0.461	-1.960	0.051	-0.947**	0.459	-2.060	0.039
MtoB _{j,t}	-0.310*	0.177	-1.750	0.080	-0.317*	0.176	-1.800	0.072
ROE _{j,t}	1.606**	0.797	2.020	0.044	1.545*	0.796	1.940	0.052
SDE _{j,t}	-3.374***	1.164	-2.900	0.004	-4.605***	1.550	-2.970	0.003
NOA _{j,t}	0.264	0.199	1.330	0.183	0.241	0.197	1.220	0.222
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	-3.847***	0.997	-3.860	0.000	-3.727***	0.990	-3.760	0.000
Number of obs. ¹⁵	566				566			
Pseudo R2	24.02%				24.19%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2.5.4.2 Results for opportunistic reporting (H2, H3a & H3b)

2.5.4.2.1 Results for persistence of adjustments (H2)

Table 6 provides the year industry fixed-effects panel regressions results for the persistence of income-increasing underlying earnings exclusions. Panel A shows the results for the

¹⁴ Standard errors

¹⁵ Number of observations

persistence of income-increasing adjustments using $\text{InEx}_{j,t}$ as an independent variable, while panel B shows the results for the persistence of income-increasing adjustments using eight individual adjustments as the independent variables. Panel A shows that $\text{InEx}_{j,t}$ is significantly negatively related to $\text{OE}_{j,t+1}$ (coefficient=-0.146, p-value=0.063) and $\text{OE}_{j,t+1\text{to}2}$ (coefficient=-0.269, p-value=0.063), which indicates that those income-increasing underlying earnings exclusions are value-relevant to future earnings, and firms opportunistically exclude recurring expenses from statutory earnings to make underlying earnings look better than statutory earnings. That means one dollar of income-increasing exclusions implies one year ahead operating expenses of \$0.146 and one dollar of income-increasing exclusions implies future operating expenses over the subsequent two years of \$0.269. Following Frankel et al. (2011) and Dolye et al. (2003)' studies, this paper includes $\text{AUEPS}_{j,t}$, which is the actual underlying earnings for firm j, in year t, scaled by outstanding shares at the beginning of year t in panel B models. The results of panel B shows that the $\text{AUEPS}_{j,t}$ is significantly positively related to $\text{OE}_{j,t+1}$ (coefficient=0.046, p-value=0.000) and $\text{OE}_{j,t+2}$ (coefficient=0.097, p-value=0.000) which consistent with the Frankel et al. (2011) and Doyle et al. (2003)' results. For the eight individuals adjustments, only the $\text{Other}_{j,t}$ is significantly and negatively associated with $\text{OE}_{j,t+1}$ and $\text{OE}_{j,t+2}$ (coefficient=-0.038, p-value=0.035) and (coefficient=-0.111, p-value=0.003) respectively. That means one dollar of expense in 'other' category implies one year ahead operating expenses \$0.038 and one dollar of expense in 'other' category implies future operating expenses over the subsequent two years of \$0.111. These results indicate that managers opportunistically exclude recurring expenses from statutory earnings to make underlying earnings greater than statutory earnings and categorise them as 'Other', which is less likely to be detected by externals. Collectively, the results of table 6 suggest that managers opportunistically exclude recurring expenses from statutory earnings and define them as 'Other' to make underlying earnings appear more profitable than statutory

earnings. These income-increasing exclusions reflect inappropriate classification of earnings component by managers. For control variables, this paper finds firms with persistent statutory earnings have a high leverage ratio because $\text{Leverage}_{j,t}$ presents the significantly and positively association with $\text{OE}_{j,t+1}$ and $\text{OE}_{j,t+1\text{to}2}$ in the results of both panel A and panel B. A possible explanation may be because firms with high leverage ratios face a high risk if they violate debt covenants, so managers have high incentives to report high operating earnings and make them persist in order to avoid violating debt covenants. Moreover, table 6 finds that $\text{Size}_{j,t}$ is negative and significantly associated with $\text{OE}_{j,t+1}$ and $\text{OE}_{j,t+1\text{to}2}$ under both panel A and panel B, which indicates that large firms have less persistent operating earnings, possibly because they find transforming future earnings into realised earnings more difficult, since the monitoring function is inherently more difficult and expensive in larger firms (Jensen & Meckling, 1976; Watt & Zimmerman, 1986). This paper presents different results for the relationship between $\text{SDE}_{j,t}$ and future operating earnings in the panel A models and panel B model 5. These differing results may be due to different sample observations. Panel A uses the full sample so the negative relationship found would suggest that high earnings volatility generally impairs earnings persistence. In panel B, it only includes the income-increasing underlying earnings exclusions firm-year observations as the sample. The positive relationship between $\text{SDE}_{j,t}$ and $\text{OE}_{j,t+1}$ found in panel B suggests that where firm-year observations use income-increasing underlying earnings exclusions as earnings management, the variability of statutory earnings will persist in the one year ahead operating earnings.

Table 6: Regression results for persistence of adjustments (H2)

Table 6 Panel A: the regression results for H2 with $\ln Ex_{j,t}$ as an independent variable								
	Model 3 with $OE_{j,t+1}$ as dependent variable				Model 4 with $OE_{j,t+1to2}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$\ln Ex_{j,t}$	-0.146*	0.079	-1.860	0.063	-0.269*	0.145	-1.860	0.063
$MtoB_{j,t}$	-0.007	0.011	-0.700	0.483	-0.033*	0.019	-1.690	0.092
$ROE_{j,t}$	0.576***	0.125	4.600	0.000	1.215***	0.230	5.290	0.000
$Size_{j,t}$	-0.074***	0.024	-3.110	0.002	-0.156***	0.044	-3.570	0.000
$Leverage_{j,t}$	0.548***	0.131	4.190	0.000	1.080***	0.240	4.510	0.000
$SalesG_{j,t}$	0.006	0.138	0.040	0.967	-0.165	0.254	-0.650	0.517
$Capital_{j,t}$	0.121***	0.045	2.690	0.007	0.242***	0.083	2.920	0.004
$SDE_{j,t}$	-1.635***	0.150	-10.910	0.000	-2.244***	0.275	-8.150	0.000
$NOA_{j,t}$	0.051	0.054	0.940	0.348	0.119	0.099	1.200	0.229
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	0.100	0.258	0.390	0.698	0.293	0.474	0.620	0.536
Number of obs.	566				563 ¹⁶			
R-squared	25.01%				19.58%			

Table 6 Panel B: the regression results for H2 with eight individual adjustments as the independent variables								
	Model 5 with $OE_{j,t+1}$ as dependent variable				Model 6 with $OE_{j,t+1to2}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$AUEPS_{j,t}$	0.046***	0.006	7.140	0.000	0.097***	0.013	7.260	0.000
$IR_{j,t}$	0.011	0.014	0.780	0.436	0.032	0.030	1.070	0.285
$GLA_{j,t}$	-0.004	0.015	-0.260	0.796	-0.024	0.032	-0.740	0.459
$RC_{j,t}$	0.015	0.014	1.130	0.259	0.021	0.028	0.760	0.449
$MAC_{j,t}$	0.010	0.015	0.680	0.495	0.025	0.031	0.800	0.423
$TI_{j,t}$	-0.011	0.015	-0.740	0.461	-0.024	0.030	-0.800	0.423
$FGL_{j,t}$	0.007	0.018	0.380	0.706	0.021	0.038	0.570	0.569
$Other_{j,t}$	-0.038**	0.018	-2.120	0.035	-0.111***	0.037	-2.990	0.003
$Equity_{j,t}$	0.011	0.016	0.650	0.513	0.018	0.034	0.530	0.596
$MtoB_{j,t}$	0.003*	0.002	1.870	0.063	0.008**	0.004	2.070	0.040
$ROE_{j,t}$	-0.022	0.021	-1.040	0.301	-0.050	0.044	-1.150	0.251
$Size_{j,t}$	-0.039***	0.005	-7.440	0.000	-0.092***	0.011	-8.360	0.000
$Leverage_{j,t}$	0.166***	0.018	9.500	0.000	0.316***	0.036	8.690	0.000
$SalesG_{j,t}$	0.068***	0.024	2.830	0.005	0.119**	0.050	2.370	0.019
$Capital_{j,t}$	-0.011	0.008	-1.380	0.169	-0.023	0.016	-1.400	0.163
$SDE_{j,t}$	0.209***	0.075	2.780	0.006	0.173	0.156	1.110	0.268
$NOA_{j,t}$	-0.001	0.007	-0.170	0.865	-0.003	0.014	-0.190	0.850
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	0.395***	0.050	7.850	0.000	0.955***	0.104	9.150	0.000
Number of obs.	204				204			
R-squared	68.17%				68.40%			

¹⁶ David Jones Limited was delisted on 05/08/2014, Twenty-First Century Fox, Inc. was delisted on 09/05/2014, and Aquila Resources Limited was delisted on 30/07/2014.

Table 6: Regression results for persistence of adjustments (H2) (continued)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: $IR_{j,t}$ is dummy variable coded one if managers exclude impairment or revaluation of assets for firm j , in year t , and zero otherwise. $GLA_{j,t}$ is dummy variable coded one if managers exclude losses on asset dispositions or investments for firm j , in year t , and zero otherwise. $MAC_{j,t}$ is dummy variable coded one if managers exclude losses on merge or demerge and acquisition transaction costs for firm j , in year t , and zero otherwise. $TI_{j,t}$ is dummy variable coded one if managers exclude tax or interest-related expenses for firm j , in year t , and zero otherwise. $FGL_{j,t}$ is dummy variable coded one if managers exclude foreign exchange loss for firm j , in year t , and zero otherwise. $Equity_{j,t}$ is dummy variable coded one if managers exclude equity accounting for firm j , in year t , and zero otherwise. $Other_{j,t}$ is dummy variable coded one if managers exclude other items not classified in specific categories for firm j , in year t , and zero otherwise. $AUEPS_{j,t}$ is measured by the actual underlying earnings figure divided by the number of outstanding shares for firm j , in year t .

2.5.4.2.2 Results for opportunistic reporting (H3a & H3b)

Table 7 shows the regression results for H3a and H3b analysed using year industry fixed-effects logit regression models. Model 7 shows the results for H3a. The result of model 7 finds that $Meet_{j,t}$ is significantly and negatively related to $InEx_{j,t}$ (coefficient=-0.441, p-value=0.054), which suggests that when firms do not meet their earnings target, managers are more likely to use income-increasing underlying earnings exclusions opportunistically to report underlying earnings as being higher than the current statutory earnings, which confirms H3a. Model 8 shows the result for H3b where $Loss_{j,t}$ is significantly and positively associated with $InEx_{j,t}$ (coefficient=1.740, p-value=0.000), which indicates that when firms make current statutory earnings losses, they are more likely to apply positive exclusion opportunistically to define underlying earnings as being higher than statutory earnings, which confirms H3b. To conclude, table 7 confirms the opportunistic reporting behaviour where firms that do not meet earnings target or make current statutory losses are more likely to use income-increasing underlying exclusions opportunistically to define underlying earnings more favourable than statutory earnings.

For control variables, the $SDE_{j,t}$ is significantly and negatively related to $InEx_{j,t}$ for both models, indicating that firms with less volatility statutory earnings are more likely to disclose

underlying earnings as greater than statutory earnings, thus rejecting management assertions that they report underlying earnings because statutory earnings have high levels of volatility. The $MtoB_{j,t}$ is significantly and negatively associated with $InEx_{j,t}$ for both models, which suggests that low growth firms are more likely to use positive exclusions earnings management. The $ROE_{j,t}$ is positively and significantly related to $InEx_{j,t}$ indicating that firms with high profitability are more likely to define underlying earnings opportunistically. Large firms are more likely exclude income-increasing exclusions opportunistically because the evidence showing $Size_{j,t}$ is significantly and positively associated with $InEx_{j,t}$ in both models. $Capital_{j,t}$ is significantly and positively related to $InEx_{j,t}$ indicating that firms with more intensive capital are more likely to use positive exclusions earnings management.

Table 7: Regression results for opportunistic reporting (H3a & H3b)

	Model 7 with $InEx_{j,t}$ as dependent variables and $Meet_{j,t}$ as independent variable				Model 8 with $InEx_{j,t}$ as dependent variables and $Loss_{j,t}$ as independent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
$Meet_{j,t}$	-0.441*	0.229	-1.930	0.054				
$Loss_{j,t}$					1.740***	0.333	5.230	0.000
$Capital_{j,t}$	0.555***	0.168	3.310	0.001	0.615***	0.174	3.530	0.000
$Size_{j,t}$	0.234***	0.076	3.070	0.002	0.265***	0.077	3.420	0.001
$Leverage_{j,t}$	0.949**	0.440	2.160	0.031	1.041**	0.442	2.360	0.018
$SalesG_{j,t}$	-0.758	0.482	-1.570	0.116	-0.735	0.471	-1.560	0.118
$MtoB_{j,t}$	-0.283*	0.168	-1.680	0.093	-0.320*	0.173	-1.850	0.064
$ROE_{j,t}$	2.954***	0.939	3.140	0.002	4.279***	1.010	4.240	0.000
$SDE_{j,t}$	-3.663***	1.233	-2.970	0.003	-4.614***	1.315	-3.510	0.000
$NOA_{j,t}$	0.224	0.181	1.240	0.216	0.215	0.177	1.210	0.225
_cons	-4.758***	1.023	-4.650	0.000	-5.898***	1.076	-5.480	0.000
Number of obs.	566				566			
Pseudo R-squared	18.46%				22.24%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

2.5.4.3 Results for market reactions (H4)

Table 8 provides the results of year industry fixed-effects panel regressions for market reactions (H4). To test H4, this paper only investigates observations that reported underlying earnings. Model 9 presents the market reactions for sample observations that reported the actual value of underlying earnings. Model 9 shows that the $AUEPS_{j,t}$ other than $EARPS_{j,t}$ is

significantly and positively related to $Stock_{j,t}$ (coefficient=0.422, p-value=0.000), which indicates that when investors are presented by underlying earnings and statutory earnings, they perceive underlying earnings as value-relevant rather than statutory earnings. Model 10 presents the result of market reactions for sample observations that reported the actual value of underlying earnings as greater than the reported statutory earnings. Model 10 finds the same results as model 9 where underlying earnings ($AUEPS_{j,t}$) rather than statutory earnings ($EARPS_{j,t}$) are significantly and positively associated with the stock price ($Stock_{j,t}$) (coefficient=0.447, p-value=0.000). Table 8 indicates that when firms report underlying earnings or report underlying earnings that are greater than statutory earnings, investors perceive statutory earnings are value-irrelevant, react favourable to those underlying earnings figures, and believe that underlying earnings have more incremental value-relevant information than statutory earnings. Those underlying earnings which are greater than statutory earnings are priced higher than all actual underlying earnings by investors because the evidence shows a higher value of coefficient.

Table 8: Regression results for market reactions (H4)

	Model 9 with $Stock_{j,t}$ as dependent variable				Model 10 with $Stock_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$EARPS_{j,t}$	0.056	0.038	1.460	0.145	0.042	0.045	0.930	0.354
$AUEPS_{j,t}$	0.422***	0.035	12.030	0.000	0.447***	0.039	11.500	0.000
$BVEPS_{j,t}$	0.185***	0.041	4.490	0.000	0.158***	0.049	3.260	0.001
$Mktcap_{j,t}$	1.796***	0.238	7.530	0.000	1.427***	0.290	4.920	0.000
$MtoB_{j,t}$	0.334***	0.042	7.980	0.000	0.356***	0.050	7.150	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	-1.860***	0.497	-3.740	0.000	-5.649***	0.602	-9.380	0.000
Number of obs.	319				218			
R-squared	70.05%				68.00%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In sum, this paper confirms the opportunistic underlying earnings reporting hypothesis where managers opportunistically exclude recurring expenses from statutory earnings to make underlying earnings more profitable than statutory earnings and categorise these recurring expenses as ‘Other’ unspecific items because they are difficult for investors to detect. Managers do this to influence investors’ perceptions of firms’ performance when they do not meet statutory earnings target or make current statutory earnings losses, so they are more likely to exclude those opportunistic positive exclusions to make firms’ performance look better. Investors, however, are often misled by manager’s opportunistic reporting behaviour because they perceive underlying earnings are more value-relevant than statutory earnings.

2.6 Additional tests

Although the fixed-effects models are the preferred regression models for panel data, any errors may present problems with heteroskedasticity and autocorrelation. Heteroskedasticity means ‘that the error terms of the model are mutually uncorrelated, while the variance of error terms may vary over the observations’ (Verbeek, 2004, p.82), while autocorrelation occurs when the error terms are correlated over time, but it only occurs when using time series data. Although tests of serial correlation are applied to macro panels with long time series (over 20-30 years), they are not a problem in micro panels (within very few years) because serial correlation makes the standard errors of coefficients smaller than they actually are, and higher R squares (Pindyck & Rubinfeld, 1998). Heteroskedasticity and autocorrelation results in fixed-effects models becoming inefficient and their standard errors are estimated the wrong way. Since the results of table 6 panel B and table 8 have a relatively high R squares, and this paper has confirmed that multicollinearity is not a problem, it would have been caused by heteroskedasticity and autocorrelation problems. Therefore this study

conducted a Newey-West test to control any potential heteroskedasticity and autocorrelation problems.

The Newey-West test adjusts the standard errors of variables to heteroskedasticity-and-autocorrelation-consistent standard errors (Verbeek, 2004, p.110), developed by Newey & West (1987). In the Newey-West model, the correction multiplies the traditional standard error by \sqrt{NW} , where $NW = 1 + \sum_{i=1}^n (1 - \frac{i}{n}) \rho_i$. The variable ρ_i is the autocorrelation at lag i and n is the number of lags expected to be auto-correlated (Doyle et al., 2003).

This paper tests H2 and H4 again using the Newey-West test; the results for H2 are shown in table 9. As with the main results in H2, table 9 finds that recurring expenses are realised in future earnings representing managers' opportunistic reporting behavior. The result for the Newey-West test of H4 is shown in table 10 and finds evidence confirming the main result of H4 where investors perceive that underlying earnings are more value-relevant than statutory earnings for the sample of observations that reported underlying earnings and observations that reported underlying earnings as being higher than statutory earnings.

Table 9: Newey-West test for persistence of adjustments (H2)Table 9 Panel A: the regression results for H2 with $\ln Ex_{j,t}$ as an independent variable

Model 11 with $OE_{j,t+1}$ as dependent variable					Model 12 with $OE_{j,t+1to2}$ as dependent variable			
	Coef.	Newey-West Std. Err.	t	P>t	Coef.	Newey-West Std. Err.	t	P>t
$\ln Ex_{j,t}$	-0.146*	0.087	-1.680	0.093	-0.269*	0.158	-1.700	0.089
$MtoB_{j,t}$	-0.007	0.014	-0.530	0.594	-0.033	0.037	-0.890	0.373
$ROE_{j,t}$	0.576*	0.324	1.780	0.076	1.215*	0.735	1.650	0.099
$Size_{j,t}$	-0.074	0.051	-1.430	0.152	-0.156	0.111	-1.410	0.159
$Leverage_{j,t}$	0.548*	0.280	1.960	0.051	1.080**	0.506	2.140	0.033
$SalesG_{j,t}$	0.006	0.185	0.030	0.975	-0.165	0.333	-0.490	0.621
$Capital_{j,t}$	0.121	0.082	1.480	0.141	0.242	0.160	1.510	0.132
$SDE_{j,t}$	-1.635	1.239	-1.320	0.188	-2.244	1.607	-1.400	0.163
$NOA_{j,t}$	0.051	0.052	0.980	0.327	0.119	0.102	1.170	0.244
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	0.100	0.335	0.300	0.766	0.293	0.684	0.430	0.668
Number of obs.	566				563			
$F(19, 546)$	1.83			$F(19, 543)$	2.04			
Prob > F	0.0173				0.0059			

Table 9 Panel B: the regression results for H2 with eight individual adjustments as the independent variables

Model 13 $OE_{j,t+1}$ as dependent variable					Model 14 $OE_{j,t+1to2}$ as dependent variable				
	Coef.	Newey-West Std. Err.	t	P>t	Coef.	Newey-West Std. Err.	t	P>t	
$AUEPS_{j,t}$	0.046***	0.011	4.010	0.000	0.097***	0.021	4.730	0.000	
$IR_{j,t}$	0.011	0.019	0.590	0.554	0.032	0.040	0.800	0.422	
$GLA_{j,t}$	-0.004	0.013	-0.300	0.765	-0.024	0.028	-0.850	0.398	
$RC_{j,t}$	0.015	0.013	1.230	0.222	0.021	0.026	0.830	0.409	
$MAC_{j,t}$	0.010	0.011	0.930	0.354	0.025	0.023	1.090	0.277	
$TI_{j,t}$	-0.011	0.012	-0.890	0.373	-0.024	0.025	-0.960	0.337	
$FGL_{j,t}$	0.007	0.023	0.300	0.763	0.021	0.044	0.480	0.629	
$Other_{j,t}$	-0.038*	0.020	-1.880	0.061	-0.111***	0.040	-2.750	0.007	
$Equity_{j,t}$	0.011	0.017	0.640	0.526	0.018	0.035	0.520	0.602	
$MtoB_{j,t}$	0.003**	0.002	2.280	0.024	0.008**	0.003	2.560	0.011	
$ROE_{j,t}$	-0.022	0.028	-0.770	0.441	-0.050	0.057	-0.880	0.382	
$Size_{j,t}$	-0.039***	0.006	-6.120	0.000	-0.092***	0.015	-6.290	0.000	
$Leverage_{j,t}$	0.166***	0.021	7.840	0.000	0.316***	0.034	9.310	0.000	
$SalesG_{j,t}$	0.068***	0.020	3.450	0.001	0.119***	0.040	2.960	0.003	
$Capital_{j,t}$	-0.011	0.012	-0.900	0.369	-0.023	0.026	-0.880	0.379	
$SDE_{j,t}$	0.209	0.178	1.180	0.241	0.173	0.268	0.650	0.518	
$NOA_{j,t}$	-0.001	0.003	-0.340	0.731	-0.003	0.007	-0.400	0.690	
Year effects	YES				YES				
Industry effects	YES				YES				

Table 9 Panel B: the regression results for H2 with eight individual adjustments as independent variables (continued)

	Model 13 $OE_{j,t+1}$ as dependent variable					Model 14 $OE_{j,t+1to2}$ as dependent variable				
	Coef.	Newey- West Err.	Std.	t	P>t	Coef.	Newey- West Err.	Std.	t	P>t
_cons	0.395***	0.074		5.310	0.000	0.955***	0.177		5.410	0.000
Number of obs.	204					204				
F(27, 176)	12.28					19.17				
Prob > F	0.000					0.000				

Table 10: Newey-West test for market reactions (H4)

	Model 15 with $Stock_{j,t}$ as dependent variable				Model 16 with $Stock_{j,t}$ as dependent variable			
	Coef.	Newey-West Std. Err.	t	P>t	Coef.	Newey-West Std. Err.	t	P>t
EARPS _{j,t}	0.056	0.046	1.200	0.229	0.042	0.047	0.890	0.377
AUEPS _{j,t}	0.422***	0.063	6.740	0.000	0.447***	0.073	6.140	0.000
BVEPS _{j,t}	0.185***	0.054	3.440	0.001	0.158***	0.053	2.980	0.003
Mktcap _{j,t}	1.796***	0.328	5.480	0.000	1.427***	0.355	4.010	0.000
MtoB _{j,t}	0.334***	0.068	4.920	0.000	0.356***	0.076	4.680	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
_cons	-1.860***	0.693	-2.690	0.008	-5.649***	0.737	-7.670	0.000
Number of obs.	319					218		
F(14, 303)	32.280				F(14, 203)	20.180		
Prob > F	0.000					0.000		

2.7 Summary of chapter two

This paper investigates managers' underlying earnings reporting behaviour based on signalling theory, prospect theory, and agency theory where, along with signalling theory conjecture, it examines whether managers disclose underlying earnings efficiently to signal the underlying economic value of firms to help investors evaluate firms' ongoing economic performance better when statutory earnings cannot. Moreover, based on prospect theory combined with agency theory assumptions, this paper investigates whether managers disclose underlying earnings higher than statutory earnings opportunistically to make firms'

performance more prospective when they do not meet earnings targets or make current statutory losses. Finally, this paper examines how the market reacts to this underlying earnings reporting. The results confirm opportunistic reporting behaviour that when firms do not meet statutory earnings target or make statutory losses, they are more likely to opportunistically use income-increasing underlying exclusions to make them look better than statutory earnings to influence investors' perceptions of firm performance. Specifically, managers exclude recurring expenses from statutory earnings to define underlying earnings and categorise those expenses as 'Other' unspecific items. Investors, however, are often misled by this opportunistic reporting behaviour and react positively to such underlying earnings.

CHAPTER THREE Equity overvaluation and managers' choices of using alternative earnings management mechanisms

This paper is in preparation for publication. I, Yiru Yang, declare that this paper is wholly my own work unless otherwise referenced or acknowledged.

Yiru Yang

21 June 2016

3.1 Introduction

Since earnings and earnings growth are key components in determining firm value, managers are highly motivated to manage earnings that ultimately inflate firm value and artificially increase earnings and earnings growth expectations to increase the stock prices (Dechow et al., 2000; Badertscher, 2011; Adams et al., 2009; Graham et al., 2005; Brown & Caylor, 2005). Studies have found that manager's wealth increases as a firm's stock price increases because their compensation is associated with the stock price via stock performance-based incentives (Bergstresser & Philippon, 2006; Burns & Kedia, 2003). Moreover, job security and current value in the executive labour market of managers typically increases with the strong performance of stock because a manager is less likely to lose their job when stock is performing well (Weisbach, 1988). These motivations typically stimulate managers to strive for higher stock prices. Studies find that earnings management is the main approach used by managers to obtain their desired economic outcomes and they are fully aware of opportunities to manage earnings (Nelson et al., 2002; 2003; Badertscher, 2011). However, the aggregate value of investors destroyed by earnings management far exceeds that by high-profile fraud cases (Graham et al., 2005; Badertscher, 2011) because investors are unlikely to see through earnings management (Sloan, 1996; Xie, 2001).

Jensen (2005)'s agency theory of overvalued equity suggests that when a firm's stock price is becoming overvalued, these firms try to maintain their overvaluation by participating in a variety of earnings management choices. Prior researches have provided empirical evidence consistent with Jensen's (2005) conjecture. For instance, Efendi et al. (2007) demonstrated that restatement firms exhibit signs of being overvalued in the years prior to engaging in non-statutory earnings management, and provided evidence that stock compensation incentives push managers to sustain their overvalued stock prices. Badertscher (2011) presented evidence that overvaluation is an important determinant of managements' earnings

management decisions. The author has found that managers participate in accruals earnings management in the early stage of overvaluation, then move to real activities earnings management to sustain the overvaluation of the equity, and at a later stage of overvaluation, they engage in non-GAAP earnings management. Although several researches investigated the correlation between overvaluation of equity and earnings management, there is still limited empirical evidence regarding the correlation between the duration of overvaluation and management's choice of alternative earnings management mechanisms (Badertscher, 2011).

Chapter two (i.e., paper one) of this thesis found that underlying earnings is disclosed opportunistically by managers to influence investors' perceptions of firms' performance to increase the stock prices. This paper attempts to examine whether overvalued firms engage in earnings management and whether the duration of overvaluation influences manager's choice of using different earnings management mechanisms. First, this paper examines the relationship between overall overvalued equity and two types of earnings management (opportunistic underlying earnings reporting and accruals earnings management) separately to understand which earnings management technique is more likely to be used by overvalued firms during the sample years in general. Second, this paper attempts to investigate whether the duration of equity overvaluation affects management's choice of using accruals earnings management and opportunistic underlying earnings reporting. Third, as studies have found that balance sheet bloat limits managers' abilities to use accruals earnings management (Black et al., 2014; Badertscher, 2011; Zang, 2012), this paper attempts to understand whether overvalued firms with accruals earnings management constraints are only to disclose opportunistic underlying earnings to maintain overvaluation.

The results provide evidence that overvalued firms are more likely to engage in opportunistic underlying earnings reporting rather than accruals earnings management during the sample years in general. More precisely, overvalued firms not only disclose underlying earnings, they are more likely to use opportunistic income-increasing underlying exclusions to make underlying earnings greater than statutory earnings. When examining how the duration of equity overvaluation affects management's choice of using earnings management mechanisms, this study finds that at the early stage of overvaluation, managers are more likely to use accruals earnings management and income-increasing accruals earnings management. At a later stage of overvaluation, they then run out of accruals earnings management choices, resort to underlying earnings disclosures and disclose them opportunistically in order to maintain overvaluation. Lastly, this study finds that it is difficult for overvalued firms with high balance sheet bloat to apply either accruals earnings management or income-increasing accruals earnings management because they have a limited ability to use them, so they tend to opportunistically disclose underlying earnings to maintain overvaluation.

Section 3.2 provides the literature reviews of this paper. Section 3.3 explains the theoretical framework and development of hypotheses. Section 3.4 describes the research design of this paper. Section 3.5 presents the descriptive statistics, pearson and spearman correlations, and regressions results. Section 3.6 provides the additional tests of this study, and section 3.7 gives the conclusion.

3.2 Literature review

3.2.1 The definition of earnings management

The definition of earnings management is mixed in literature; some parties perceiving earnings management to be desirable, while others define earnings management as opportunistic (Subramanyam, 1996).

Scholars perceive earnings management to be desirable when managers signal private information, that is, they signal their superior forecasting ability on future cash flows using the flexibility contained in the choice of accounting (Demski, 1998; Francis et al., 2008b; Ronen & Yaari, 2008).

Researchers define earnings management as opportunistic when reported earnings are manipulated via biased accrual decisions, structuring of transactions, or misclassifying the accounts by managers to maximise their self-interest, and have the potential to mislead some stakeholders regarding the potential underlying economic performance of a firm or to affect contractual outcomes (e.g., Akers et al., 2007; Healy & Wahlen, 1999). Studies found that earnings management directly influences the overall integrity of financial reporting and have significantly adverse impact on the allocation of resources throughout firms (Dechow et al. 1995; Healy & Wahlen, 1999; Beneish & Vargus, 2002; Schipper & Vincent, 2003).

Extant literature has found three types of opportunistic earnings management mechanisms; real activities earnings management, accruals earnings management, and non-statutory earnings management. These three earnings management mechanisms are discussed as described below:

Real activities earnings management

Real activities earnings management is defined as management actions that deviate from normal business practices, stimulated by their intention to misguide at least some stakeholders to believe that certain financial reporting objectives have been met in the normal course of operations (Roychowdhury, 2006). The earnings management of actual activities is designed to alter reported earnings in a specific direction, by transforming the timing or structuring of an investment, operating or financing a transaction, and which has suboptimal business consequences. For example, managers could decrease R&D, advertisement, and maintenance expenditures to inflate earnings (Badertscher, 2011; Roychowdhury, 2006).

Accruals earnings management

Accruals refer to the gap between cash flow and earnings that arise from differences between the timing of the accounting recognition and that of cash flows. Accruals require assumptions, management judgments, and estimates about the future realisation of earnings into cash flows which might be affected by biases during estimation, or estimators' judgments that lead to misrepresentation of financial phenomena to distort a firms' true economic value (Mohammady, 2010; Sloan, 1996; Healy & Wahlen, 1999; Schipper & Vincent, 2003).

Accruals earnings management means the purposeful transferring of accruals in a particular direction to manage earnings by changing the methods of accounting or estimates when showing a given transaction in financial statements (Badertscher, 2011; Zang, 2012). For instance, changing the approach to depreciation for fixed assets and estimating for doubtful accounts can bias reported earnings in a particular direction without changing the underlying transactions.

Non-statutory earnings management

Non-statutory earnings management is reporting where managers deliberately misclassify items to mislead investors; as in when managers adjust revenue or expenses to alter financial reports (McVay et al., 2006). Prior researchers used restatements reported in SEC Filing Library, in Lexis-Nexis News Library, (e.g., Palmrose et al., 2004) and in the GAO Financial Statement Restatement Database (e.g., Desai et al., 2006) as a proxy for non-statutory earnings management. Studies found that restated earnings can change the market's decision about firm value (Palmrose et al., 2004; Lev et al., 2008), however, firms with restatements are associated with a very high turnover of managers (Hennes et al., 2008; Desai et al., 2006), a high turnover of directors (Srinivasan, 2005), high litigation risk (Palmrose & Scholz, 2004) and lawsuits (Lev et al., 2008). More recently, researchers have found that managers may use their discretion to define non-statutory earnings opportunistically to shift some actual recurring expenses to non-recurring exclusions, resulting in a firm with favourable non-statutory earnings (e.g., pro forma earnings) (e.g., Doyle et al., 2003; Bowen et al., 2005; Doyle et al., 2013; McVay et al., 2006). Comparing to real activities and accruals-based earnings, opportunistically defining the non-statutory earnings (shifting recurring expenses to non-recurring items to make non-statutory earnings higher than statutory earnings) are perceived as less detectable earnings management technique by managers, because non-statutory earnings are not audited. Moreover, unlike accruals earnings management and real activities earnings management, bottom-line net income is unaffected opportunistic non-statutory earnings disclosure is used (Fan et al., 2010). Studies have found that when firms have limited abilities to engage in accruals or/and real activities earnings management, they are more likely to disclose non-statutory earnings opportunistically (Black et al., 2014; Doyle et al. 2013; Elshafie et al. 2010). Opportunistic underlying earnings reporting was examined in paper one (i.e., chapter two), and is one example of non-statutory earnings management.

3.2.2 The motivations for opportunistic earnings management

Accounting literature, as summarised by Healy & Wahlen (1999) and Graham et al. (2005), has offered a number of motivations to explain why managers might exercise accounting discretion to achieve their desirable outcomes; they are categorised as: market valuation driven motivations, contracting motivations, regulatory motivations. This paper discusses these motivations as follows.

3.2.2.1 Market valuation driven motivations

Studies shows that markets are concerned about earnings benchmarks, so firms that fail to meet market expectations would experience large declines in stock prices on the date that earnings are announced (Skinner & Sloan, 2002). Pressures from the stock market induce managers to manipulate earnings to meet market expectations. The literature review regarding earnings management and meeting earnings benchmark has been discussed in section (2.3.4.3). The present evidence of survey complies with the importance of stock price incentives to meet or beat earnings benchmarks. Graham et al. (2005) have found that over 80% of CEOs consider that meeting benchmarks establishes their credibility with the capital market. They also believe that meeting benchmarks could deliver prospects of future growth to investors to sustain or enhance the stock price of the firm. Other studies of market valuation motivations on earnings management have examined the equity offering research area and found that firms are likely to manage earnings upward using income-increasing accruals to enhance short-term firm performance when approaching equity offers (e.g., Shivakumar, 2000; Teoh, 1998a; b). Adams et al. (2009) examined the relationship between earnings management and initial public offerings (IPO) for demutualising thrift in the depository sector, and unlike a typical IPO where insiders are 'net sellers' of IPO shares,

insiders are ‘net buyers’ of IPO shares in a demutualising thrift, so management has an incentive to minimise earnings downward so that insiders and directors could enhance their proportional ownership in the firm at the lowest price.

The most recent studies have found that overvaluation equity induces managers to use earnings management; a detailed explanation of this finding is discussed in the theoretical framework and development of hypotheses in section 3.3.3 of this chapter.

3.2.2.2 Contracting motivations

Accounting data have been utilised to help monitor and regulate contracts such as management compensation contracts and lending contracts between a firm and its stakeholders (Dechow, 2004; Healy & Wahlen, 1999; Schipper & Vincent, 2003). These contracts generate incentives for earnings management (Healy & Wahlen, 1999; Watts & Zimmerman 1986). The motivation for management compensation contracts and lending contracts are discussed below:

Management compensation contracts

Several papers argue that managers exercise accounting discretion to maximise the present value of their bonus compensation. Graham’s (2005) study presented survey evidence that CFOs consider compensation to be a key factor for implementing discretion in accounting, while other studies found that managers with high stock-based compensation tend to conduct earnings management using income-increasing discretionary accruals to achieve their bonus levels (e.g., Baker et al., 2009; Healy & Wahlen, 1999). Baker et al. (2009) examined optional grants and accruals earnings management around grant dates and found that managers utilise discretionary accruals to manage earnings to increase the value of stock

options. Achilles et al. (2013) applied a between-subjects design experimental study to examine how compensation and motivation affect earnings management behaviour at an individual level, and found that when compensation is associated with firm performance, managers make decisions to increase current earnings when current earnings are below analysts' forecasts. Brockman et al. (2010) examined voluntary disclosures around the exercise of Chief Executive Officer (CEO) stock options and found there was considerable growth in the magnitude and frequency of announcing good or bad news in the pre-exercise period when CEOs adopt the strategies of exercise-and-sell (exercise-and-hold). The authors concluded that management relies on the intended disposition of the exercised share options. When CEOs intend to sell shares of exercised options, they try to enhance stock prices in the pre-exercise period, but when they intend to hold the shares, they have a tax incentive to reduce stock prices in the pre-exercise period.

Lending contracts

Debt contract is an important theme in financial accounting study because lenders usually utilise accounting numbers to regulate firm activities by requiring that the objectives of a particular performance must be met or impose limits to allow for financing and investing activities. The assumption is that debt covenants motivate managers to increase earnings by either decreasing the restrictiveness of accounting-based constraints in debt agreements, or to prevent the cost of covenant violations (Graham, 2005).

Studies for opportunistic earnings management in literature on lending covenants found that firms close to their debt covenant are more likely to change accounting estimates using accruals to prevent the debt covenant from being violated. For example, DeFond & Jambalvo (1994) found that potential earnings management firms increased earnings one

year before the covenant was violated, which suggests that earnings management are made by firms who are close to their debt covenants. Franz et al. (2014) examined the influence of differential incentives from proximity to debt covenant violation on earnings management and found that firms close to violation or in technical default of their debt covenants tend to participate in higher levels of accruals earnings management, real activities earnings management, and total earnings management (i.e., sum of accruals earnings management and real activities earnings management) than firms that are far away from violation. The study also documented that the earnings management implications of debt covenant violation are observed primarily for firms nearer financial distress and firms that do not meet analyst forecasts. Graham et al. (2005) found that private firms are more likely to participate in earnings management to avoid violating a debt covenant. By examining a large sample of private debt covenants, Dichev & Skinner (2002) found a significantly larger proportion of firms that were slightly above the violation threshold of covenant than below, which implies that managers take actions that are consistent with avoiding covenant default.

The studies discussed above generally imply that lending contracts and management compensation contracts induce some managers to manage earnings so as to enhance the bonus levels and reduce the potential violation of contracts.

3.2.2.3 Regulatory considerations

Pressure from affiliated parties arising from either request or opinion, might entice managers to manage earnings (Chen & Tsai, 2010), and many studies found that regulations are associated with accounting choices. Tax regulations are commonly studied in earnings management literature (Dechow et al., 2010), and researchers found that firms using income-decreasing earnings management intend to avoid the cost of perceived excessive profitability

in response to changes in tax regulations (e.g., Lim & Matolcsy, 1999; Monem, 2003; Wilson & Shailer, 2007). For example, Wilson & Shailer (2007) investigated the earnings management behaviour of a large Australian brewing firm (Tooth & Co limited) between 1910 and 1965, and found that managers used abnormal income-decreasing accruals in response to changes in the rate of excise levied on beer production in the periods surrounding regulatory enquiries and public referenda, that threatened firm profitability. Another commonly studied regulation in earnings management literature is regulatory capital, known as capital requirements (Dechow et al., 2010). Many researchers have examined the capital requirements in the insurance and banking industries (e.g., Adiel, 1996; Beatty et al., 1995; Collins et al., 1995; Petroni, 1992), and found in the insurance industries for instance, that insurance firms attempt to understate reserves of claim loss and engage in transactions of reinsurance (e.g., Adiel, 1996; Petroni, 1992). Research into the banking industry found that when banks are close to holding the minimum requirements of capital they tend to overstate their loan loss provisions and understate their loan write-offs (e.g., Beatty et al., 1995; Collins et al., 1995).

Central to all these studies of earnings management is the presumption that managers, given their different incentives, use their reporting discretion opportunistically rather than to enhance the representative faithfulness and informativeness of their firm's financial statements.

3.2.3 Managers' decisions on using multiple earnings management mechanisms

A manager's decision to use different earnings management techniques has been examined in several studies. Graham et al. (2005) present evidence to show that managers prefer to apply real earnings management activities compared to accruals earnings management. They found

that 80% of surveyed CEOs reduced discretionary expense on research and development, and maintenance and advertisement to meet earnings targets, so the authors concluded that this is true because real management activities are less likely to be scrutinised by regulators and auditors, and the probability of not being detected is high even though the consequences of such activities could destroy the long-term economic performance of firms. The adverse impacts of real activities earnings management on long-term economic performance are supported by several studies. For example, Mizik (2010) compared the total financial consequences of real activities earnings management and accruals earnings management by utilising a sample of U.S. listed firms between 1986 and 2005, and found that real activities earnings management, not accruals earnings management, would have more adverse influences on future financial performance and have a long-term net negative impact on firm value. The author also found that the stock market cannot accurately value marketing and innovation activity when confronted with potential real activities management. Alhadab et al. (2015) examined whether managers participate in accruals and real activities earnings management around the IPO, and used a sample of 570 U.K. firms that went public from 1998 to 2008, to analyse the consequences of accruals and real activities earnings management on the probability of IPO failure and survivability in the following periods. Their results suggested that IPO firms in the U.K. did participate in actual earnings management or real activities earnings management in the year of IPO, and IPO firms with high levels of accrual or real activities earnings management during IPO year had more probability of IPO failure and lower survival rates in following periods, where real activities earnings management has more severe consequences. But the researches discussed above did not directly examine the relationship between accruals earnings management and real activities earnings management.

3.2.3.1 Substitution association

There are many examples in literature of managers using different earnings management techniques for their self-interest, mainly because the benefits and costs of each earnings management are different, so they trade off different earnings management based on the costs and benefits attached.

Cohen & Zarowin (2010) used U.S. data from 1987 to 2006 to examine managers' decisions on using real and accruals earnings management activities around seasoned equity offerings (SEOs) and the consequences of two earnings managements on firms' future operating performance, and found that managers apply real activities and accrual-based earnings management around SEOs such that their decisions on trading off real activities earnings management and accruals earnings management are based on the costs attached. When the cost of accruals earnings management is high (e.g., high scrutiny from outsiders and high litigation risk), managers tend to utilise real earnings management. Studies also find that the reduction in post-SEOs performance due to the influence of real activities management on firms' future operating performance is more severe than from accruals management. Zang (2012) used a large sample of U.S. firms from 1987 to 2008 to investigate how managers make decisions on trading off real activities earnings management and accruals earnings management in managing earnings, and found they used two earnings management strategies alternatively, based on their relative costs, and then adjusted the level of accruals earnings management according to the level of real activities earnings management realised. If firms operate in an environment where manipulating real activities is costly due to their less than healthy financial condition, less competitive status in the industry, higher marginal tax rates, and a higher level of scrutiny from institutional investors, then managers tend to utilise accruals earnings management more and real activities earnings management less. If firms'

accounting practice is constrained because of heightened regulatory scrutiny, previous periods of accruals earnings management, and flexible balance sheets, then the converse is true. The author concluded that the amount of accruals earnings management increases (decreases) when the outcome of real activities earnings management turns out to be too low (high), showing that managers substitute the two strategies directly. Cohen et al. (2008) examined the changes in accruals and real activities earnings management in the pre- and post- SOX periods, and also investigated whether firms make a substitution between real and accruals earnings management after SOX periods. They found that overall earnings management (i.e., sum of real activities earning management and accruals earnings management) increased over the time of the SOX passage, but afterwards the level of total earnings management returned to the pre-SOX trend line. Their study also found that when the level of accruals earnings management declined, the level of real activities earnings management grew dramatically after the passage of SOX, which implies that managers changed from utilising accruals earnings management to real activities earnings management after SOX. The authors concluded that the phenomenon that transformed away from accruals basis to real earnings management in the post-SOX period implied that in the post-SOX period following highly publicised scandals of accounting, the need to prevent accruals earnings management from being detected is greater than in previous periods, forcing managers to shift from accruals to real earnings management. Achleitner et al. (2014) investigated managers using real earnings management and accruals earnings management in German listed family firms from 1998 to 2008, and found that unlike non-family firms, family firms used more income-decreasing accruals earnings management practices, and were less engaged in real activities earnings management. The authors also found that family firms applied real activities earnings management and accruals earnings management substitute to help families retain prospective future economic performance. Badertscher

(2011) examined how the degree and duration of overvaluation influenced managements' decision to use three different earnings management techniques (accruals earnings management, real activities earnings management and non-statutory earnings management), and found that firms used these alternatively and concluded that overvaluation is an important determining factor in managements' earnings management decisions.

There are three papers in extant literature that investigated managers using accruals earnings management and non-statutory earnings disclosures. Elshafie et al. (2010) was the first study to examine the relationship between investor perception management by reporting opportunistic pro forma earnings (measured by the difference between GAAP EPS and Pro forma EPS) and earnings management through real activities or by accruals. They found that managers reported pro forma earnings opportunistically if they failed to meet their earnings targets or had limited abilities to manage earnings. They also found that the relevant value of pro forma earnings is always higher than statutory earnings regardless of whether firms are involved in high or low accruals earnings management. These results suggest that when managers do not meet earnings targets or have limited ability to manipulate within-statutory earnings, they are more likely to report aggressive pro forma earnings to influence the perception of investors. Doyle et al. (2013) investigated whether managers utilise pro forma earnings to meet earnings targets and whether opportunistic disclosure of pro forma earnings (measured by income-increasing exclusions) is a substitute for accruals and real activities earnings management. They presented evidence that managers use pro forma earnings management to meet earnings targets, and when managers have limited ability to use earnings management they are more likely to opportunistically define pro forma earnings. Investors, however, discount positive earnings surprises when accompanied by opportunistic pro forma disclosure, which suggests that the market partially understands the opportunistic nature of

income-increasing exclusions made by managers. Black et al. (2014) investigated the trade-off strategies of managers using different earnings managements and how the market reacts to them, and found that firms with less current accruals earnings management and less current real activities earnings management are more likely to disclose pro forma earnings and disclose pro forma earnings opportunistically. Similar to Doyle et al. (2013)' study, market reactions suggest that investors understand managers' trade-off strategies and react negatively on pro forma earnings. These three papers presented the evidence that managers apply accruals earnings management and non-statutory earnings management alternatively, however, none of them examined whether the equity overvaluation influences a manager's decision to use different earnings management mechanisms.

3.2.3.2 Complementary association

Other studies suggest that managers use earnings management mechanisms that are complementary. Indeed, researchers argue that the reporting environment is an important factor in the decision to use earnings management mechanisms, and found that managers are more likely to use different earnings management mechanisms in a complementary way in countries with a relatively low accounting disclosure environment and litigation costs.

Chen et al. (2012) examined whether real activities and accruals earnings management played mutually complementary roles in Taiwanese earnings reporting and found that real activities earnings management is positively associated with accruals earnings management. This result supports the fact that accruals and real activities earnings management play important roles in concurrently and strategically meeting or beating firm's earnings in a relatively low accounting disclosure environment and low litigation cost settings. Similarly, Sanjaya & Saragih (2012) examined the correlation between accruals earnings management and real

activities earnings management in the context of Indonesia, and found that real activities earnings management is significantly and positively related to accrual earnings management. This confirmed Chen et al.'s (2012) study that in a country with relatively low accounting disclosure environment and low litigation cost settings, managers use accruals and real activities earnings management to managing firm performance.

Literature indicates that managers use different earnings techniques either substitutionally or complementary, while literature containing managers' decisions to use multiple earnings management mechanisms is summarised in Appendix section 1.2.

3.3 Theoretical framework and development of hypotheses

3.3.1 Definition of agency theory of overvalued equity

Agency theory of overvalued equity was introduced by Jensen (2005), who defined equity as being overvalued when a firm's stock price is higher than its underlying value and company cannot, except by pure luck, deliver a performance that justifies its value. He proposed an agency theory of overvalued equity by conjecturing that when a firm's stock price becomes overvalued, the potential for conflicts of interest between owners and managers grows. Here, managers of overvalued firms not only refuse any market correction of overvalued stock prices, they actually tend to extend overvaluation by engaging in earnings management that increases reported earnings. Therefore, stock valuations that are too high induce managers to engage in earnings management in order to maintain this upward trend in earnings and stock prices (Jensen, 2005).

3.3.2 Key concepts of agency theory of overvalued equity

As the agency theory of overvalued equity originates from agency theory, so the key concepts of agency theory discussed in section 2.3.4 in chapter two hold true in the agency theory of overvalued equity. However, in the previous article on agency theory, and others since then (e.g, Jensen & Meckling, 1976), literature viewed markets as potent forces to help control agency costs, so the contribution made by the agency theory of overvalued equity is to describe how markets can sometimes create and exacerbate conflicts of interest between owners and managers rather than resolve them (Jensen, 2005). In Jensen's (2005) explanation of the agency theory of equity overvaluation, the agency costs of overvalued equity expanded the range of costly conflicts of interest that the traditional agency model can handle, particularly market and managerial optimism, and the forces that allow or even encourage markets to become enablers of managerial behaviour that destroys value. He asserts that to avoid disappointing investors, managers of firms with overvalued equity participate in various actions including making acquisitions, excessive internal expenses, earnings management, and even fraud to assure investor expectations of future growth. With these actions, managers can trick the market for some time via the delusion of growth, and the more overvalued the equity, the greater the incentive to maintain such an overvaluation because managers' wealth is connected with the firm's stock price (Marciukaityte & Varma, 2008; Coulton et al., 2014). In essence, management will create the value the market expects, and then fools it for some time by providing an illusion of growth. Jensen (2005) suggests that these actions reflect agency costs that arise from overvalued equity. Unlike the original agency theory that has some solutions to agency costs (e.g., bonding and monitoring costs), Jensen asserts there are no simple solutions to the agency costs of overvalued equity.

Overvalued firms can suffer negative consequences because their managers might be encouraged to act in ways that are detrimental to long-term value, so as a firm becomes more overvalued, the stress to meet earnings targets grows, and managers might strengthen market optimism by showing their firms as favourably as possible. Therefore, when share prices are too high, managers could resort to upward earnings management if they want to retain an excessive share price. However share prices can increase temporarily (Badertscher, 2011), so when participants in the market notice that a firm's lofty value is an illusion, there is a dramatic decline in firm value due to a correction of earlier overvaluation and a subsequent loss of confidence in the trustworthiness of the firm's managers (Marciukaityte & Varma, 2008).

3.3.3 Application of agency theory of overvaluation in literature

There are a number of studies that directly test Jensen's overvaluation hypothesis; for instance, Houmes & Skantz (2010) documented evidence that overvalued equity is an incentive for a manager's share option compensation, regardless of other reasons for overvaluation. Over a period of time, the price of overvalued equity should revert towards its 'true' value as information about a firm's fundamentals is revealed. The overvaluation used in their study was measured by quartile positive abnormal returns at the beginning of the year and positive price-to-earnings (P/E) ratios at the beginning of the year of the entire sample. Chi & Gupta (2009) was the first paper to investigate the association between overvaluation and accruals management and to examine how overvaluation-induced earnings management affects a firm's future performance, by using a sample of U.S. data from 1964 to 2003. Overvaluation was measured using quartiles of book-value ratios. The authors found that overvaluation was economically and statistically positively associated with subsequent

income-increasing earnings management and overvaluation-induced income-increasing earnings management was negatively associated with the operating performance and future abnormal stock returns. Moreover, this negative relationship became more pronounced as prior overvaluations intensify. The results suggest that overvaluation intensifies accruals management, which confirms Jensen's conjecture that equity overvaluation induces managers to manage the earnings. Habib et al. (2013) examined the relationship between overvalued equity firms and audit fees in U.S. context using three proxies for overvaluation (positive P/E ratios at the beginning of the year; positive price-to-book (P/B) ratios at the beginning of the year; positive abnormal returns at the beginning of the year). Their results show that auditors charge higher audit fees for customers posing aggressive earnings management because of incentives of overvaluation. Marciukaityte & Varma (2008) examined the agency costs of overvaluing equity in earnings management by investigating a sample of 526 firms that restated their earnings from 1990 to 2001. The study found that a considerable overvaluation of equity pushes managers to manage earnings, but when investors notice earnings restatements, they re-evaluate overvalued firms to correct them for misstating the overvaluation and a loss of confidence in the managers. Extending Marciukaityte & Varma's (2008) study, Baderstcher (2011) focused on the degree and duration of overvaluation on the 'evolution' of earnings management, from accruals management to manipulating real activities to non-GAAP earnings management. The author examined the association between overvalued equity and management's use of alternative within-statutory earnings management and non-statutory earnings management, where within-statutory earnings management was measured by accruals earnings management and real activities earnings management. Non-statutory earnings management was measured by firms whose restatements raise questions about the quality of financial reporting. The study found that the longer a firm is overvalued, the greater is the amount of total within-statutory earnings

management, and furthermore, managers engage in accruals earnings management in the early stage of overvaluation; they then resort to real activities earnings management to sustain their overvaluation; at later stage of overvaluation, managers are more likely to engage in non-GAAP earnings management. These results suggest that equity overvaluation plays a significant role in managers choosing to use alternative earnings management mechanisms. Coulton et al. (2014) examined the extent to which having overvalued equity motivates firms to beat earnings benchmarks and whether beating the benchmark can be interpreted as income-increasing earnings management, by using a sample of listed ASX non-financial firms over the period from 1996 to 2007. Their study suggests that overvaluation-related incentives encouraging earnings management, overvalued benchmark beaters have higher levels of abnormal accruals than other firms that beat benchmarks.

3.3.4 Development of hypotheses

Jensen (2005) proposed that the agency costs of overvalued equity stems from manager's who cannot, except by pure luck, produce an earnings performance to maintain an overvalued stock price without participating in earnings management techniques. Managers manage earnings so they don't have to report a firm's true value as being lower than expected earnings, and be severely punished by the market (Skinner & Sloan, 2002). According to the agency theory of overvalued equity, managers of overvalued firms not only reject market correction of overvalued stock prices, they also tend to sustain overvaluation by engaging in earnings management that increases reported earnings because overvaluation is an instant step towards increasing their welfare via incentives such as bonuses and stock options that are usually connected with firm performance (Badertscher, 2011). The underlying assumption of this paper, which builds on Jensen's (2005) agency theory of overvalued equity, is that

overvaluation induces towards earnings management and the duration of overvaluation leads to managers' using trade-off different earnings management techniques.

There are a myriad of earnings management choices that managers can use to disguise true economic performance in order to sustain overvaluation. Indeed, the flexibility of accounting reporting policy provides opportunities for managers to engage in earnings management that makes the firm appear less risky or more profitable than it really is (Fields et al., 2001; Graham et al., 2005), so when deciding which type of earnings management to utilise, managers must consider the expected costs and benefits of alternative earnings management mechanisms. Each accounting choice has its costs and benefits, but the net incentives (benefits minus costs) will ultimately determine management's choice of alternative earnings management mechanisms (Palmrose et al., 2004; Desai et al., 2006).

Accruals earnings management is a popular choice because it has no first-order effect on cash flows, it can be completed at end of a period once the amount of pre-accrual management earnings is known, and it is less likely to destroy long-term firm value (Badertscher, 2011; Doukakis, 2014; Gunny, 2010). However, accruals earnings management has limitations. First, aggressive choices about accruals are at a higher risk of regulatory litigation and scrutiny because accrual accounting choices are subject to auditor scrutiny, and high levels of accrual manipulation tend to be discovered and detected by auditors and regulators (Graham et al., 2005), especially for public listed firms. Second, the reversing nature of accruals earnings management can be problematic because a firm must conquer the potential reversal of last year's accruals earnings management in order to influence the current year's earnings (Badertscher, 2011). Due to the reversing nature of accruals, a firm's business operations and previous years' accruals management may limit their flexibility to apply accrual earnings

management. Studies argue that firms that used accrual income management extensively in previous years tend to shift to manage other earnings management techniques in the current period, especially if they have a continued motivation to manage earnings (Gunny, 2010; Alhadab et al., 2015).

Opportunistic underlying earnings reporting is less likely to be identified by stakeholders than accruals earnings management because it is more likely to go undetected and will not be audited. From a valuation perspective, if the probability of detecting an earnings management technique is low, it may be less costly than other earnings management techniques (Badertscher et al., 2012). Another advantage of opportunistic underlying earnings reporting is that it enables management to manage earnings by large amounts without reversing, thus enabling management to achieve specific benchmarks and sustain overvalued equity (Black et al. 2014; Badertscher, 2011). However, opportunistic underlying earnings management is not without costs. The studied have found that the opportunistic non-statutory earnings management is most egregious forms of earnings management because of severe share prices decline when investors detect the non-statutory earnings management and the reputational costs that managers' carry in managerial labour markets (Palmrose et al., 2004; Graham et al., 2005; Desai et al., 2006; Mizik & Jacobson, 2007).

Along with the agency theory of overvalued equity conjecture, this paper posits that firms with overvalued equity are more likely to engage in earnings management (either accruals earnings management or opportunistic underlying earnings reporting). Moreover, this paper assumes that duration of overvaluation induces managers to use different earnings management mechanisms. Specifically, in the early stage of overvaluation, managers are more likely to use accruals earnings management. But since accruals earnings management

has limitations, this paper assumes that the longer a firm is overvalued, the greater the incentive to disclose underlying earnings and report them in an opportunistic manner to sustain the overvalued equity. Therefore, the following hypotheses are presented:

H5: Overvalued equity firms are more likely to engage in earnings management (either accruals earnings management or opportunistic underlying earnings reporting).

H6: The longer firms are overvalued, the more likely it is that managers will disclose underlying earnings opportunistically.

Prior research has indicated that once a firm becomes constrained in its ability to manage earnings, it either stops or engages in a different type of earnings management (Ettredge et al., 2010; Badertscher et al., 2011). In order to provide further evidence on how earnings management choices interact as the duration of overvaluation increases, this study examines a subset of firms that are likely to be constrained in their ability to manage earnings through accruals. That is, if the duration of overvaluation forces managers to engage in earnings management, as suggested by Jensen (2005), then the subset of constrained accrual management firms will not use accruals earnings management and will probably only engage in opportunistic underlying earnings management. Therefore, the following hypothesis is made:

H7: Accruals earnings management constrained firms only disclose underlying earnings and do so opportunistically to sustain the overvaluation.

3.4 Research design

3.4.1 Measurement of accruals earnings management

Accruals quality

The quality of accruals is very important in determining the reliability of earnings information for users because it takes the view that high quality earnings map more closely into cash flows (Harris et al., 2000). Dechow & Dichev (2002) viewed the accruals matching function to cash flows as being of very important because accruals expect future cash collections/payments and reverse them when cash previously recognised in accruals is received/paid. Thus, Dechow & Dichev (2002) proposed and tested the quality of accruals based on the observations that the total current working capital accrual earnings maps into operating cash flows over the last period, the current period, and the next period. The unexplained portion of the variation in working capital accruals is an inverse measure of accruals quality (a larger unexplained portion indicates poorer quality), while the high unexplained portion of variations in working capital accruals error, indicates low quality accruals (Francis et al., 2005).

The measure of accruals quality used in this paper is based on Dechow & Dichev's (2002) measure where the unexplained portion of the variation in working capital accruals is measured as the standard deviation in the residuals using a 5-year rolling window that ends in year 2012 for firm j , year t in the following multivariate equation (7).

$$TCA_{j,t} = \alpha_0 + \alpha_1 CFO_{j,t-1} + \alpha_2 CFO_{j,t} + \alpha_3 CFO_{j,t+1} + v_{j,t} \quad (7)$$

Where: j -firm observations; t -years from 2005 to 2012; $TCA_{j,t}$ is firm j 's current accruals in year t , $=(\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STD_{j,t})$, scaled by the total assets at the beginning of

year t ; $CFO_{j,t}$ is cash flow from operations in year t , is calculated as earnings before tax ($E_{j,t}$) less total accruals ($TA_{j,t}$)¹⁷, scaled by the total assets at the beginning of year t ; $v_{j,t}$ is residuals from Equation (7) representing accrual quality ($AQ_{j,t}$).

Innate factors of firms and discretionary accruals earnings management

Accruals quality is jointly determined by the relevance of underlying financial performance to decisions made, and by the ability of the accounting system to measure performance (Dechow, 2004; Dechow et al., 2010; Francis et al., 2006). Therefore, accruals quality is affected by two factors: those that reflect the innate features of firms and those that reflect discretionary sources. Innate features are derived from business models, and the operating risk and operating environments. Previous studies showed that innate factors accounted for around 50% of variations in the earnings quality metric (e.g., Francis et al., 2005; Francis et al., 2006; Francis et al., 2008a). Discretionary sources stem from the process of financial reporting and include the quality of the information systems, managerial financial reporting implementation decisions, judgments and estimates, monitoring, governance, and regulatory scrutinies (Dechow, 2004; Dechow et al., 2010; Francis et al., 2006; Francis et al., 2008a; Francis et al., 2005). Researchers consider innate factors as being slow to change relative to factors that affect the quality of discretionary earnings; that is, they are perceived as predetermined at any given reporting date, but are susceptible to modification over time (Francis et al., 2006; Dechow et al., 2010).

¹⁷ $TA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STD_{j,t} - DEP_{j,t}$; $\Delta CA_{j,t}$ = firm j 's change in current assets between year $t-1$ and t , scaled by total assets at the beginning of year t ; $\Delta CL_{j,t}$ = firm j 's change in current liabilities between year $t-1$ and t , scaled by total assets at the beginning of year t ; $\Delta Cash_{j,t}$ = firm j 's change in cash between year $t-1$ and t , scaled by total assets at the beginning of year t ; $\Delta STD_{j,t}$ = firm j 's change in debt in current liabilities between year $t-1$ and t , scaled by total assets at the beginning of year t ; $DEP_{j,t}$ = firm j 's depreciation and amortization expense in year t , scaled by total assets at the beginning of year t .

To separate the innate factors and discretionary accruals components (i.e., accruals earnings management) ($AM_{j,t}$) from accruals quality ($AQ_{j,t}$), firm size ($Size_{j,t}$), standard deviation of cash flow from operations ($Cfo_{j,t}$), standard deviation of sales ($Sales_{j,t}$), and length log operating cycle ($Opcycle_{j,t}$), the incidence of earnings losses ($NegEarn_{j,t}$) and earnings variability ($SDE_{j,t}$) are selected as innate factors¹⁸. Those six innate factors are regressed on accruals quality ($AQ_{j,t}$) as follows:

$$AQ_{j,t} = a_0 + a_1Size_{j,t} + a_2Opcycle_{j,t} + a_3NegEarn_{j,t} + a_4Cfo_{j,t} + a_5Sales_{j,t} + a_6SDE_{j,t} + e_{j,t} \quad (8)$$

Where : j -firm observations, t -years from 2009 to 2012; $AQ_{j,t}$ is the standard deviation of residuals ($v_{j,t}$) from Equation (7) for firm j , in year t ; $Size_{j,t}$ is natural logarithm of the total assets for firm j , at the beginning of year t ; $Opcycle_{j,t}$ is natural logarithm of days of accounts receivable plus days of inventory for firm j , in year t ; $Cfo_{j,t}$ is standard deviation of cash flows from operations scaled by beginning total assets, computed using a 5-year rolling window ended in year 2012 for firm j , year t ; $Sales_{j,t}$ is standard deviation of sales revenue scaled by beginning total assets, computed using a 5-year rolling window ended in 2012 for firm j , year t ; $NegEarn_{j,t}$ is firm's proportion of losses over the prior 5 years for firm j , in year t . $SDE_{j,t}$ is measured by standard deviation earnings before tax using a 5-year rolling window ending in 2012 for firm j , year t . Consistent with Francis et al. (2005), Equation (8) is measured by cross-sectional by industry¹⁹ for each year. Since the cross-sectional models require at least 10 firms in one industry (Aldamen & Duncan, 2013), this study combined the two smallest industry groups into one group and included the software industry in the health care industry,

¹⁸ Following Francis et al.'s (2005) study, this paper includes firm size, standard deviation of cash flow from operations, standard deviation of sales, natural logarithm of operating cycle, and incidence of earnings losses affecting accruals quality as firms' innate factors. Prior studies have found that earnings variability is highly significantly related to accruals quality and suggest that the greater variability in earnings lower accruals quality (Dechow & Dichev, 2002; Francis et al., 2004; 2005). Therefore, earnings variability is included as innate factor affecting accruals quality rather used as general control variable as paper one did.

¹⁹ As the sample years only have 4 years, this limits the paper to use time-series model.

giving a total of six industries for each year. The industry type is based on GICS industry sector. 8 industries were included in the sample: energy, materials, industrials, consumer discretionary, health care, software, telecommunication services, and utilities. The telecommunication services (6 firms) and the utilities (6 firms) were combined into one group. Software was included in the health care category because they all belong to high-tech industries (3 firms) for the purpose of measuring cross-sectional Equation (8). This paper follows Aldamen & Duncan's (2013) measurement of industry type. In Aldamen & Duncan (2013)'s study, the telecommunication services and utilities were combined into one industry group to measure the cross-sectional model. $AM_{j,t}$ is the absolute value of residuals ($e_{j,t}$) of Equation (8) presenting the discretionary accruals earnings management for firm j , in year t . The predicted values from Equation (8) are the estimated accruals innate factors. This paper also attempts to examine the influence of income-increasing accruals earnings management on overvaluation and expects that when managers are less likely to use income-increasing accruals earnings management they tend to use income-increasing underlying exclusions to overvalue firms' equity. Thus, following previous studies (e.g., Baber et al., 2011; Laksmana & Yang, 2014), this paper measures the income-increasing accruals earnings management ($InAM_{j,t}$) by dummy variable that the positive residuals ($e_{j,t}$) of Equation (8) are coded as '1', '0' otherwise.

3.4.2 Measurement of equity overvaluation

Following Habib et al.'s (2013) study, this paper measures the value of equity using positive P/E ratios and P/B ratios at the beginning of the year as proxy for equity overvaluation²⁰. The

²⁰ Because empirical evidence supports that equity overvaluation is positive related to the subsequent income-increasing earnings management (Chi & Gupta, 2009) and highly valued firms tend to use discretionary accruals to manage earnings upwards in the year following the overpricing (Houmes & Skantz, 2010). Thus, this paper, following Habib et al.'s (2013)

P/E ratio was traditionally used to value firms because P/E valuation is basically a substitute for the well-established discounted earnings model. Voluminous studies have supported evidence that P/E ratios can be used for equity valuation (e.g., Beaver, 1968; Easton & Harris, 1991), but the applicability of P/E ratios in valuation has been challenged by practitioners and academics in recent decades (e.g., Kim & Ritter, 1999; How & Howe, 2001). Since transitory earnings account for a large part of profits and an increasing number of firms engage in earnings management, the usefulness of earnings in valuation declines because of issues connected with P/E ratios (Collins et al., 1997; Collins et al., 1999), where the P/B ratios have become an increasingly important valuation price-multiple. The value relevance of equity's book value is well documented (Collins et al., 1997; Brief & Zarowin, 1999), because according to Brief & Zarowin (1999), when the value relevance of equity's book value is compared to dividends and earnings, equity's book value had the highest explanatory power. The book value of equity has been perceived as better equity valuation over earnings valuation because it is a relatively more steady measure that produces a less noisy estimate of long-term firm value (Damodaran, 1996). However, since different firms identify different and various numbers of intangible assets on their books, the price-multiple calculated using the book value of equity might not be applied to firms with different proportions of unrecognised intangible assets (How et al., 2007, p.106). Since the P/E ratios and P/B ratios have limitations, the valuation of equity is measured by the average of P/E ratios and P/B ratios in this paper. Using aggregative measurement ($PBPE_{j,t}$) by averaging the two is appropriate because P/E ratios and P/B ratios present one factor (see, Table 12 panel B factor analysis). This research design is framed to be consistent with Jensen's (2005) view that overvaluation drives managers to manipulate earnings.

study, uses the ratios at the beginning of year t . Moreover, as this paper asserts that overvaluation induces earnings management, positive P/E and P/B ratios are used to measure overvaluation.

In order to identify overvalued firms, firms are ranked based on the $PBPE_{j,t}$ ratios for each year, where firms in the highest quartile rank²¹ of $PBPE_{j,t}$ indicate they are overvalued. To capture the notion of sustained overvaluation or duration of overvaluation, this paper identifies firms that have been in the top quartile of $PBPE_{j,t}$ for 0 ($Over_{0j,t}$), 1($Over_{1j,t}$), 2($Over_{2j,t}$), 3($Over_{3j,t}$) consecutive years. The P/E and P/B ratios were collected from the Datanalysis database.

3.4.3 Empirical models for testing H5 & H6

The models for testing H5 and H6 are designed as following:²²

$$\text{Earnings management}_{j,t} = a_0 + b_1 \text{Over}_{j,t} + c_1 \text{Controls}_{j,t} + \text{Year effects} + \text{Industry effects} + e_{j,t} \quad (9)$$

$$\text{Earnings management}_{j,t} = a_0 + \sum b_{0-3} \text{Over}_{(i)j,t} + c_1 \text{Controls}_{j,t} + \text{Year effects} + \text{Industry effects} + e_{j,t} \quad (10)$$

Where: j-firm observations, t-years from 2009 to 2012.

Dependent variables: Earnings management_{j,t} is either underlying earnings disclosure or accruals earnings management. Underlying earnings disclosures are represented by $UE_{j,t}$ and $InEx_{j,t}$. $UE_{j,t}$ is a dummy variable that equals 1 if j firm discloses a underlying earnings in year t, and zero otherwise; $InEx_{j,t}$ is income-increasing underlying earnings exclusions measured by a dummy variable that equals 1 if j firm discloses a underlying earnings number that is greater than the statutory earnings in year t, and zero otherwise. Accruals earnings management is measured by $AM_{j,t}$ and $InAM_{j,t}$. $AM_{j,t}$ is the absolute value of discretionary accruals earnings management measured by the cross-sectional residuals ($e_{j,t}$) of Equation (8) for firm j, year t. $InAM_{j,t}$ is income-increasing earnings management, where equals 1 if residuals ($e_{j,t}$) of Equation (8) is positive, 0 otherwise.

²¹ Unlike Badertscher's (2011), this paper uses quartile value rather than quintile value due to the small sample size. Therefore, following Habib et al.'s (2013) study, this paper measures overvalued equity using quartile values of PBPE.

²² The sample data used in this paper is the same as the data used in the paper one, but for brevity they are not discussed here again.

Interested variables: $Over_{j,t}$ is a dummy variable which equals 1 if j firm is in the top quartile of $PBPE_{j,t}$ in year t , and 0 otherwise. $Over_{(i)j,t}$ is dummy variable which equals 1 if j firm has been in the top quartile of $PBPE_{j,t}$ for (i) consecutive years, and 0 otherwise. Specifically, $Over_{0j,t}$ equals 1 if j firm is overvalued once during the sample years from 2009 to 2012, and 0 otherwise. $Over_{1j,t}$ equals 1 if j firm is overvalued by one consecutive year during the sample years, and 0 otherwise. $Over_{2j,t}$ equals 1 if j firm is overvalued two consecutive years during the sample years, and 0 otherwise. $Over_{3j,t}$ equals 1 if j firm is overvalued for three consecutive years during the sample years, and 0 otherwise.

3.4.4 Control variables for equity overvaluation and earnings management

Following the literature, this paper includes several control variables that influenced the likelihood of firm overvaluation and earnings management.

Accruals-specific controls: following prior studies (e.g., Badertscher, 2011; Cohen & Zarowin, 2010; Black et al., 2014), this paper includes a dummy variable $Litigation_{j,t}$ which equals 1 if j firm is in a high litigation risk industry²³ to capture the litigation penalties. This paper includes $Litigation_{j,t}$ as a specific control variable because accrual earnings management is more likely than opportunistic underlying earnings reporting to be detected and punished, so greater perceived litigation penalties should decrease the tendency for accruals earnings management. Another specific control variable for accruals widely recorded in accounting literature is the Big4 auditors. Following prior studies (e.g., Doukakis, 2014; Badertscher, 2011; Black et al., 2014), this paper includes $Big4_{j,t}$ as a specific control

²³ Following Barton & Simko (2002) and Cohen & Zarowin (2010)'s studies, high litigation industries are pharmaceuticals/biotechnology, Software & Services industries. The pharmaceutical/biotechnology is a sub group of health care sector. The author relooked at the industry type based on the GISC industry group to find out which firms belong to pharmaceutical/biotechnology industry group.

variable that is measured by a dummy variable that equals 1 if j firm's auditor comes from Big 4 audit companies, and 0 otherwise. This variable is included because prior literature suggests that auditors play a monitoring role and the presence of a Big 4 auditor restricts accrual earnings management practices (Francis & Wang, 2008). This paper expects that increased scrutiny enhances the probability of discovering accrual earnings management, but it should not affect a manager's decision to opportunistically disclose underlying earnings because it typically falls outside an auditor's responsibility.

Underlying earnings-specific controls: prior research indicates that meeting the earnings targets and avoiding the current statutory losses are a useful tool to explain pro forma earnings disclosures and suggest that managers have strong incentives to manipulate non-statutory earnings when firms miss their earnings target or make current statutory earnings losses (e.g., Black & Christensen, 2009; Barth et al., 2012; Hitz, 2010; Isidro & Marques, 2014; Doyle et al., 2013; Elshafie et al., 2010). Paper one (i.e., chapter two) of this thesis also confirmed this assertion, so this paper includes the dummy variable $Loss_{j,t}$ which equals 1 if j firm make current statutory earnings loss in year t , and 0 otherwise, while the dummy variable $Meet_{j,t}$ which equals 1 if j firm's current statutory earnings is greater than or equal to previous statutory earnings, and 0 otherwise.

General control variables were discussed in section (2.4.4) of this thesis, but for the sake of brevity it does not present detailed explanations of the general control variables used here again. Leverage ratio ($Leverage_{j,t}$) (e.g., Watts & Zimmerman, 1986; DeFond & Jiambalvo, 1994; Doukakis, 2014; Francis & Wang, 2008); firms' growth ($MtoB_{j,t}$ & $SalesG_{j,t}$) (e.g., Myers, 1977; Lev & Zarowin, 1999; Lougee & Marquardt, 2004; Doyle et al., 2013; Black et al., 2014; Zang, 2012); firms' profitability ($ROE_{j,t}$) (e.g., Petroni, 1992; DeAngelo et al.,

1994; Balsam et al., 1995; Doyle et al., 2007a; Doyle et al., 2013; Frankel et al., 2011; Doukakis, 2014); Capital intensity ($Capital_{j,t}$) (e.g., Baginski et al., 1999; Lev, 1983; Francis et al., 2004); Balance sheet bloat ($NOA_{j,t}$) have been included as general control variables for Equation (9) and Equation (10). The measurement of firm size has been replaced by $Mktcap_{j,t}$, which is measured by the natural logarithm of market capitalisation at the beginning of year t . This paper uses market capitalisation to measure firm size rather than the total assets because market capitalisation is a more precise proxy for firm size in the context of overvaluation (Doukakis, 2014).

This study includes underlying earnings disclosure (accruals earnings management) as control variables because previous literature indicated that accrual earnings management and non-statutory earnings disclosures are substitute mechanisms of earnings management (Black et al., 2014; Doyle et al., 2013; Elshafie et al., 2010), that is, if the dependent variable is accruals earnings management ($AM_{j,t}$ and $\ln AM_{j,t}$), then it controls for the underlying earnings disclosures ($UE_{j,t}$ and $\ln Ex_{j,t}$), and the contrary applies because firms may follow an overall earnings management strategy and utilise a mix of underlying earnings disclosure and accruals earnings management tools, or they can choose between the two earnings management mechanisms and apply the one that is least expensive for them (Cohen et al., 2008; Doukakis, 2014).

Year and industry effects are included as control variables. For year effects, 3 dummy variables are generated (year 2010=1, and others zero; year 2011=1, and others zero; year 2012=1, and others zero) to control for the unobservable confounding variables that differ from time to time, but are constant across the industries. Year 2009 was dropped by Stata software because the fixed-effects model includes a constant. For industry effects, in order to

be consistent with the Equation (8) to measure accruals earnings management, 5 dummy variables are generated (energy=1, and others zero; materials =1, and others zero; industrials=1, and others zero; health care or software & services =1, and others zero; =1, telecommunication or utilities=1, and others zero) to control for the unobservable confounding variables that differ across industries, but are constant over time. Consumer discretionary was dropped by Stata software because the fixed-effects model includes a constant, and it follows Aldamen & Duncan's (2013) measurement of industry type. In Aldamen & Duncan (2013)'s study, the telecommunication services and utilities were combined into one industry group to measure the cross-sectional model, while the software was combined with the health care category because they all belong to high-tech industries.

3.4.5 Limited ability using accruals earnings management (H7)

Given that an overvalued firm has decided to manage reported earnings, this paper now seeks to find whether the constraints of using accruals earnings management would induce managers to disclose underlying earnings and disclose them in an opportunistic manner. Due to the constrained flexibility of accruals, the ability of managers to manage accruals upwards in the current period is limited by accrual management activities in previous periods. This paper follows prior studies (e.g., Barton & Simko, 2002; Zang, 2012; Badertscher, 2011) where net operating assets ($NOA_{j,t}$) is used as a proxy for the extent of accruals management in previous periods to represent a firm's ability to manage earnings using accruals. If the net operating assets at the beginning of the year are high, then managers' abilities to use accruals to manipulate earnings are reduced in the current year because the balance sheet and income statement are articulated, and therefore abnormal accruals shown in past earnings can also be shown in net assets, and hence the latter are overstated when firms have practiced accruals

management in previous times (Black et al., 2014; Zang, 2012; Barton & Simko, 2002). Since the underlying earnings exclusions do not include a practical accounting system entry (there are no debits and credits adjustments required), therefore, opportunistic underlying earnings reporting is not necessarily constrained by the balance sheet, as accruals would be (Doyle et al., 2013).

In order to investigate H7, this paper focuses on a subsample of firms that are constrained in their ability to engage in further accruals management. The constrained accruals earnings management ability is measured by net operating assets ($NOA_{j,t}$). The high values of $NOA_{j,t}$ represent low ability to manipulate earnings using accruals in the current year. Specifically, each year is ranked on $NOA_{j,t}$ and then the upper median²⁴ of $NOA_{j,t}$ is selected as a proxy of accruals constrains firms; this allows for an examination of whether overvalued firms that lack flexibility overstate earnings through accruals but do not engage in accruals earnings management, or whether they only disclose underlying earnings and engage in opportunistic underlying earnings reporting for the duration of overvaluation.

3.5 Analyses and Results

3.5.1 Descriptive statistics of variables for paper two

Table 11 documents descriptive statistics of the variables for earnings management and equity overvaluation variables and shows the differences between the top and bottom quartiles. For the four earnings management mechanisms ($AM_{j,t}$, $InAM_{j,t}$, $UE_{j,t}$ and $InEx_{j,t}$), the mean (median) of $AM_{j,t}$ is 0.467 (0.183), with an interquartile range of (0.076) to (0.425). The mean amount of $UE_{j,t}$ is high (0.523) compared to the three other earnings management

²⁴ Unlike Badertscher's (2011) study, median value is selected as benchmark rather than quintile because of the limitation of the sample size in this study.

mechanisms. The median of $\text{InAM}_{j,t}$ (0.000) is lower than the median of $\text{InEx}_{j,t}$ (1.000), which means that sample firms are more likely to use income-increasing underlying earnings exclusions than income-increasing accruals earnings management. Looking at the overvaluation variables, the mean and median of $\text{P/E}_{j,t}$ (0.218 and 0.145, respectively) are higher than the mean and median of $\text{P/B}_{j,t}$ (0.046 and 0.020, respectively), but the number of observations of $\text{P/E}_{j,t}$ (471) is much lower than the number of observations of $\text{P/B}_{j,t}$ (561). The mean (median) of $\text{PBPE}_{j,t}$ is 0.133 (0.085), with an interquartile range of (0.064) to (0.119). This paper also presents the descriptive statistics of $\text{PBPE}_{j,t}$ for each individual year. Compared to the three other years, $\text{PBPE}_{j,2009}$ had data with the most variations, with a standard deviation of 0.221, and then the variation declined in the following years.

Table 11: Descriptive statistics for earnings management and equity overvaluation variables

Variable	Obs	Mean	LowQ	Median	TopQ	Std. Dev.
AQ _{j,t}	566	0.195	0.046	0.085	0.196	0.267
AM _{j,t}	566	0.467	0.076	0.183	0.425	1.309
InAM _{j,t}	566	0.472	0.000	0.000	1.000	0.500
UE _{j,t}	566	0.523	0.000	1.000	1.000	0.500
InEx _{j,t}	566	0.360	0.000	1.000	1.000	0.481
P/E _{j,t}	471	0.218	0.110	0.145	0.190	0.365
P/B _{j,t}	561	0.046	0.012	0.020	0.037	0.197
PBPE _{j,t}	469	0.133	0.064	0.085	0.119	0.264
PBPE _{j,2009}	107	0.122	0.064	0.082	0.115	0.221
PBPE _{j,2010}	114	0.117	0.057	0.073	0.112	0.166
PBPE _{j,2011}	123	0.115	0.072	0.090	0.129	0.081
PBPE _{j,2012}	125	0.097	0.070	0.086	0.112	0.044

Note: AQ_{j,t} is accruals quality measured by the standard deviation of five-year windows rolling of residuals of Equation (7) for firm j, in year t. AM_{j,t} is absolute ‘abnormal’ accruals measured by residuals of Equation (8) for firm j, in year t. InAM_{j,t} is positive of ‘abnormal’ accruals (the positive of residuals (e_{j,t}) of Equation (8)), which represents income-increasing accruals earnings management for firm j, in year t. UE_{j,t} is dummy variable which equals 1 if j firm disclose underlying earnings in year t, 0 otherwise. InEx_{j,t} is dummy variable which equals 1 if j firm disclose underlying earnings greater than statutory earnings in year t, 0 otherwise. P/E_{j,t} is price to earnings ratio for j firm at the beginning of year t which is collected from DatAnalysis database. P/B_{j,t} is price to book ratio for j firm at the beginning of year t which is collected from DatAnalysis database. PBPE_{j,t} is average of P/E_{j,t} and P/B_{j,t}. PBPE_{j,2009} is average of P/E_{j,t} and P/B_{j,t} for firm j at the beginning of year 2009. PBPE_{j,2010} is average of P/E_{j,t} and P/B_{j,t} for firm j at the beginning of year 2010. PBPE_{j,2011} is average of P/E_{j,t} and P/B_{j,t} for firm j at the beginning of year 2011. PBPE_{j,2012} is average of P/E_{j,t} and P/B_{j,t} for firm j at the beginning of year 2012.

3.5.2 Pearson and Spearman correlations and factor analysis of variables for paper two

Table 12 and panel A shows the pearson and spearman correlations of key variables for earnings management and equity overvaluation. Since the correlations of general control variables have already been presented in section (2.5.3) of chapter two, the correlations of general control variables will not be repeated again here. The AM_{j,t} and UE_{j,t} is significantly and negatively correlated with a spearman correlation of -0.168, a p-value of 0.000 and a pearson correlation of -0.171, and a p-value of 0.000, respectively. The InEx_{j,t} is significantly and negatively correlated to AM_{j,t} and InAM_{j,t} under spearman and pearson correlations. These results are consistent with prior studies (Black et al., 2014; Doyle et al., 2013; Elshafie et al., 2010) where accruals earnings management and opportunistic non-statutory earnings

reporting are substitutionary earnings management mechanisms. Moving on to the correlations between earnings management mechanisms and overvaluation measurements, the correlations of $AM_{j,t}$ and $InAM_{j,t}$ are significantly and positively correlated to $Over_{0j,t}$ under a pearson correlation test (correlation=0.126, p-value=0.006) and (correlation=0.159, p-value=0.001), respectively. The correlations of $UE_{j,t}$ and $InEx_{j,t}$ are significantly positive correlated to $Over_{2j,t}$ under pearson and spearman correlations. These relationships indicate that when a firm is overvalued once in the early stage, it is more likely to apply discretionary accruals earnings management and income-increasing accruals earnings management. If the duration of equity overvaluation continues, firms then resort to underlying earnings disclosure and disclose underlying earnings opportunistically (income-increasing underlying earnings exclusions) to sustain the overvaluation. Table 12 and panel B presents the factor analysis for measuring overvaluation, and indicates that P/E ratios and P/B ratios represent one factor, so it is appropriate to combine the two measurement ratios into one variable (PBPE) to represent a firms' valuation measurement in this paper.

Table 12: Pearson and Spearman correlations for earnings management and equity overvaluation variables and factor analysis for equity overvaluation variables

Table 12 Panel A: Pearson and spearman correlations for variables

	AM _{j,t}	InAM _{j,t}	UE _{j,t}	InEx _{j,t}	Over _{j,t}	Over _{0j,t}	Over _{1j,t}	Over _{2j,t}	Over _{3j,t}
AM _{j,t}	1.000	0.077 [*]	-0.171 ^{***}	-0.132 ^{***}	0.048	0.126 ^{***}	-0.002	-0.041	-0.019
		(0.067)	(0.000)	(0.002)	(0.297)	(0.006)	(0.962)	(0.371)	(0.680)
InAM _{j,t}	-0.059	1.000	-0.033	-0.127 ^{***}	-0.035	0.159 ^{***}	0.017	-0.143 ^{***}	-0.096 ^{**}
	(0.201)		(0.436)	(0.003)	(0.452)	(0.001)	(0.713)	(0.002)	(0.038)
UE _{j,t}	-0.168 ^{***}	-0.071	1.000	0.717 ^{***}	0.049	-0.037	0.037	0.201 ^{***}	-0.086 [*]
	(0.000)	(0.125)		(0.000)	(0.286)	(0.420)	(0.426)	(0.000)	(0.064)
InEx _{j,t}	-0.134 ^{***}	-0.151 ^{***}	0.690 ^{***}	1.000	0.052	-0.088 [*]	-0.009	0.226 ^{***}	-0.041
	(0.004)	(0.001)	(0.000)		(0.262)	(0.057)	(0.840)	(0.000)	(0.371)
Over _{j,t}	0.036	-0.035	0.049	0.052	1.000	0.394 ^{***}	0.400 ^{***}	0.443 ^{***}	0.479 ^{***}
	(0.434)	(0.452)	(0.286)	(0.262)		(0.000)	(0.000)	(0.000)	(0.000)
Over _{0j,t}	0.058	0.159 ^{***}	-0.037	-0.088 [*]	0.394 ^{***}	1.000	-0.077 [*]	-0.085 [*]	-0.095 ^{**}
	(0.211)	(0.001)	(0.420)	(0.057)	(0.000)		(0.096)	(0.065)	(0.040)
Over _{1j,t}	0.010	0.017	0.037	-0.009	0.400 ^{***}	-0.077 [*]	1.000	-0.057	-0.070
	(0.825)	(0.713)	(0.426)	(0.840)	(0.000)	(0.096)		(0.215)	(0.131)
Over _{2j,t}	0.009	-0.143 ^{***}	0.201 ^{***}	0.226 ^{***}	0.443 ^{***}	-0.085 [*]	-0.057	1.000	-0.034
	(0.850)	(0.002)	(0.000)	(0.000)	(0.000)	(0.065)	(0.215)		(0.469)
Over _{3j,t}	-0.047	-0.096 ^{**}	-0.086 [*]	-0.041	0.479 ^{***}	-0.095 ^{**}	-0.070	-0.034	1.000
	(0.307)	(0.038)	(0.064)	(0.371)	(0.000)	(0.040)	(0.131)	(0.469)	

p-value in parentheses
 $p < 0.10$, $** p < 0.05$, $*** p < 0.01$

Pearson (above) and spearman (bellow) correlations

Note: Over_{j,t} is dummy variable which equals 1 if j firm is in the top quartile of PBPE_{j,t} in year t, 0 otherwise. Over_{0j,t} equals 1 if j firm is overvalued once during the sample years from 2009 to 2012, and 0 otherwise. Over_{1j,t} equals 1 if j firm is overvalued one consecutive year during the sample years, and 0 otherwise. Over_{2j,t} equals 1 if j firm is overvalued two consecutive years during the sample years, and 0 otherwise. Over_{3j,t} equals 1 if j firm is overvalued three consecutive years during the sample years, and 0 otherwise.

Table 12 Panel B: Factor analysis for overvaluation variables

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	1.024	1.257	1.296	1.296
Factor2	-0.233	0.000	-0.296	1.000
Number of obs	469			
Retained factors	1			
Number of params	1			

Table 12 Panel B: Factor analysis for overvaluation variables (continued)

chi2(1)	234.97	
Prob>chi2	0	
Factor loadings (pattern matrix) and unique variances		
Variable	Factor1	Uniqueness
P/B ratios	0.7154	0.4882
P/E ratios	0.7154	0.4882

3.5.3 Regression results

3.5.3.1 Results for overvalued firms induce earnings management (H5)

Table 13 and panel A represents the regressions of accruals quality on innate factors for the sample period. These results generally consist of prior researches (Dechow & Dichev, 2002, Francis et al., 2004; 2005) where all the innate factors are significantly related to $AQ_{j,t}$ except $Opcycle_{j,t}$ and $Cfo_{j,t}$. $SDE_{j,t}$, $Sales_{j,t}$ and $NegEarn_{j,t}$ are significantly positive associated with $AQ_{j,t}$, (coefficient=0.128, p-value=0.008), (coefficient=0.038, p-value=0.011) and (coefficient=0.146, p-value=0.000) respectively, while $Size_{j,t}$ is negatively and significantly related to $AQ_{j,t}$ (coefficient=-0.036, p-value=0.000).

Table 13 panel B provides the results of H5 by using year industry fixed-effects regression with $AM_{j,t}$ and $UE_{j,t}$ as dependent variables. Since this paper only includes positive P/E ratios and positive P/B ratios and accruals earnings management needs 5-years of rolling window data, it leads to decrease in sample size to 469 firm-year observations. Model 17 is tested using year industry fixed-effects panel model with $AM_{j,t}$ as the dependent variable, while model 18 is measured by year industry fixed-effects logit model with $UE_{j,t}$ as the dependent variable. The results show that the $Over_{j,t}$ is positively and significantly associated with $UE_{j,t}$ (coefficient=1.044, p-value=0.000) rather than $AM_{j,t}$, suggesting that overvalued firms are

generally more likely to engage in underlying earnings disclosures, not accruals earnings management. The result also provides evidence that $AM_{j,t}$ is significantly and negatively related to $UE_{j,t}$ with a coefficient of -0.334, the p-value=0.006 in model 17 and the coefficient of -0.655, p-value=0.003 in model 18, respectively, indicating that when firms have low levels of accruals earnings management, they are more likely to disclose underlying earnings. Table 13 panel C provides the results of H5 by using year industry fixed-effects logit regressions with $InAM_{j,t}$ (model 19) and $InEx_{j,t}$ (model 20) as dependent variables. Panel C provides similar results to panel B where $Over_{j,t}$ is positively and significantly related to $InEx_{j,t}$ (coefficient=1.143, p-value=0.000) rather than $InAM$, indicating that overvalued firms are more likely to engage in income-increasing underlying earnings disclosures and not income-increasing accruals earnings management. The significantly negative relationship between $InEx_{j,t}$ and $InAM_{j,t}$ found in table 13 panel C in models 19 and 20 suggests that managers apply income increasing underlying exclusions and income-increasing accruals earnings management alternatively. These results are consistent with H5 that overvalued firms induce earnings management; that is, they apply underlying earnings disclosure and disclose them opportunistically rather than using accruals earnings management in general. These results also suggest that when managers have low levels of accruals earnings management and low levels of income-increasing accruals earnings management, they are more likely to disclose underlying earnings opportunistically. In other words the underlying earnings disclosure and opportunistic underlying earnings discourse are used by managers as alternative earnings management tools to accruals earnings management.

Table 13: Regression results for equity overvaluation and earnings management (H5)

Table 13 Panel A: the regression results of accruals quality on innate factors

AQ _{j,t}	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
NegEarn _{j,t}	0.146***	0.038	3.830	0.000	0.071 0.221
Sales _{j,t}	0.038**	0.015	2.560	0.011	0.009 0.068
Size _{j,t}	-0.036***	0.006	-5.480	0.000	-0.048 -0.023
SDE _{j,t}	0.128***	0.048	2.640	0.008	0.033 0.222
Cfo _{j,t}	0.012	0.021	0.560	0.573	-0.029 0.052
Opcycle _{j,t}	0.003	0.017	0.180	0.858	-0.031 0.037
_cons	0.383***	0.061	6.250	0.000	0.263 0.503
Number of obs.	566				
R-squared	21.53%				

Table 13 Panel B: the regression results for H5 with AM_{j,t} and UE_{j,t} as dependent variables

	Model 17 with AM _{j,t} as dependent variable				Model 18 with UE _{j,t} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
Over _{j,t}	0.101	0.148	0.680	0.494	1.044***	0.298	3.510	0.000
AM specific								
Big4 _{j,t}	-0.117	0.252	-0.470	0.642				
Litigation _{j,t}	0.364	0.363	1.000	0.317				
UE specific								
Meet _{j,t}					0.096	0.255	0.380	0.707
Loss _{j,t}					1.329***	0.438	3.030	0.002
General controls								
UE _{j,t}	-0.334***	0.121	-2.750	0.006				
AM _{j,t}					-0.655***	0.222	-2.950	0.003
Leverage _{j,t}	0.832***	0.207	4.010	0.000	1.380**	0.654	2.110	0.035
SalesG _{j,t}	-0.489**	0.230	-2.130	0.034	-1.121**	0.503	-2.230	0.026
MtoB _{j,t}	-0.004	0.084	-0.050	0.958	-0.690***	0.187	-3.690	0.000
Mktcap _{j,t}	-0.051	0.045	-1.130	0.260	0.463***	0.091	5.080	0.000
NOA _{j,t}	-0.044	0.088	-0.500	0.616	0.233	0.247	0.940	0.345
ROE _{j,t}	0.104	0.481	0.220	0.829	1.976*	1.077	1.830	0.067
Capital _{j,t}	-0.144	0.118	-1.220	0.223	0.402*	0.242	1.660	0.096
_cons	1.192**	0.540	2.210	0.028	-4.390***	1.099	-3.990	0.000

Table 13 Panel B: the regression results for H5 with $AM_{j,t}$ and $UE_{j,t}$ as dependent variables (continued)

Year effects	YES		YES
Industry effects	YES		YES
Number of obs.	469		469
R-squared	8.68%	Pseudo R-squared	17.15%

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ **Table 13: Regression results for equity overvaluation and earnings management (H5) (continued)**Table 13 Panel C: the regression results for H5 with $\ln AM_{j,t}$ and $\ln Ex_{j,t}$ as dependent variables

	Model 19 with $\ln AM_{j,t}$ as dependent variable				Model 20 with $\ln Ex_{j,t}$ as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
Over _{j,t}	-0.262	0.275	-0.950	0.340	1.143***	0.296	3.860	0.000
AM specific								
Big4 _{j,t}	-1.029**	0.473	-2.180	0.029				
Litigation _{j,t}	0.511	0.697	0.730	0.464				
UE specific								
Meet _{j,t}					-0.098	0.248	-0.400	0.692
Loss _{j,t}					1.802***	0.389	4.640	0.000
General controls								
$\ln E_{j,t}$	-0.679***	0.218	-3.120	0.002				
$\ln AM_{j,t}$					-0.748***	0.223	-3.360	0.001
Leverage _{j,t}	0.306	0.394	0.780	0.438	0.956*	0.517	1.850	0.065
SalesG _{j,t}	-0.099	0.425	-0.230	0.816	-0.641	0.500	-1.280	0.200
MtoB _{j,t}	-0.321**	0.156	-2.050	0.040	-0.588***	0.161	-3.640	0.000
Mktcap _{j,t}	0.102	0.081	1.270	0.205	0.297***	0.086	3.480	0.001
NOA _{j,t}	0.117	0.171	0.680	0.495	0.197	0.185	1.060	0.288
ROE _{j,t}	1.930**	0.927	2.080	0.037	1.392	0.917	1.520	0.129
Capital _{j,t}	-0.348	0.224	-1.550	0.121	0.763***	0.238	3.210	0.001
_cons	1.206	0.994	1.210	0.225	-4.536***	1.053	-4.310	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	469				469			
Pseudo R-squared	13.49%				15.33%			

**Table 13: Regression results for equity overvaluation and earnings management (H5)
(continued)**

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: $Size_{j,t}$ is natural logarithm of the total assets for firm j , at the beginning of year t ; $Opcycle_{j,t}$ is natural logarithm of days of accounts receivable plus days of inventory for firm j , in year t ; $Cfo_{j,t}$ is standard deviation of cash flows from operations scaled by beginning total assets, computed using a 5-year rolling window ended in year 2012 for firm j , year t ; $Sales_{j,t}$ is standard deviation of sales revenue scaled by beginning total assets, computed using a 5-year rolling window ended in 2012 for firm j , year t ; $NegEarn_{j,t}$ is firm's proportion of losses over the prior 5 years for firm j , year t . $Big4_{j,t}$ equals 1 if j firm is audited by Big 4 auditors, 0 otherwise. $SDE_{j,t}$ is measured by standard deviation of earnings before tax using a 5-year rolling window ending in 2012 for firm j , year t . $Litigation_{j,t}$ equals 1 if j firm is in one of pharmaceuticals/biotechnology, Software and Services industries, 0 otherwise. $Meet_{j,t}$ is dummy variable that equals 1 if j firm's earnings before tax in year t is greater or equal to earnings before tax in year $t-1$, and zero otherwise. $Loss_{j,t}$ is dummy variable that equals 1 if j firm report statutory earnings in year t , 0 otherwise. $MtoB_{j,t}$ is measured by the market value of equity divided by the book value of equity for firm j , in year t . $ROE_{j,t}$ is earnings before tax divided by average shareholders' equity for firm j , in year t . $Leverage_{j,t}$ is measured by short-term and long-term debt divided by total assets for firm j , in year t . $NOA_{j,t}$ is measured by shareholders' equity less cash and cash equivalent plus total debt divided by lagged sales for firm j , at the beginning of the year t . $SalesG_{j,t}$ is the sales for firm j , year t minus the sales for firm j , in year $t-1$, then divided by the sales for firm j , in year t . $MktCap_{j,t}$ is measured as the natural logarithm of the market capitalisation of the firm at the beginning of year t for firm j . $Capital_{j,t}$ is capital intensity measured by the ratio of net book value of PPE to total assets for firm j , in year t .

3.5.3.2 Results for the duration of overvaluation and earnings management mechanisms (H6)

Table 14 Panel A shows the results of H6 using the year industry fixed-effects regression models with $AM_{j,t}$ and $UE_{j,t}$ as dependent variables. Model 21 is tested using the year industry fixed-effects panel model with $AM_{j,t}$ as the dependent variable, while model 22 is measured by the year industry fixed-effects logit model with $UE_{j,t}$ as the dependent variable. The result of model 21 shows that only $Over_{0,j,t}$ is significantly positive related to $AM_{j,t}$ (coefficient=0.455, p-value=0.052), while the result of model 22 shows that $Over_{1,j,t}$ and $Over_{2,j,t}$ are significantly positively related to $UE_{j,t}$ (coefficient=0.985, p-value=0.048) and (coefficient=2.748, p-value=0.000), respectively. The coefficient on $Over_{2,j,t}$ is greater than $Over_{1,j,t}$ which suggests that the longer a firm is overvalued the more likely it is to disclose underlying earnings. It appears that overvalued firms use accruals earnings management once for the first year and then it level off. By commencing overvaluation for one consecutive year, firms begin to engage in underlying earnings disclosure. Table 14 Panel B shows the results of H6 by using year industry fixed-effects regression models with $InAM_{j,t}$ and $InEx_{j,t}$ as the dependent variables. Model 23 and model 24 are tested using year industry fixed-effects logit models with $InAM_{j,t}$ and $InEx_{j,t}$ as dependent variables respectively. The results

of model 23 show that $Over_{0j,t}$ is positively and significantly related to $InAM_{j,t}$ (coefficient=0.927, p-value=0.056), while $Over_{2j,t}$ and $Over_{3j,t}$ are significantly negatively associated with $InAM_{j,t}$ (Coefficient=-1.169, p-value=0.011), (Coefficient=-0.788, p-value=0.050), respectively. These results suggest that in the early stage of overvaluation, firms are more likely to engage in income-increasing accruals earnings management, at the later stage of overvaluation, and managers are less likely to use income-increasing accruals earnings management. This could be explained by the reversing nature of accruals earnings management where managers' abilities to use income-increasing accruals earnings management have decreased. Table 14 panel B model 24 presents evidence that $InEx_{j,t}$ is positively and significantly associated with $Over_{1j,t}$ (Coefficient=0.848, p-value=0.065), $Over_{2j,t}$ (Coefficient=2.444, p-value=0.000), $Over_{3j,t}$ (Coefficient=0.740, p-value=0.084), and therefore after a firm has been overvalued once at an early stage using income-increasing earnings management, firms sustain their overvaluation by engaging in opportunistic underlying earnings reporting to define underlying earnings as being higher than statutory earnings. This result, coupled with the finding in panel A of table 14, suggests that after an extended period overvaluation, firms are unable to engage in further accruals earnings management and therefore resort to opportunistically reporting underlying earnings. These results prove H6 of this thesis.

Table 14: Regression results for during of equity overvaluation and managers' choices of using alternative earnings management (H6)

Table 14 Panel A: the regression results for H6 with AM _{j,t} and UE _{j,t} as dependent variables								
	Model 21 with AM _{j,t} as dependent variable				Model 22 with UE _{j,t} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
Over _{0j,t}	0.455 [*]	0.233	1.950	0.052	0.469	0.461	1.020	0.309
Over _{1j,t}	-0.081	0.237	-0.340	0.733	0.985 ^{**}	0.499	1.970	0.048
Over _{2j,t}	-0.100	0.219	-0.460	0.648	2.748 ^{***}	0.647	4.240	0.000
Over _{3j,t}	-0.128	0.210	-0.610	0.543	0.517	0.418	1.240	0.216
AM specific								
Big4 _{j,t}	-0.084	0.254	-0.330	0.742				
Litigation _{j,t}	0.434	0.371	1.170	0.242				
UE specific								
Meet _{j,t}					0.122	0.261	0.470	0.641
Loss _{j,t}					1.350 ^{***}	0.454	2.980	0.003
General controls								
UE _{j,t}	-0.305 ^{**}	0.122	-2.490	0.013				
AM _{j,t}					-0.614 ^{***}	0.218	-2.820	0.005
Leverage _{j,t}	0.827 ^{***}	0.207	4.010	0.000	1.345 ^{**}	0.637	2.110	0.035
SalesG _{j,t}	-0.515 ^{**}	0.230	-2.240	0.026	-1.216 ^{**}	0.499	-2.440	0.015
MtoB _{j,t}	0.019	0.085	0.220	0.827	-0.659 ^{***}	0.188	-3.500	0.000
Mktcap _{j,t}	-0.065	0.045	-1.440	0.151	0.468 ^{***}	0.093	5.020	0.000
NOA _{j,t}	-0.053	0.088	-0.600	0.547	0.310	0.261	1.190	0.234
ROE _{j,t}	0.101	0.485	0.210	0.835	2.242 ^{**}	1.085	2.070	0.039
Capital _{j,t}	-0.182	0.121	-1.500	0.133	0.394	0.264	1.490	0.135
_cons	1.320 ^{**}	0.550	2.400	0.017	-4.494 ^{***}	1.144	-3.930	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	469				469			
R-squared	9.77%			Pseudo R-squared	19.64%			

* p<0.10, ** p<0.05, *** p<0.01

Table 14: Regression results for equity overvaluation and alternative earnings management (H6) (continued)

Table 14 Panel B: the regression results for H6 with InAM_{j,t} and InEx_{j,t} as dependent variables

	Model 23 with InAM _{j,t} as dependent variable				Model 24 with InEx _{j,t} as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
Over _{0j,t}	0.927 [*]	0.486	1.910	0.056	0.291	0.499	0.580	0.559
Over _{1j,t}	-0.340	0.434	-0.780	0.433	0.848 [*]	0.460	1.840	0.065
Over _{2j,t}	-1.169 ^{**}	0.458	-2.550	0.011	2.444 ^{***}	0.487	5.020	0.000
Over _{3j,t}	-0.788 ^{**}	0.402	-1.960	0.050	0.740 [*]	0.428	1.730	0.084
AM specific								
Big4 _{j,t}	-1.069 ^{**}	0.495	-2.160	0.031				
Litigation _{j,t}	0.822	0.723	1.140	0.256				
UE specific								
Meet _{j,t}					-0.024	0.254	-0.090	0.925
Loss _{j,t}					1.863 ^{***}	0.403	4.630	0.000
General controls								
InEx _{j,t}	-0.560 ^{**}	0.223	-2.520	0.012				
InAM _{j,t}					-0.626 ^{***}	0.229	-2.730	0.006
Leverage _{j,t}	0.315	0.402	0.780	0.434	0.961 [*]	0.523	1.840	0.066
SalesG _{j,t}	-0.227	0.439	-0.520	0.605	-0.662	0.496	-1.330	0.182
MtoB _{j,t}	-0.259	0.159	-1.620	0.104	-0.578 ^{***}	0.166	-3.490	0.000
Mktcap _{j,t}	0.068	0.082	0.830	0.405	0.305 ^{***}	0.088	3.460	0.001
NOA _{j,t}	0.071	0.164	0.430	0.665	0.264	0.206	1.280	0.200
ROE _{j,t}	1.755 [*]	0.939	1.870	0.061	1.652 [*]	0.934	1.770	0.077
Capital _{j,t}	-0.468 [*]	0.243	-1.930	0.054	0.823 ^{***}	0.254	3.230	0.001
_cons	1.719	1.061	1.620	0.105	-4.873 ^{***}	1.113	-4.380	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	469				469			
Pseudo R-squared	10.93%				17.83%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.5.3.3 Results for limited ability using accruals earnings management (H7)

To test H7 where overvalued firms have limited abilities to manipulate earnings using accruals they only engage in opportunistic underlying earnings reporting, this paper examines the subset sample which only includes the sample in the upper median of $NOA_{j,t}$ ²⁵. Table 15 panel A shows the results of H7 by using the year industry regression models with $AM_{j,t}$ and $UE_{j,t}$ as the dependent variables. Model 25 is tested using the year industry fixed-effects panel model with $AM_{j,t}$ as the dependent variable and model 26 is tested using the year industry fixed-effects logit model with $UE_{j,t}$ as the dependent variable. Table 15 panel B shows the results of H7 using the year industry fixed-effects logit regression models with $InAM_{j,t}$ (model 27) and $InEx_{j,t}$ (model 28) as dependent variables. By confirming the H7 prediction, this paper finds that firms with limited accruals earnings management options do not engage in accruals earnings management, and as the duration of overvaluation increases, they engage in underlying earnings disclosures and report them opportunistically to maintain overvaluation. Specifically, none of overvaluation measures are significantly related to $AM_{j,t}$, while the coefficients on $Over_{1j,t}$ and $Over_{2j,t}$ are significantly and positively associated with $UE_{j,t}$ (coefficient=1.260, p-value=0.063) and (coefficient=4.280, p-value=0.002) respectively, as found in model 26. Model 27 finds that $Over_{2j,t}$ is significantly and negatively associated with $InAM_{j,t}$ (coefficient=-2.344, p-value=0.012), while model 28 finds that a positive $Over_{2j,t}$ is related to $InEx_{j,t}$ (coefficient=3.290, p-value=0.000). The results of table 15 suggest that if accruals-constrained firms find it hard to apply accruals earnings management, they only disclose underlying earnings and disclose them opportunistically to sustain the overvaluation.

²⁵ Each year is ranked on $NOA_{j,t}$ and then the upper median of $NOA_{j,t}$ for each year is selected as a proxy of accruals constrains firms.

Table 15: Regression results for limited ability of using accruals earnings management (H7)

Table 15 Panel A: the regression results for H7 with AM_{j,t} and UE_{j,t} as dependent variables

	Model 25 with AM _{j,t} as dependent variable				Model 26 with UE _{j,t} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
Over _{0j,t}	-0.216	0.229	-0.940	0.347	0.603	0.765	0.790	0.431
Over _{1j,t}	-0.121	0.186	-0.650	0.516	1.260 [*]	0.677	1.860	0.063
Over _{2j,t}	-0.082	0.224	-0.370	0.713	4.280 ^{***}	1.399	3.060	0.002
Over _{3j,t}	-0.189	0.199	-0.950	0.343	1.085	0.691	1.570	0.116
AM specific								
Big4 _{j,t}	-1.127 ^{***}	0.270	-4.180	0.000				
Litigation _{j,t}	0.374	0.310	1.210	0.229				
UE specific								
Meet _{j,t}					-0.092	0.398	-0.230	0.818
Loss _{j,t}					2.655 ^{***}	0.902	2.940	0.003
General controls								
UE _{j,t}	-0.077	0.110	-0.700	0.485				
AM _{j,t}					-0.498	0.403	-1.240	0.217
Leverage _{j,t}	0.044	0.157	0.280	0.780	1.213	1.177	1.030	0.303
SalesG _{j,t}	-0.655 ^{***}	0.226	-2.890	0.004	-1.093	0.889	-1.230	0.219
MtoB _{j,t}	0.081	0.076	1.080	0.283	-1.113 ^{***}	0.339	-3.280	0.001
Mktcap _{j,t}	-0.107 ^{**}	0.043	-2.490	0.013	0.632 ^{***}	0.158	3.990	0.000
ROE _{j,t}	-0.560	0.622	-0.900	0.368	2.598	2.502	1.040	0.299
Capital _{j,t}	-0.114	0.109	-1.050	0.293	0.707	0.432	1.640	0.102
_cons	2.543 ^{***}	0.540	4.710	0.000	1.213	1.177	1.030	0.303
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	242				242			
R-squared	18.06%			Pseudo R-squared	26.53%			

^{*} $p < 0.10$, ^{**} $p < 0.05$, ^{***} $p < 0.01$

Table 15: Regression results for limited ability of using Accruals earnings management (H7) (continued)

Table 15 Panel B: the regression results for H7 with $\ln AM_{j,t}$ and $\ln EX_{j,t}$ as dependent variables

	Model 27 with $\ln AM_{j,t}$ as dependent variable				Model 28 with $\ln EX_{j,t}$ as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	0.784	0.739	1.060	0.289	1.086	0.797	1.360	0.173
$Over_{1j,t}$	-0.237	0.559	-0.420	0.672	0.927	0.627	1.480	0.139
$Over_{2j,t}$	-2.344 ^{**}	0.937	-2.500	0.012	3.290 ^{***}	0.886	3.720	0.000
$Over_{3j,t}$	-0.568	0.631	-0.900	0.368	0.760	0.702	1.080	0.279
AM specific								
$Big4_{j,t}$	-1.012	0.866	-1.170	0.243				
$Litigation_{j,t}$	2.154 [*]	1.114	1.930	0.053				
UE specific								
$Meet_{j,t}$					0.324	0.390	0.830	0.405
$Loss_{j,t}$					3.253 ^{***}	0.795	4.090	0.000
General controls								
$\ln EX_{j,t}$	-0.725 ^{**}	0.320	-2.260	0.024				
$\ln AM_{j,t}$					-0.449	0.339	-1.320	0.186
$Leverage_{j,t}$	1.007	0.978	1.030	0.303	1.012	1.017	0.990	0.320
$SalesG_{j,t}$	-0.604	0.772	-0.780	0.434	0.180	0.849	0.210	0.832
$MtoB_{j,t}$	0.049	0.231	0.210	0.831	-0.820 ^{***}	0.250	-3.270	0.001
$Mktcap_{j,t}$	-0.020	0.127	-0.160	0.875	0.480 ^{***}	0.147	3.260	0.001
$ROE_{j,t}$	-0.786	1.950	-0.400	0.687	-0.347	2.104	-0.160	0.869
$Capital_{j,t}$	-0.510	0.371	-1.370	0.169	1.222 ^{***}	0.414	2.950	0.003
_cons.	2.490	1.741	1.430	0.153	-6.600 ^{***}	1.798	-3.670	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs	242				242			
Pseudo R-squared	13.25%				25.71%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.6 Additional tests

3.6.1 Alternative measurement of equity overvaluation

The proxies for equity valuation used in this paper are based on a simple but powerful representation of the relation between stock price and accounting fundamentals (Habib et al., 2013). To prove the main results of H6, this paper uses another more precise measurement of equity overvaluation. Jensen (2005) stated that a firm is overvalued when ‘a firm’s stock price is greater than its underlying value,’ i.e., it occurs when the ratio of stock price to underlying value exceeds 1. Following Badertscher (2011), this paper uses the Edwards & Bell (1961) and Ohlson (1995) (EBO) residual income approach to get an alternative overvaluation measure.

The EBP model can be empirically estimated as follows:

$$V_{j,t} = B_{j,t} + \frac{(FROE_{j,t} - r_{PEG})}{(1 + r_{PEG})} B_{j,t} + \frac{(FROE_{j,t+1} - r_{PEG})}{(1 + r_{PEG})^2} B_{j,t+1} + \frac{(FROE_{j,t+2} - r_{PEG})}{(1 + r_{PEG})^2 r_{PEG}} B_{j,t+2} \quad (11)$$

Where: j is firm observations. t is years from 2009 to 2012. $V_{j,t}$ represents a j firm’s intrinsic value in year t . $B_{j,t}$ is the book value and FROE is the future return on equity. Since the year-end book value depends on current-year return on equity (ROE), this paper uses a sequential process to estimate future ROEs. The cost of equity (r_{PEG}) is measured by the PEG ratio method. This paper uses the implied cost of equity model to measure the cost of equity for listed firms where the implied cost of equity is a discount rate that equates current share prices to expected future payoffs. There are many empirical studies that apply implied cost of equity methods to calculate the cost of equity (Li et al., 2014; Easton, 2004; Gode & Mohanram, 2003; Gebhardt et al., 2001). Although different models use various approaches and assumptions for valuation, they are all based on estimating the current share prices and future earnings. Of the various models, Easton’s (2004) model is considered to be superior to

the others because the evaluation of expected return is more predictably and consistently associated with risk proxies such as size, beta, residual risk, leverage and growth (Li et al., 2014; Botosan & Plumlee, 2005). Therefore, Easton's (2004) model is used in this thesis, and is represented in equation (12). PEG is the price-earnings-growth ratio (PEG ratio), which is calculated by equation (13):

$$\text{Cost of Equity} = \sqrt{\frac{1}{\text{PEG} \times 100}} \quad (12), \text{ where PEG} = (\text{P/E Ratio})/(\text{Annual EPS Growth}) \quad (13)$$

The equity valuation is measured by P/V (price-to-value) ratios, which is calculated by dividing the stock price (P) by a firm's intrinsic value (V). The P/V ratio is a good predictor of cross-sectional returns because P/V predicts cross-sectional returns and the book-to-market ratio (Frankel & Lee, 1998; Badertscher, 2011). To identify overvalued firms and measure the duration of overvaluation, each year's P/V ratios of firms are ranked. Firms in the top quartile of P/V ratios are recorded as 1 to represent overvalued firms, and 0 otherwise. $\text{Over}_{0j,t}$ equals 1 if j firm is in the top quartile of P/V ratios once during the sample years from 2009 to 2012, and 0 otherwise. $\text{Over}_{1j,t}$ equals 1 if j firm is in the top quartile of P/V ratios for one consecutive year during the sample years, and 0 otherwise. $\text{Over}_{2j,t}$ equals 1 if j firm is in the top quartile of P/V ratios for two consecutive years during the sample years, and 0 otherwise. $\text{Over}_{3j,t}$ equals 1 if j firm is in the top quartile of P/V ratios for three consecutive years during the sample years, and 0 otherwise.

Table 16 presents the results of alternative overvaluation measures. Panel A of table 16 shows the results of H6 with $\text{AM}_{j,t}$ (model 29) and $\text{UE}_{j,t}$ (model 30) as dependent variables using the year industry fixed-effects regressions. Model 29 presents the results using the year industry fixed-effects panel regression with $\text{AM}_{j,t}$ as dependent variable, while model 30 shows the results using the year industry fixed-effects logit regression with $\text{UE}_{j,t}$ as dependent

variable. Panel B of table 16 presents the results of H6 with $\ln AM_{j,t}$ (model 31) and $\ln Ex_{j,t}$ (model 32) as dependent variables using the year industry fixed-effects logit regressions. These results are generally similar to the main results, but are not as significant. Model 29 presents that none of the four overvaluation measures are significantly related to $AM_{j,t}$. $Over_{3j,t}$ is weakly and significantly and positively related to $UE_{j,t}$ (coefficient=1.544, p-value=0.098) as found in model 30. The results of model 31 shows that $Over_{3j,t}$ is weakly significant and negatively related to $\ln AM$ (coefficient=-1.947, p-value=0.096), while model 32 finds that the $Over_{1j,t}$ and $Over_{3j,t}$ are significantly and positively related to $\ln Ex_{j,t}$ (coefficient=1.413, p-value=0.033) and (coefficient=1.750, p-value=0.037), respectively. Although this method is better at measuring equity overvaluation, it reduces the sample size from 469 to 269. The small sample size would be the reason for the weakened relationships.

Table 16: Regression results for using alternative overvaluation measure (H6)Table 16 Panel A: the regression results for H6 using alternative overvaluation measurement with $AM_{j,t}$ and $UE_{j,t}$ as dependent variables

	Model 29 with $AM_{j,t}$ as dependent variable				Model 30 with $UE_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	-0.155	0.158	-0.980	0.327	0.617	0.377	1.630	0.102
$Over_{1j,t}$	-0.165	0.270	-0.610	0.541	0.601	0.640	0.940	0.348
$Over_{2j,t}$	-0.366	0.407	-0.900	0.370	-0.100	0.986	-0.100	0.920
$Over_{3j,t}$	-0.248	0.370	-0.670	0.504	1.544*	0.932	1.660	0.098
AM specific								
$Big4_{j,t}$	-0.178	0.247	-0.720	0.473				
$Litigation_{j,t}$	0.458	0.431	1.060	0.290				
UE specific								
$Meet_{j,t}$					0.296	0.506	0.590	0.558
$Loss_{j,t}$					0.302	0.644	0.470	0.639
General controls								
$UE_{j,t}$	-0.260*	0.135	-1.930	0.055				
$AM_{j,t}$					-0.683**	0.302	-2.260	0.024
$Leverage_{j,t}$	1.212***	0.268	4.530	0.000	0.073	0.757	0.100	0.923
$SalesG_{j,t}$	-0.529**	0.235	-2.260	0.025	-0.298	0.593	-0.500	0.615
$MtoB_{j,t}$	0.096	0.085	1.130	0.258	-0.644**	0.271	-2.380	0.017
$Mktcap_{j,t}$	-0.043	0.047	-0.920	0.357	0.643***	0.135	4.780	0.000
$NOA_{j,t}$	0.121	0.097	1.260	0.209	0.304	0.256	1.180	0.236
$ROE_{j,t}$	0.342	0.348	0.980	0.327	2.359*	1.353	1.740	0.081
$Capital_{j,t}$	-0.128	0.103	-1.240	0.215	0.285	0.303	0.940	0.346
_cons	0.714	0.458	1.560	0.121	-5.486***	1.574	-3.480	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	269				269			
R-squared	20.32%			Pseudo R-squared	21.18%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Regression results for using alternative overvaluation measure (H6)
(continued)

Table 16 Panel B: the regression results for H6 using alternative overvaluation measurement with $\ln AM_{j,t}$ and $\ln EX_{j,t}$ as dependent variables								
	Model 31 with $\ln AM_{j,t}$ as dependent variable				Model 32 with $\ln EX_{j,t}$ as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	-0.544	0.354	-1.530	0.125	-0.083	0.387	-0.220	0.830
$Over_{1j,t}$	-0.352	0.594	-0.590	0.553	1.413**	0.662	2.140	0.033
$Over_{2j,t}$	-0.320	0.884	-0.360	0.718	1.355	1.077	1.260	0.208
$Over_{3j,t}$	-1.947*	1.168	-1.670	0.096	1.750**	0.840	2.080	0.037
AM specific								
$Big4_{j,t}$	-0.297	0.559	-0.530	0.596				
$Litigation_{j,t}$	0.080	1.014	0.080	0.937				
UE specific								
$Meet_{j,t}$					-0.132	0.495	-0.270	0.790
$Loss_{j,t}$					0.647	0.624	1.040	0.300
General controls								
$\ln EX_{j,t}$	-0.757**	0.322	-2.350	0.019				
$\ln AM_{j,t}$					-0.780**	0.316	-2.470	0.014
$Leverage_{j,t}$	-0.102	0.593	-0.170	0.863	-0.868	0.912	-0.950	0.341
$SalesG_{j,t}$	0.468	0.531	0.880	0.378	-0.271	0.623	-0.430	0.664
$MtoB_{j,t}$	-0.326	0.218	-1.500	0.134	-0.554**	0.249	-2.230	0.026
$Mktcap_{j,t}$	0.116	0.102	1.140	0.255	0.223*	0.116	1.920	0.055
$NOA_{j,t}$	0.187	0.223	0.840	0.402	0.257	0.238	1.080	0.280
$ROE_{j,t}$	1.882*	1.110	1.700	0.090	0.519	1.468	0.350	0.724
$Capital_{j,t}$	-0.180	0.248	-0.730	0.468	0.399	0.289	1.380	0.167
_cons	-0.396	1.029	-0.380	0.701	-2.957**	1.408	-2.100	0.036
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	269				269			
Pseudo R-squared	10.31%				14.24%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Equity overvaluation is measured by dummy variable which equals one if firms in the top quartile of P/V ratios, zero, otherwise.

3.6.2 Alternative accruals earnings management measurements

This section considers two other proxies for accruals earnings management; one is measured using the same method with Dechow & Dichev's (2002) model, while the residuals of Equation (7)- $AQ_{j,t}$ is measured by rolling a 10-year window standard deviation rather than a rolling 5-year window standard deviation. The second proxy for accruals earnings management is measured by the modified Jones model, modified by Dechow et al. (1995). Table 17 presents the pearson and spearman correlations for the different accruals earnings management measurements. $AM_{j,t}$, $AM_{10j,t}$, and $MJ_{j,t}$ are positively and significantly correlated to each other. Moreover, $InAM_{j,t}$, $InAM_{10j,t}$, and $InMJ_{j,t}$ are also positively and significantly correlated to each other, which suggests that the accruals earnings management measurements for the main tests are robust.

Table 17: Pearson and spearman correlations for accruals earnings management variables

	$AM_{j,t}$	$AM_{10j,t}$	$MJ_{j,t}$	$InAM_{j,t}$	$InAM_{10j,t}$	$InMJ_{j,t}$
$AM_{j,t}$	1.000	0.841*** (0.000)	0.271*** (0.000)	0.077* (0.067)	0.047 (0.273)	-0.031 (0.467)
$AM_{10j,t}$	0.289*** (0.000)	1.000	0.211*** (0.000)	0.048 (0.260)	0.070 (0.106)	0.040 (0.354)
$MJ_{j,t}$	0.154*** (0.000)	0.110** (0.012)	1.000	0.151*** (0.000)	0.173*** (0.000)	-0.040 (0.349)
$InAM_{j,t}$	-0.084* (0.055)	-0.040 (0.367)	0.131*** (0.003)	1.000	0.211*** (0.000)	0.140*** (0.001)
$InAM_{10j,t}$	-0.007 (0.879)	-0.059 (0.177)	0.175*** (0.000)	0.213*** (0.000)	1.000	0.082* (0.061)
$InMJ_{j,t}$	0.015 (0.737)	0.038 (0.387)	0.031 (0.477)	0.122*** (0.005)	0.083* (0.057)	1.000

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Pearson (above) and spearman (bellow) correlations Note: $AM_{10j,t}$ is absolute 'abnormal' accruals ($(e_{j,t})$ of Equation (8) where $AQ_{j,t}$ is measured using 10 year-rolling window of residuals ($v_{j,t}$) of Equation (7) for firm j, year t. $InAM_{10j,t}$ is positive of 'abnormal' accruals (the positive residuals ($e_{j,t}$) of Equation (8)), which represents income-increasing accruals earnings management for firm j, in year t. $MJ_{j,t}$ is absolute values of residuals ($\epsilon_{j,t}$) of Equation (14) representing the discretionary accruals earnings management for firm j, in year t and $InMJ_{j,t}$ is dummy variable that the positive values of residuals ($\epsilon_{j,t}$) is coded as '1' representing the income-increasing accruals earnings management for firm j, in year t, '0' otherwise.

3.6.2.1 Dechow & Dichev's (2002) model with a 10-year rolling window

To eliminate concerns about whether the periods of rolling years would influence the measurement of accruals earnings management, this paper re-measures accruals quality using Dechow & Dichev's (2002) model with 10-years rolling window standard deviations; and table 18 presents the results of these measurements. Since this paper only includes positive P/E ratios and positive P/B ratios and accruals earnings management needs 10-years of rolling window data, it leads to decrease in sample size to 452 firm-year observations. Panel A of table 18 shows the results of H6 with $AM_{10j,t}$ (model 33) and $UE_{j,t}$ (model 34) as dependent variables using the year industry fixed-effects regressions. Model 33 is tested using the year industry fixed-effects panel model with $AM_{10j,t}$ as the dependent variable, while model 34 is measured by the year industry fixed-effects logit model with $UE_{j,t}$ as the dependent variable. Panel B of table 18 presents the results of H6 with $InAM_{10j,t}$ (model 35) and $InEx_{j,t}$ (model 36) as dependent variables using the year industry fixed-effects logit regressions. The results are similar to the main results, providing evidence that $Over_{0j,t}$ is significantly and positively associated with $AM_{10j,t}$ (coefficient=0.062, p-value=0.040), while $Over_{2j,t}$ is significantly and positively related to $UE_{j,t}$ (coefficient=2.514, p-value=0.000). By looking at the income-increasing earnings management mechanism, $Over_{0j,t}$ is significantly and positively associated with $InAM_{10j,t}$ (coefficient=2.965, p-value=0.000), while $Over_{1j,t}$, $Over_{2j,t}$, and $Over_{3j,t}$ are significantly and positively related to $InEx_{j,t}$ (coefficient=0.957, p-value=0.038), (coefficient=2.372, p-value=0.000), and (coefficient=0.858, p-value=0.049), respectively. These results suggest that overvalued firms use accruals earnings management once at an early stage of overvaluation, and then disclose underlying earnings and engage in opportunistic underlying earnings reporting to sustain the overvaluation.

Table 18: Regression results for using 10 year-rolling window of Dechow & Dichev's (2002) model (H6)

Table 18 Panel A: the regression results for H6 using 10 year-rolling window of DD's model with $AM_{10j,t}$ and $UE_{j,t}$ as dependent variables								
	Model 33 with $AM_{10j,t}$ as dependent variable				Model 34 with $UE_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$Over_{0j,t}$	0.062**	0.030	2.060	0.040	0.112	0.477	0.240	0.814
$Over_{1j,t}$	-0.022	0.030	-0.740	0.461	0.801	0.497	1.610	0.107
$Over_{2j,t}$	-0.020	0.028	-0.720	0.472	2.514***	0.629	4.000	0.000
$Over_{3j,t}$	-0.005	0.027	-0.190	0.846	0.483	0.429	1.130	0.260
AM specific								
$Big4_{j,t}$	-0.038	0.033	-1.140	0.254				
$Litigation_{j,t}$	0.021	0.049	0.440	0.662				
UE specific								
$Meet_{j,t}$					0.154	0.265	0.580	0.563
$Loss_{j,t}$					1.297***	0.457	2.840	0.005
General controls								
$UE_{j,t}$	-0.031**	0.016	-1.990	0.047				
$AM_{10j,t}$					-6.154***	2.047	-3.010	0.003
$Leverage_{j,t}$	0.100***	0.026	3.790	0.000	1.330**	0.644	2.070	0.039
$SalesG_{j,t}$	-0.044	0.030	-1.500	0.136	-1.184**	0.517	-2.290	0.022
$MtoB_{j,t}$	0.006	0.011	0.550	0.580	-0.678***	0.202	-3.350	0.001
$Mktcap_{j,t}$	-0.017***	0.006	-2.900	0.004	0.378***	0.096	3.920	0.000
$NOA_{j,t}$	-0.003	0.011	-0.250	0.803	0.461*	0.273	1.690	0.091
$ROE_{j,t}$	-0.043	0.063	-0.680	0.495	2.156*	1.145	1.880	0.060
$Capital_{j,t}$	-0.030*	0.016	-1.860	0.063	0.299	0.275	1.090	0.277
_cons	0.277***	0.071	3.890	0.000	-3.619***	1.190	-3.040	0.002
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	452				452			
R-squared	12.05%			Pseudo R-squared	19.29%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 18: Regression results for using 10 year-rolling window of Dechow & Dichev's (2002) model (H6) (continued)

Table 18 Panel B: the regression results for H6 using 10 year-rolling window of DD's model with $\ln AM_{10j,t}$ and $\ln Ex_{j,t}$ as dependent variables								
	Model 35 with $\ln AM_{10j,t}$ as dependent variable				Model 36 with $\ln Ex_{j,t}$ as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	2.965 ^{***}	0.543	5.460	0.000	0.526	0.547	0.960	0.336
$Over_{1j,t}$	0.146	0.542	0.270	0.787	0.957 ^{**}	0.461	2.080	0.038
$Over_{2j,t}$	-0.481	0.690	-0.700	0.486	2.372 ^{***}	0.492	4.820	0.000
$Over_{3j,t}$	0.688	0.477	1.440	0.149	0.858 ^{**}	0.436	1.970	0.049
AM specific								
$Big4_{j,t}$	-0.786	0.536	-1.470	0.143				
$Litigation_{j,t}$	-2.393 ^{**}	1.002	-2.390	0.017				
UE specific								
$Meet_{j,t}$					0.032	0.261	0.120	0.901
$Loss_{j,t}$					1.891 ^{***}	0.428	4.420	0.000
General controls								
$\ln Ex_{j,t}$	-1.093 ^{***}	0.288	-3.800	0.000				
$\ln AM_{10j,t}$					-1.106 ^{***}	0.289	-3.820	0.000
$Leverage_{j,t}$	-0.779	0.732	-1.060	0.287	0.858	0.541	1.590	0.113
$SalesG_{j,t}$	-0.113	0.550	-0.210	0.837	-0.675	0.501	-1.350	0.178
$MtoB_{j,t}$	-0.300	0.204	-1.470	0.141	-0.564 ^{***}	0.171	-3.290	0.001
$Mktcap_{j,t}$	0.502 ^{***}	0.103	4.890	0.000	0.361 ^{***}	0.092	3.930	0.000
$NOA_{j,t}$	-0.242	0.248	-0.980	0.329	0.216	0.220	0.980	0.326
$ROE_{j,t}$	1.076	1.081	1.000	0.319	1.269	0.943	1.350	0.178
$Capital_{j,t}$	0.400	0.287	1.400	0.163	0.924 ^{***}	0.260	3.550	0.000
_cons	-4.102 ^{***}	1.233	-3.330	0.001	-5.398 ^{***}	1.140	-4.740	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	452				452			
Pseudo R-squared	19.35%				19.31%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: DD represents Dechow & Dichev. $Over_{j,t}$ is dummy variable which equals 1 if j firm is in the top quartile of $PBPE_{j,t}$ in year t, 0 otherwise. $Over_{0j,t}$ equals 1 if j firm is overvalued once during the sample years from 2009 to 2012, and 0 otherwise. $Over_{1j,t}$ equals 1 if j firm is overvalued one consecutive year during the sample years, and 0 otherwise. $Over_{2j,t}$ equals 1 if j firm is overvalued two consecutive years during the sample years, and 0 otherwise. $Over_{3j,t}$ equals 1 if j firm is overvalued three consecutive years during the sample years, and 0 otherwise. $AM_{10j,t}$ is absolute 'abnormal' accruals ($(e_{j,t})$ of Equation (8) where $AQ_{j,t}$ is measured using 10 year-rolling window of residuals ($v_{j,t}$) of Equation (7) for firm j, year t. $\ln AM_{10j,t}$ is positive of 'abnormal' accruals (the positive residuals ($e_{j,t}$) of Equation (8)), which represents income-increasing accruals earnings management for firm j, in year t.

3.6.2.2 Modified Jones model

In this section, this paper re-examines accruals earnings management using modified Jones model (Dechow et al., 1995) which is the widely used in the earnings management literature (Dechow et al., 2010). By applying the modified Jones model, accruals quality is associated with the extent to which accruals are captured by fitted values by regressing total accruals on changes in revenues and PPE. This paper uses a modified Jones model (modified by Dechow et al., 1995) to re-test H6. The modified Jones model is presented as shown below:

$$\frac{TACC_{j,t}}{A_{j,t-1}} = \beta_1 \frac{1}{A_{j,t-1}} + \beta_2 \frac{(\Delta S_{j,t} - \Delta AR_{j,t})}{A_{j,t-1}} + \beta_3 \frac{PPE_{j,t}}{A_{j,t-1}} + \varepsilon_{j,t} \quad (14)$$

Where: j is firm observations. t is years from 2009 to 2012. $A_{j,t-1}$ equals the total assets for firm j , in year $t-1$. $\Delta S_{j,t}$ equals the net sales for firm j in year t minus net sales for firm j in year $t-1$. $TACC_{j,t}$ is the total accruals for firm j , in year in t , which is measured by earnings before tax for firm j , year t minus operating cash flows for firm j , year t . $\Delta AR_{j,t}$ equals the change in accounts receivable from year $t-1$ to t , for firm j , and $PPE_{j,t}$ equals the value of property, plant, and equipment for firm j , in year t . The cross-sectional residuals of Equation (14)— $\varepsilon_{j,t}$ are used to calculate accruals earnings management. $MJ_{j,t}$ is the absolute values of residuals ($\varepsilon_{j,t}$) representing the discretionary accruals earnings management, and $InMJ_{j,t}$ is a dummy variable that the positive values of residuals ($\varepsilon_{j,t}$) are coded as ‘1’ to represent the income-increasing accruals earnings management, and ‘0’ otherwise.

Table 19 presents the results of re-measuring the accruals earnings management using the modified Jones model. Panel A of table 19 shows the results of H6 with $MJ_{j,t}$ (model 37) and $UE_{j,t}$ (model 38) as dependent variables using the year industry fixed-effects regressions. Model 37 is tested using the year industry fixed-effects panel model with $MJ_{j,t}$ as the dependent variable, while model 38 is measured by the year industry fixed-effects logit model with $UE_{j,t}$ as the dependent variable. Panel B of table 19 presents the results of H6

with $\ln MJ_{j,t}$ (model 39) and $\ln Ex_{j,t}$ (model 40) as dependent variables using the year industry fixed-effects logit regressions. The results of panel A show that $MJ_{j,t}$ is significantly and positively related to $Over_{0j,t}$ (coefficient=0.065, p-value=0.000) and is weakly significant and positively associated with $Over_{1j,t}$ (coefficient=0.031, p-value=0.082), while both $Over_{1j,t}$ and $Over_{2j,t}$ are significantly positively associated with $UE_{j,t}$ (coefficient=1.050, p-value=0.033) and (coefficient=2.884, p-value=0.000), respectively. Turning to the income-increasing earnings mechanisms, the results of panel B show that $Over_{1j,t}$, $Over_{2j,t}$, and $Over_{3j,t}$ are significantly and negatively related to $\ln MJ_{j,t}$ (coefficient=-0.820, p-value=0.073), (coefficient=-2.090, p-value=0.000), and (coefficient=-0.734, p-value=0.077), respectively, while $Over_{1j,t}$ and $Over_{2j,t}$ are significantly and positively related to $\ln Ex_{j,t}$ (coefficient=0.783, p-value=0.090) and (coefficient=2.160, p-value=0.000), respectively. The results of the modified Jones model are similar to the main results which suggest that the duration of equity overvaluation is an important determinant of earnings management mechanism managers choose. The longer firms are overvalued the higher the likelihood that managers will disclose underlying earnings opportunistically.

Table 19: Regression results for using modified Jones model (H6)

Table 19 Panel A: the regression results for H6 using modified Jones model with $MJ_{j,t}$ and $UE_{j,t}$ as dependent variables

	Model 37 with $MJ_{j,t}$ as dependent variable				Model 38 with $UE_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	0.065***	0.018	3.670	0.000	0.699	0.473	1.480	0.139
$Over_{1j,t}$	0.031*	0.018	1.740	0.082	1.050**	0.491	2.140	0.033
$Over_{2j,t}$	0.020	0.016	1.230	0.220	2.884***	0.648	4.450	0.000
$Over_{3j,t}$	0.009	0.016	0.570	0.570	0.645	0.419	1.540	0.123
AM specific								
$Big4_{j,t}$	-0.086***	0.019	-4.540	0.000				
$Litigation_{j,t}$	0.030	0.029	1.060	0.288				
UE specific								
$Meet_{j,t}$					0.053	0.261	0.200	0.839
$Loss_{j,t}$					1.197***	0.438	2.730	0.006
General controls								
$UE_{j,t}$	-0.017*	0.009	-1.860	0.063				
$MJ_{j,t}$					-3.101**	1.298	-2.390	0.017
$Leverage_{j,t}$	0.028*	0.016	1.770	0.077	1.078*	0.581	1.860	0.064
$SalesG_{j,t}$	-0.018	0.017	-1.010	0.313	-1.150**	0.507	-2.270	0.023
$MtoB_{j,t}$	0.031***	0.006	4.950	0.000	-0.550***	0.191	-2.880	0.004
$Mktcap_{j,t}$	-0.001	0.003	-0.380	0.704	0.453***	0.093	4.870	0.000
$NOA_{j,t}$	-0.003	0.007	-0.440	0.659	0.289	0.243	1.190	0.233
$ROE_{j,t}$	-0.087***	0.036	-2.390	0.017	1.482	1.053	1.410	0.159
$Capital_{j,t}$	0.020**	0.009	2.220	0.027	0.493*	0.269	1.830	0.067
_cons	0.130***	0.041	3.170	0.002	-4.313***	1.149	-3.750	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	463 ²⁶				463			
R-squared	19.60%			Pseudo R-squared	18.68%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

²⁶ Since there are missing financial data for calculating modified Jones model, the sample size is reduced to 463 firm-year observations.

Table 19: Regression results for using modified Jones model (H6) (continued)Table 19 Panel B: the regression results for H6 using modified Jones model with $\ln MJ_{j,t}$ and $\ln Ex_{j,t}$ as dependent variables

	Model 39 with $\ln MJ_{j,t}$ as dependent variable				Model 40 with $\ln Ex_{j,t}$ as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
$Over_{0j,t}$	0.289	0.449	0.640	0.519	0.269	0.503	0.530	0.593
$Over_{1j,t}$	-0.820*	0.457	-1.800	0.073	0.783*	0.462	1.690	0.090
$Over_{2j,t}$	-2.090***	0.547	-3.820	0.000	2.160***	0.489	4.420	0.000
$Over_{3j,t}$	-0.734*	0.416	-1.770	0.077	0.686	0.431	1.590	0.111
AM specific								
$Big4_{j,t}$	0.129	0.490	0.260	0.792				
$Litigation_{j,t}$	-1.295	0.808	-1.600	0.109				
UE specific								
$Meet_{j,t}$					0.023	0.256	0.090	0.927
$Loss_{j,t}$					1.945***	0.413	4.710	0.000
General controls								
$\ln Ex_{j,t}$	-0.733***	0.229	-3.200	0.001				
$\ln MJ_{j,t}$					-0.850***	0.240	-3.550	0.000
$Leverage_{j,t}$	-0.631	0.548	-1.150	0.249	0.928	0.581	1.600	0.110
$SalesG_{j,t}$	-0.231	0.470	-0.490	0.623	-0.635	0.507	-1.250	0.211
$MtoB_{j,t}$	-0.359**	0.170	-2.110	0.035	-0.608***	0.169	-3.610	0.000
$Mktcap_{j,t}$	0.129	0.085	1.510	0.130	0.307***	0.089	3.470	0.001
$NOA_{j,t}$	-0.092	0.162	-0.570	0.570	0.194	0.197	0.990	0.324
$ROE_{j,t}$	-0.802	1.055	-0.760	0.447	1.021	0.947	1.080	0.281
$Capital_{j,t}$	-0.647**	0.267	-2.420	0.015	0.751***	0.256	2.940	0.003
_cons	1.147	1.080	1.060	0.288	-4.493***	1.124	-4.000	0.000
Year effects	YES				YES			
Industry effects	YES				YES			
Number of obs.	463				463			
Pseudo R-squared	13.12%				18.61%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: $Over_{j,t}$ is dummy variable which equals 1 if j firm is in the top quartile of $PBPE_{j,t}$ in year t, 0 otherwise. $Over_{0j,t}$ equals 1 if j firm is overvalued once during the sample years from 2009 to 2012, and 0 otherwise. $Over_{1j,t}$ equals 1 if j firm is overvalued one consecutive year during the sample years, and 0 otherwise. $Over_{2j,t}$ equals 1 if j firm is overvalued two consecutive years during the sample years, and 0 otherwise. $Over_{3j,t}$ equals 1 if j firm is overvalued three consecutive years during the sample years, and 0 otherwise. $MJ_{j,t}$ is absolute values of residuals ($\varepsilon_{j,t}$) of Equation (14) representing the discretionary accruals earnings management for firm j, in year t and $\ln MJ_{j,t}$ is dummy variable that the positive values of residuals ($\varepsilon_{j,t}$) is coded as '1' representing the income-increasing accruals earnings management for firm j, in year t, '0' otherwise.

3.7 Summary of chapter three

According to Jensen's (2005) agency theory of overvalued equity, firms with overvalued equity have strong incentives to engage in different opportunistic earnings management mechanisms in order to sustain overvaluation. This paper attempts to examine whether overvalued firms engage in opportunistic earnings management and whether the duration of overvaluation influence manager's choice of using different earnings management mechanisms. This paper presents evidence that overvalued firms are more likely to disclose underlying earnings and report them opportunistically for the whole sample periods. Considering how the duration of overvalued equity influence managers' choices of earnings management, the results suggest that managers engage in accruals earnings management in the early stage of overvaluation, but at the later stage, firms are more likely to disclose underlying earnings opportunistically to sustain overvaluation. These results hold true even when using alternative equity overvaluation and accruals earnings management measurements. Furthermore, this paper finds that overvalued firms with accruals earnings management constraints do not engage in accruals earnings management, they only engage in opportunistic underlying earnings reporting to sustain the overvalued equity. Collectively, these results are consistent with Jensen's (2005) agency theory that the duration of equity overvaluation is an important determinant of managers' choosing to use alternative earnings management mechanisms.

CHAPTER FOUR Intellectual capital disclosure and opportunistic underlying earnings reporting

This paper is in preparation for publication. I, Yiru Yang, declare that this paper is wholly my own work unless otherwise referenced or acknowledged.

Yiru Yang

21 June 2016

4.1 Introduction

The rise of the ‘new economy’, which is driven by information and knowledge, has led to an increased interest in IC in recent decades (Stewart, 1997; Petty & Guthrie, 2000; Bontis, 2001). IC is used to determine a firms’ value (Stewart, 1997; Edvinsson & Malone, 1997; Sveiby, 1998; Lev & Feng, 2001; Guthrie, 2001; Tan et al., 2007) and it is generated by or developed from unique organisational designs, innovations, and human resources (Joshi et al., 2013). To this extent, accounting standards do not provide for a comprehensive measurement and identification of IC in firms, especially knowledge-based firms (Guthrie et al., 1999; Guthrie et al., 2006; Vafaei et al., 2011). Although IFRS provide financial information in order to provide comprehensive financial statements that enhance the comparability of financial reports²⁷, they have nonetheless adopted the conservative measurements of IC, as argued by Ahmed & Goodwin (2007), Goodwin et al. (2008a), and Goodwin et al. (2008b). These studies acknowledged that the book value of intangible assets in balance sheets lack relevance because intangible assets in the balance sheet are represented by only a fraction of IC as a whole (e.g., Edvinsson & Malone, 1997; Sveiby, 1997; Lev, 2001; Pulic, 2004; Kim & Taylor, 2014).

In this ‘new economy’ age, only firms that account for their IC can positively influence investment decisions and the value of firms in a knowledge economy (Holland, 2003; Cahill & Myers, 2000; Bukh et al., 2005; Bukh, 2003; Joshi et al., 2013). Firms that do not disclose IC actually generate information asymmetries and a lack of transparency (Aboody & Lev, 1998; Barth et al., 2001; Vafaei et al., 2011), so this deficiency in IC reporting means that financial reporting loses its relevance to some extent (Lev & Sougiannis, 1996; Amir & Lev,

²⁷ There are a few changes concerning IC in the financial statements after the adoption of IFRS. For example, IFRS 3 requires that goodwill is considered to be an asset with an indefinite lifespan, and would therefore not be eligible for amortization. Instead, the book value of goodwill is subjected to impairment testing at either the level of a cash generating unit (CGU) or a group of CGUs of the consolidated entity. Further, all ICs that do not meet the criteria of control, identifiability, and future economic benefits were to be derecognized as assets and expensed (Vafaei et al., 2011).

1996). Therefore, allowing for sufficient IC disclosure would enhance the value relevance of accounting numbers to investors (Beisland et al., 2008; Lev & Zarowin, 1999; Barth & Clinch, 1996; Groujer, 1993).

Based on resource-based theory and signalling theory, this paper attempts to examine whether disclosed IC, which is treated as the inimitable and non-substitutable resources of a firm, can reflect their current and future financial performance and whether signals of such valuable resources to investors are relevant for evaluating a firm. Moreover, papers one (i.e., chapter two) and two (i.e., chapter three) of this thesis found that opportunistic underlying earnings reporting, as an earnings management tool, is used by managers to influence investors' perceptions of firm performance and to maintain equity overvaluation, but even so, this earnings management tool is rarely detected by investors. This paper attempts to examine whether firms who practice earnings management have difficulty disclosing the inimitable IC. The reasoning behind this is that high quality firms are more likely to disclose IC because it represents the inimitable and non-replaceable resources that enhances their performance, whereas low quality firms often find it difficult to disclose IC because it is hard to imitate. As a market valuation incentive, low quality firms are more likely use earnings management to influence investor's perceptions, so for this paper, earnings management is represented by opportunistic underlying earnings reporting.

The sample used for this study is based on 610 observations of ASX 200 listed firms from 2009 to 2012. Their financial performance shows that IC disclosure is positively related to a firm's current and future profitability and productivity. The result of value-relevant finds a significantly positive relationship between sufficient IC disclosure and the amount of future earnings reflected in current annual returns. These results confirm resource-based and signalling theory where IC disclosure reflects a firm's current and future financial

performance and also signals IC through annual reports that could bring future earnings to current stock returns on the basis that the markets react favourably to such reporting. Finally, this paper finds that IC disclosure and sufficient IC disclosure are negatively related to opportunistic underlying earnings management, thereby confirming that low quality firms are less likely to disclose IC and use opportunistic underlying earnings reporting to influence market perceptions. In the additional tests, this paper uses the traditional market valuation model to bolster the value-relevant results. The results show that IC disclosure and sufficient IC disclosure are positively related to the current and future market-to-book ratios, which confirms the main results that IC carries relevant information to the market, and also enhances the market value of firms. Furthermore, this paper investigates which particular category of IC (including internal capital, external capital, and human capital) is value-relevant to the market. The results showed that external capital can effectively carry current earnings information to the market, while human capital and internal capital can bring future earnings forward to the current stock returns, suggesting that the market perceives external capital disclosure to be value-relevant in order to reflect current earnings information, while human capital and internal capital are value-relevant in order to reflect a firm's future earnings. Finally, this paper finds that firms who practice opportunistic underlying earnings reporting rarely disclose external capital, internal capital and inimitable human capital.

The remainder of this paper is organised as follows: Section 4.2 examines the relevant literature; Section 4.3 explains the theoretical framework and development of hypotheses; Section 4.4 describes the research design; Section 4.5 presents analyses and results, including descriptive statistics, pearson and spearman correlations, and regressions results; Section 4.6 provides the additional tests, and Section 4.7 gives the conclusion.

4.2 Literature review

4.2.1 Definition of IC

Prior to the mid-1990s, scholars started raising the awareness of IC, especially those in Scandinavian and northern European academia (e.g., Brooking, 1996; Edvinsson & Malone, 1997; Stewart, 1997; Sveiby, 1997; Roos et al., 1998). At that time IC was recognised as being significant and therefore it should be measured and reported to create and manage the sustainable competitive advantages of firms (Guthrie et al., 2012), so in this growth, various terms, such as intangible resources, intangible assets, knowledge assets and intangibility, were used interchangeably to cover the concept of IC (Bontis, 2001; Kujansivu, 2005; Joshi et al., 2013).

In recent decades the term ‘IC’ is used as an instrument of value-creation, so interdisciplinary researchers investigated how the capital market reacted towards the potential for IC to create firm value (Murthy & Abeysekera, 2007; Mavridis, 2005; Dumay & Tull, 2007; Guthrie et al., 2012). Guthrie & Petty (2000c) suggest that IC is used as a foundation on which to create and use knowledge to enhance firm value, so IC essentially refers to the ability to translate organisational knowledge into value. Examples of this include the ability to forge and maintain positive relationships with customers, suppliers and other stakeholders and also innovate and implement new initiatives (Abeysekera, 2011 p.20).

In conclusion, IC underlines the importance of using the capital generated by humans and resources to generate products and services in a competitive manner (Phusavat et al., 2011), and this is reflected in strong firm performance and the creation of value (e.g., Lev, 2001; Curado, 2008, Guthrie et al., 2012, De Silva et al., 2014; Goebel, 2015).

4.2.2 Measurement of IC

Despite the increasing recognition of IC in driving their competitive advantage and value, an appropriate measure of firms' IC is still in infancy (Ming-Chin et al., 2005). Indeed, measuring IC is problematic because it is difficult to capture from corporate reporting (Petty & Guthrie, 2000; Guthrie et al., 2012). The first attempts at measuring IC are found in consulting practices in the late eighties (Sveiby, 1988), and it was only in the mid-1990s that research on IC began to develop in academic literature (Kaplan & Norton, 1992; Nonaka & Takeuchi 1995; Stewart, 1997; Edvinsson & Malone, 1997).

Sveiby (2010) reviewed fifties of IC literature and classified 42 models of IC into four categories that are an extension of the classifications suggested by Luthy (1998); they are: (a) the direct intellectual capital (DIC) measurement, (b) the market-based measurement (MCM), (c) the return on assets (ROA) measurement, (d) the scorecard (SC) measurement. Chan (2009a) and Sveiby (2010) however, argued that the 'Value Added Intellectual Coefficient' (VAICTM) methodology does not quite fit any of the four categories, so this paper modified Sveiby's (2010) classifications into four categories where the direct intellectual capital (DIC) measurement and the scorecard (SC) measurement is combined into one category called components-based (COB) measurement because both measurements measure individual IC components. Moreover, this paper adds VAICTM as the fourth measurement, so the measurements of IC are categorised into four categories, namely: (a) ROA measurement, (b) MCM, (c) VAICTM measurement, and (d) COB measurement.

4.2.2.1 ROA measurement

As a basis on which to calculate the value of IC, the ROA measurement takes the difference between a firm's ROA and the industry average ROA. Here, pre-tax earnings are divided by

the average total tangible assets to obtain the firm's ROA, which is then compared with its industry average ROA. The difference is then multiplied by the average total tangible assets of the firm to calculate average annual earnings from the intangibles. The estimate of the value of a firm's IC is obtained by dividing the above-average annual earnings by their average cost of capital or interest rate (Sveiby, 2010).

An example of ROA measurement is the 'Knowledge Capital Earnings' method that was developed by Lev (1999). 'Knowledge Capital Earnings' is calculated as the portion of normalised earnings (3 years industry average and consensus analyst future estimates) over and above the earnings attributable to a book value of assets; these earnings are then used to capitalise Knowledge capital.

4.2.2.2 MCM measurement

MCM measurement suggests that the IC value of a firm can be obtained by subtracting the net asset value from its observable market value (Chan, 2009a; b). MCM defines firm's IC as the difference between its net assets and market capitalisation. This measurement is based on an evaluation of the historical cost and balance sheet (Sveiby, 2010). Traditional MCM includes measuring the market-to-book value and Tobin's q invisible balance sheet.

Empirical evidence regarding the measurement of IC using the market-to-book ratio is mixed where in recent decades of increasing demand for IC disclosures, measurements of the market-to-book ratio as proxy for IC has been questioned (Li & Mangena, 2014). Van Der Meer-Kooistra & Zijlstra (2001) interviewed a number of CEOs, and discovered that they consider market-to-book ratios as insufficient indicators of IC, arguing that fluctuations in market values may coincide with unchanged levels of IC value, and since fluctuations in

market values may distort estimations of an IC value, excess market values may not be completely attributable to the IC value. These CEOs therefore concluded that the market-to-book ratio as a measure of IC value may be flawed because cannot measure IC effectively, as has been found in further empirical studies. For example, Kamath (2008); Ghosh & Mondal (2009) and Firer & Williams (2003) found insignificant results between information on IC and market-to-book ratio, and Cerbioni & Parbonetti (2007) found that market-to-book ratios did not present the overall value of IC.

To address these limitations, Tobin's q was used to indicate the value of IC in IC literature. Previous studies found that Tobin's q may approximate the value of IC because it attempts to provide a ratio of market value over the replacement values of tangible assets (Villalonga, 2004; Lindenberg & Ross, 1981). With these underlying assumptions, Tobin's q may partially reduce distortions in the market-to-book ratio, but previous studies found that it cannot represent an accurate measure of IC value and it has limited ability to represent IC in the context of long-term growth opportunities of firms (Goebel, 2015).

The most recent, long-run value-to-book ratio as a measurement of IC has been examined (Goebel, 2015). This approach assumes that IC value is investigated based on merger and acquisition events which provide enough additional information to estimate intrinsic firm values and long-run growth opportunities (Rhodes-Kropf et al., 2005; Goebel, 2015). Using the long-run value-to-book ratio as a measure of IC can indicate the long-term growth opportunities of firms. The author found that the long-run value-to-book ratio is an IC value measurement with the highest explanatory value when compared to the market-to-book ratio and Tobin's q.

4.2.2.3 VAICTM measurement

The VAICTM was developed by the Austrian Intellectual Capital Research Centre (AICRS) under Pulic (1997). An important concept in the VAICTM methodology is a firm's intellectual ability which is measured by its value added intellectual coefficient. This value added intellectual coefficient refers to the total value creation efficiency because both physical capital and IC function in concert in a business environment (Pulic, 2004). Furthermore, VAIC is an indicator of the overall ability or efficiency of a firm to use the total resources of physical capital and IC to create value for a particular firm (Chan, 2009a). A higher VAICTM coefficient shows that more value is created with the same amount of resources (Pulic, 2004). The VAICTM model uses values from balance sheets and income statements to measure any occurrences of adding value that either stems from or can be attributed to the development of firm's IC. For example, labour expenses are argued to equate human capital as an investment rather than an expense. VAIC measures how efficiently and how much IC and capital are used to create the value of a firm based on three major components: (1) capital employed; (2) human capital; and (3) structural capital (Goebel, 2015).

VAICTM has been used by many researchers to investigate different aspects of IC efficiency. For examples, studies have been found in Taiwan (Chen et al., 2005); Hong Kong (Chan, 2009a; 2009b); Singapore (Tan et al., 2007); Thailand (Phusavat et al., 2011); India (Kamath, 2008; Ghosh & Mondal, 2009); South Africa (Firer & Williams, 2003); Australia (Joshi et al., 2013; Clarke et al., 2011). Details can be found in sections 4.2.3 and 4.2.4 of this paper.

4.2.2.4 COB measurement

Component-based measurement is a measurement of individual IC components where interactions of IC components are seen to contribute greatly to IC value (Van Der Meer-Kooistra & Zijlstra, 2001; Goebel, 2015). Direct IC (DIC) measurement and Scorecard (SC) measurements are subject to this category.

DIC measurement

Under DIC measurement, the dollar-value of IC is estimated and assigned to what a firm may consider as individual components (e.g., intellectual property assets, human-centred assets, etc.). Once these components are identified, they can be evaluated directly and take the form of either a dollar value or an aggregated coefficient (Sveiby, 2010; Chan, 2009a).

An example of DIC measurement is Andersen & McLean's (2000) 'Total Value Creation' (TVCTM) model that uses discounted projected cash-flows to re-examine how individual IC component events affect planned activities (Sveiby, 2010). Another example is Andriessen's (2005) 'Value ExplorerTM' model. This model allocate and calculate the value of IC components into 5 types of intangibles: (1) Skills & tacit knowledge; (2) Technology and explicit knowledge; (3) Collective values and norms; (4) Primary and management processes; and (5) Assets and endowments (Sveiby, 2010; Goebel, 2015).

DIC measures IC using the dollar-value, but previous studies have revealed that nearly every instance of IC reporting involved the expression of IC in discursive rather than numerical terms. The low incidence of a quantitative expression of IC items seems to confirm the widely held view that firms are not motivated to assign dollar values to IC (e.g., Petty & Guthrie, 2000; Guthrie & Petty, 2000a; 2000b; Guthrie et al., 2006). Therefore, SC

measurements that can measure the non-dollar values components are now prevailing in recent IC literature.

SC measurement

Under the SC measurement, the various ICs are synthesised into a series of indicators and indices which are then reported on graphs or in a scorecard to measure the non-dollar values of IC components. The SC method is similar to the DIC method in that it assumes that no estimate is made for the dollar-value of IC (Sveiby, 2010).

A well-known SC measurement is the 'balanced scorecard' (Kaplan & Norton, 1992), which was originally used in management reporting. A balanced scorecard means that to understand a firm's entire performance, the non-financial information should be measured and disclosed under the 'scorecard,' as well as the financial information. A firm's performance is therefore measured by four perspectives of scorecard: (1) financial perspective; (2) customer perspective; (3) internal process perspective; and (4) learnings perspective (Chan, 2009a).

In 1997, Edvinsson & Malone developed the Skandia navigatorTM SC measurement where IC is measured by analysing up to 164 metric measures (91 intellectually based and 73 traditional metrics) that cover five components: (1) human; (2) customer; (3) process; (4) renewal and development; and (5) financial. They categorised IC as including human and structural capital, where human capital includes the knowledge, skills, competences and experiences of the people employed, while structural capital consists of firm's values, culture and philosophy (Edvinsson & Malone, 1997; Roslender & Fincham, 2001; Pike & Roos, 2004).

At almost the same time, the ‘Intangible Asset Monitor’ was developed by Sveiby (1997) to measure and report firm’s IC. In his method, management selects indicators based on the strategic objective of the firm in order to measure the four aspects of creating value from three classes of IC. The indicators are listed as being: (1) growth; (2) renewal; (3) utilisation; and (4) risk (Pucci, 2015). The three classes of IC consist of internal capital, external capital, and employee competence (Phusavat et al., 2011). Sveiby (1997) defined internal capital as knowledge that is created by an organisation and which cannot be separated from the entity; this knowledge includes concepts, patents, models, and administrative and computer systems, etc. Sveiby (1997) defined external capital as ‘relationships with customers and suppliers’. The external capital in Sveiby (1997)’s IC framework consists of profitability per customer, a satisfied Customers Index, and devoted customers, etc. Sveiby (1997) defined employee competence as an individual’s capacity to act in a wide variety of situations to create both intangible and tangible assets; this includes their education, skills, trainings, values, experiences and so forth (Joshi et al., 2013; Singh & Kansal, 2011).

While Sveiby’s IC framework has attracted widespread acceptance, Guthrie et al. (1999) recently extended Sveiby (1997)’s IC measurement framework to include 24 items that are divided into internal capital (including copyrights, trademarks, patents, management philosophy, management processes, information systems, financial relations, networking system, corporate culture), external capital (including brands, customer loyalty, customers, company names, licensing agreements, favourable contracts, franchising agreements, business collaborations, distribution channels) and human capital (including knowhow, vocational qualification, education, work-related competencies, entrepreneurial spirit, innovativeness, proactive and reactive abilities, changeability, work-related knowledge). Meanwhile Abeysekera & Guthrie (2005) and Abeysekera (2008) provided a more comprehensive list of IC with 45 items where they describe human capital as the skills and

abilities of employees that generate value for a firm; this consists of 25 items. Internal capital is described as organisational capital that consists of 10 items, and external capital refers to the firm's relationships with external parties, including suppliers and customers, and consists of 10 items.

The COB measurement used to measure IC has been applied extensively in literature; for example, studies have conducted in USA (Abdolmohammadi, 2005), Sri Lanka (Abeysekera & Guthrie, 2005; Abeysekera, 2011a; b), Australia (Guthrie & Petty, 2000a; b; c; Guthrie et al., 1999), Hong Kong and Australia (Guthrie et al., 2006), Australia and Sri Lanka (Abeysekera, 2007), Italy (Ferraro & Veltri, 2011), German (Gamerschlag, 2013). For detailed information see sections 4.2.3 and 4.2.4 of this paper.

4.2.2.5 The advantages and disadvantages of each measurement

Based on the literature (Chan, 2009a; b; Andriessen, 2004; Bontis, 2001; Caddy, 2002; Pike & Roos, 2004; Sveiby, 2010; Goh, 2005; Tseng & Goo, 2005; Phusavat et al., 2011; Clarke et al., 2011; Chu et al., 2011; Maditinos et al., 2011; Chang, 2007; Joshi et al., 2013), the advantages and disadvantages of each measurement are summarised in table 20 below:

Table 20: Advantages and disadvantages of different IC measurements

Measurements	Advantages	Disadvantages
ROA	<p>1.offer dollar-valuations which are useful for stock market valuations and in acquisition and merge situations;</p> <p>2.can be used for firms between firms within the same industry;</p> <p>3.are easily collected and communicated in the accounting profession</p>	<p>1.using dollar-measure as proxies for IC is far removed from the actual event or action that caused the phenomenon then they are at once incomplete;</p> <p>2.very sensitive to discount and interest rate assumptions;</p> <p>3.measure only on the organisation level;</p> <p>4.ROA approaches tend to be based on industry comparisons rather than the company itself;</p> <p>5.several of them are not useful for non-profit and public sector firms as well as internal departments</p>
MCM	<p>1.offer dollar-valuations which are useful for stock market valuations and in acquisition and merge situations;</p> <p>2.can be used for comparisons between firms within the same industry;</p> <p>3.are easily collected and communicated in the accounting profession</p>	<p>1.using dollar-measure as proxies for IC is far removed from the actual event or action that caused the phenomenon then they are at once incomplete;</p> <p>2.market value of a company varies from day to day, and may be subject to speculation in the capital market;</p> <p>3.this approach does not easily assist managers to understand what IC is, how it exists or how it influences the dynamics of a business as it does not immediately identify the components of IC;</p> <p>4.several of them are not useful for non-profit and public sector firms as well as internal departments</p>
VICA TM	<p>1.easy to calculate;</p> <p>2.can be applied to any size of organization and it aims to measure a company's IC level;</p> <p>3.it does not require expertise to use or understand and does not require sophisticated accounting knowledge and</p>	<p>1.omitted the Research & Development (R&D) expenditure and intellectual property which may capture additional information on IC;</p> <p>2.disregards the level of firm risk, which is one of the most important factors determining the IC value and firm value;</p> <p>3.inability to measure IC in a firm with negative operating profit or negative book value.</p>

Table 20: Advantages and disadvantages of IC measurements (continued)		
Measurements	Advantages	Disadvantages
COB	1.create a more comprehensive view of a firm's health than financial metrics; 2.easily applied at any level of a firm; 3.measure closer to an event and reporting, therefore be more accurate and more faster than pure financial measures; 4. useful for non-profit firms, public sector firms and internal departments and also for social and environmental purposes; 5.suit best for uncovering the hidden value of a firm.	1.indicators are contextual and have to be customised each purpose for each firm, which makes comparisons not easily reached; 2.new and not well accepted by some societies and managers; 3. subjective

4.2.3 IC and firm's financial performance

Whether IC can enhance a firm's financial performance is uncertain. A number of studies have confirmed that IC represents strategic advantages for a firm's economic performance, and also contributes to their value creation, however, some studies do not find a relationship between IC and a firm's financial benefits.

Chen et al. (2005) examined the value creation of IC for firms' current and future financial performance using data drawn from Taiwanese listed firms. The authors used VAICTM measurement to measure the efficiency of IC and used return on assets (ROA), return on equity (ROE), growth in revenues, and employee productivity to measure a firm's financial performance. The results revealed that a firm's IC is significantly positive when associated with their current and future financial performance, which suggests that IC contributes to a firm's current and future financial value creation. In a further study, Chan (2009a; b) investigated the relationship between IC and financial performance using Hong Kong listed firms over the period of 2001 to 2005 as a sample; IC was measured by VAICTM

measurement, and a firm's financial performance was measured by ROE and ROA. The results indicated that IC helped to increase ROE and ROA. Tan et al. (2007) investigated the association between IC disclosure and their financial performance using 150 publicly Singapore Exchange listed firms; IC was measured by VAICTM measurement, and a firm's financial performance was measured by ROE and EPS. The findings indicated that IC was correlated to future firm performance and the rate at which a company's IC grows was positively related to company performance. Phusavat et al. (2011) examined the influence of IC on the financial performances of manufacturing firms in Thailand; IC was measured by VAICTM measurement and financial performance was measured by ROE, ROA, growth in revenue, and employee productivity. The results indicated that IC positively affected a manufacturing firm's financial performance and thus highlighted how IC strengthened a manufacturing firm's long-term competitive advantage.

Some studies did not find a relationship between IC and future economic benefits, and consequently argued that IC does not fully explain a firms' financial performance.

Kamath (2008) examined the relationship between IC and firm performance using the top 25 firms in the drug and pharmaceutical industry in India as a sample; IC was measured by the VAICTM measurement and financial performance was measured by profitability (measured by ROA) and productivity (measured by revenue to book ratio 'ATO'). The results indicated that IC had an insignificant impact on the ROA and ATO, but a correlation analysis indicated that human assets were more important than the physical and structural assets in the profitability and productivity of Indian pharmaceutical industry. Al-Twaijry (2009) examined how investment in IC affected firms' future growth and how those factors influence their investment in IC based on data from 384 Japanese listed manufacturing firms. Investment in IC was measured by a DIC measurement of IC; the results indicated that investment in IC

was not always positively related to or lead directly to future growth, and these investments could be affected by some other variables. Firer & Williams (2003) examined the relationship between IC and firm performance (profitability and productivity) using a sample of 75 publicly traded firms in South Africa; IC was measured using the VAICTM measurement, profitability was measured by ROA and productivity was measured using revenue to book ratios (ATO). The results indicated there was no relationship between IC and firm performance and the associations between the IC and firms' profitability and productivity were generally limited and mixed, which suggested that physical capital remains the most significant underlying resource of corporate performance in South Africa, despite efforts to increase the nation's IC base. Similarly, Ghosh & Mondal (2009) examined the relationship between IC and firm performance using Indian software and pharmaceutical firms as a sample frame; IC was measured using the VAICTM measurement, and firm performance was measured by profitability (ROA) and productivity (ATO). The results indicated that IC does not fully explain the performance of firms in India, while the findings suggested that a firm's IC performance could explain profitability but not productivity.

4.2.4 Value relevance of IC

From the perspective of market valuation, many studies found that investors perceive IC as value-relevant with regards to decision-making, and they generally react favourably to such reporting, so a firm's stock price or market value would be enhanced in this sense.

The most widely used tool to measure the market valuation of IC is market-to-book ratios. Studies have confirmed that IC has positive effects on the market-to-book ratios in Taiwan (Chen et al., 2005; Tseng & Goo, 2005), Greece (Madininos et al., 2011), Hong Kong (Chan, 2009a; 2009b) and Thailand (Phusavat et al., 2011), which suggests that IC is value-relevant

for market valuation because it increases the market value of a firm. Notwithstanding those results, some scholars have criticised the market to book ratio as a market valuation measurement (see, section 4.2.2.2).

Several studies examined the relationship between IC and stock prices or stock returns to measure its value relevance; for example, Tan et al. (2007) found a positive relationship between IC and stock returns in 150 Singapore listed firms, while Vafaei et al. (2011) investigated whether the extent of textual IC information in annual reports and its components (human, structural, relational and general) is value-relevant to the share market, and whether IC disclosure moderates the incremental value relevance of reported IFRS adjustments to earnings and equity, based analysing the contents of the text in annual reports using a sample of listed firms in Australia (63 firms), Britain (58 firms), Singapore (50 firms) and Hong Kong (49 firms). IC was measured using the SC measurement. The study found that IC disclosure was positively related to the market price of firms in non-traditional industries in two (Britain and Hong Kong) of the four countries. Furthermore, the incremental value relevance of IFRS earnings and IFRS net assets was insignificant, but the interaction of IFRS earnings with IC disclosure increased the basic coefficients and explanatory power of the models quite considerably, which suggested that IC moderated the value relevance of reported IFRS earnings numbers. Abdolmohammadi (2005) examined the effects of IC disclosure on the market capitalisation of firms by analysing the contents of annual reports of a sample of 500 firms in the USA; market capitalisation was measured using a logarithm of market capitalisation, and IC was measured using a SC measurement. The results indicated a positive relationship between the market value of equity of firms and IC disclosure.

However, other studies found that the market cannot incorporate IC and immediately absorb all the IC information.

Ferraro & Veltri (2011) applied a simplified Ohlson model (1995) to examine the value relevance of IC to 524 firm-year observations of Italian firms for the period of 2006 to 2008. IC was measured using the SC measurement; the findings showed that the book value of equity and earnings was positively related to the stock price despite IC not having a meaningful relationship to the market value. These results suggest that Italian investors are perhaps unable to detect and incorporate information on IC to evaluate their business investments. Abeysekera (2011a) examined the influence of political setting (civil war from 1998-2000 versus temporary truce from 2002-2004) on firms' current narrative using a sample of top 30 Sri Lankan listed firms from 1998 to 2004, where numerical and visual IC disclosure is included in the current market value of equity. IC was measured using the SC measurement, and indicated that during the civil war, the current market value of equity only included current earnings and net book value it did not include visual, narrative, and numerical IC disclosure. During the temporary truce, although the current market value of equity included the current earnings, net book value, and narrative disclosure, it did not include numerical or visual IC disclosure. In a further study, Abeysekera (2011b) examined whether current-period IC disclosure can carry future earnings towards current annual stock returns during a civil war period using the top 30 Sri Lankan listed firms over six years (from 1998 to 2003). The study found that an increase in the current period of IC disclosure did not influence earnings or future earnings included in the current stock returns during the civil war period. Gamerschlag (2013) investigated the value relevance of human capital information where information was provided voluntarily by German firms using two established valuation models; IC was measured using the SC measurement, and the results indicated that human capital was significantly and positively related to the current stock price, suggesting that information regarding human capital is value-relevant to the market. Nonetheless, this information regarding human capital did not lead to short term changes in market value

because the index containing these changes in human capital did not lead to changes in current stock returns. As a result, the author concluded that human capital information is value-relevant, but not immediately.

The literature reveals that whether or not IC enhances financial performance, and whether it is value-relevant for investors in decision making depends on the methodology that the study used, and the countries and research periods that were examined.

4.2.5 IC in Australia

4.2.5.1 Development of IC in Australia

Australia provides an ideal ground for IC reporting because it has experienced fast economic growth and is also undergoing a transformation with an increasing emphasis on new sectors such as niche manufacturing, information technology, tourism, and financial services. It is also experiencing a relative decline in its traditionally strong areas of mining and agriculture (Guthrie et al., 1999; Abeysekera, 2008).

An early study based on Sveiby's (1997) IC framework used content analysis to capture IC data from annual reports. In the early 21st century, Guthrie and his team focused on the IC disclosure of the largest (by market capitalisation) Australian listed firms, and noted that most of the IC information reported was on external capital, while reporting on internal capital and human capital were distributed evenly. The main areas of IC reporting focused on intellectual property rights, technology, human resources, and organisational and workplace structure. The study concluded that even though Australian firm were thought of as 'best practice' in IC reporting, the key components of IC were poorly understood, inadequately identified,

managed inefficiently, and were not reported within a consistent framework. Overall, the results indicated that few Australian firms appeared to take a conceptual approach to reporting their IC (Guthrie, et al., 1999; Guthrie & Petty, 2000a; b).

In a further study, Guthrie et al. (2006) examined the voluntary disclosure of IC attributes for 50 listed Australian firms and 100 listed Hong Kong firms using year 2002 data. Here, 24 items were collected using content analysis and then divided into three categories (nine relating to internal capital, nine to external capital and six to human capital). The levels of voluntary IC disclosure were found to be low, and in qualitative rather than quantitative form in both countries, and in 2002, Australian firms disclosed more IC information than Australian firms in 1998 and Hong Kong firms in 2002.

Abeysekera (2007) compared the level of IC reporting of large listed firms (based on market capitalisation) in Sri Lanka with the level of IC reporting of large listed firms in Australia using content analysis to capture the IC data. The results suggested that unlike Australian firms, firms in Sri Lanka reported more on brand building, and while the disclosure of human capital was higher in Sri Lanka than in Australia, Australian firms were far more involved in R&D than Sri Lankan firms, and investors in Australia were willing to support such entrepreneurship, while the disclosure of internal capital by Sri Lankan firms was less than in Australia. The author argued that this occurred because the Australian government was more supportive of the entrepreneurial culture than the Sri Lankan government, and Australia has more comprehensive laws to protect intellectual property rights. In conclusion, there were differences in IC reporting between Sri Lankan and Australian firms that could arguably be attributed to social, economic, and political factors.

All of the above studies empirically examined Australian firm practices in reporting and managing IC. They carried out a content analysis of top listed Australian firms to understand

the extent to which these firms report their IC, and also applied content analysis to capture the IC in annual reports by frequency count. The authors also conducted interviews to provide a deeper understanding of how firms measure, identify, report and manage IC. In their research, the authors used the IC framework developed by Sveiby (1997) to divide IC into three categories: internal capital, external capital and employee competence/human capital. Overall, firms do not have a consistent framework for IC reporting (Abeysekera, 2011).

4.2.5.2 The IC and financial performance in Australia

Evidence about IC and a firm's financial performance in Australia generally supports the belief that IC can enhance their financial performance as well as carrying useful looking forward financial performance values that are relevant for investors evaluating firm value.

For example, Joshi et al. (2013) examined the relationship between IC measured by VAICTM and firm financial performance measured by ROA in the Australian financial sector for the period from 2006 to 2008. The study found that all Australian owned banks have human capital that is slightly more efficient than structural capital and capital employed. The study also found that the size of the bank in terms of its total number of employees, total assets and total shareholders' equity, had little or no impact on their IC efficiency. Clarke et al. (2011) examined the effect that IC efficiency has on the firm performance of Australian listed firms between 2004 and 2008 where IC efficiency was measured by VAICTM and financial performance was measured by ROE, ROA, growth in revenues and employee productivity. The results indicated there was a positive relationship between IC efficiency and the performance of Australian listed firms, particularly regarding capital employed and human capital efficiency, as well as a positive relationship between human capital and structural

capital efficiency in the prior year and performance in the current year. Kim & Taylor (2014) compared the value relevance of the productivity of IC and its components, and the productivity of the book value of assets based on a sample of 160 Australian listed firms from 2006 to 2010. The study developed models that drew on publicly available share prices and accounting numbers to compute and compare the value relevance of the productivity of IC (as well as its components of structural and human capital). IC was measured using a components-based direct IC measurement using hand-collected annual reports. The results showed that the productivity of structural capital, human capital, and IC were each positively associated with the share price, whereas the productivity of total assets at book value was insignificant and tangible assets were negatively significant. The authors concluded that the book value of intangible and tangible assets in the balance sheet have no value relevance, while only a fraction of IC was represented by intangible assets in the balance sheet. The papers discussed in the literature review are summarised in Appendix 1.3.

4.3 Theoretical framework and development of hypotheses

4.3.1 Resource-based theory

4.3.1.1 Definition of resource-based theory

Resource-based theory originated in the field of economics in the work of Penrose (1959), also known as the theory of firms. Resource-based theory asserts that firms have resources that are not established identically, and when they are maintained for a long time, they can result in long-term revenue (Penrose, 1959, p.24). In resource-based theory a firm is seen as a nexus between resources and capabilities that can enhance economic benefits and become a

powerful source of sustained competitive advantage (Lado & Wilson, 1994). These resources and capabilities cannot be duplicated by competitors.

4.3.1.2 Key concepts of resource-based theory

The key concepts of resource-based theory are the resources and capabilities.

‘Resources’ have been variously defined by resource-based theorists and can include tangible and intangible items (Hofer & Schendel 1978). The difference between providing short-term competitive advantages and those that are sustainable resides in the notion that these resources cannot be imitated by another firm (non-imitable), they are unevenly distributed and deployed across firms within a given competitive environment, (heterogeneous), and irreplaceable by another resource (non-substitutable) (Olalla, 1999; Barney 1991; Abeysekera, 2011). In orchestrating a firm’s resources, managers must select, develop, and bundle tangible and intangible resources to create capabilities (Sirmon et al., 2007); where ‘Capabilities’ are defined as joining resources to produce activities or works (Grant, 1991). Grant also stated that capabilities are a combination of resources that become the basis for creating firm value and sustaining competitive advantage. Tangible and intangible resources are bundled to create capabilities; for example, technology, scientific equipment and human capital are bundled to create a research and development capability (Sirmon et al., 2007). Understanding the relationship between resources, capabilities, and performance helps firms identify their strengths and weaknesses (Hitt et al., 2015).

4.3.1.3 Application of resource-based theory in the literature

Resource-based theory has been found in supply chain management research where it was used to identify and highlight how a supply chain can contribute to a firm's competitive advantage. For example, Barratt & Oke (2007) found that supply chains that are highly visible are valuable resources that can deliver a sustainable competitive advantage to a supply chain linkage. Das & Buddress' (2007) study found that focusing on external value-network resources can help to develop firm-specific capabilities, while Bititci et al. (2011) found that organisational learning by effectively managing knowledge and networking is a critical competence that enables firms to develop innovative responses to unpredictable contexts and thus sustain competitive advantage and performance.

Resource-based theory has become increasingly popular in performance management research in recent decades because the ultimate goal of performance management is to satisfy customers by providing greater value through enhanced efficiency and effectiveness (Liyanage & Kumar, 2003; Hitt et al., 2015). Resource-based theory provides a useful view of how performance can be managed based on the argument that the valuable, rare, inimitable, and non-substitutable resources will improve firm performance. For example, Mesquita et al. (2007) found that investments in new resources and capabilities were positively associated to the level productivity, which suggests that firms enhance their performance when they successfully create links with critical suppliers while excluding competitors from forming the same relationships. Reuter et al. (2010) found that the explicit and tacit categories of information technology resources improved financial performance and sustained competitive advantages, while Jeffers et al. (2008) found that a distinct competence or capacity to manage and make better use of information technology can help firms achieve a competitive advantage in the short term, or a sustained advantage in the long run.

According to resource-based theory, firms' valuable resources and specific capabilities are necessary for innovation, so research is fruitful in product/service innovation literature. For example, Lewis et al. (2010) examined how two 'classic' and 'extended' resource-based advantages might combine to create a long-term advantage, process and organisational innovation; they also found that unbounded external resources such suppliers engaged in developing new product could create an initial advantage for firms. Camison & Lopez (2010) examined the indirect effects of manufacturing flexibility on organisational performance while considering product, process, and organisational innovation as mediating variables. The results indicated that organisational capabilities mediate manufacturing flexibility and performance, which can create competitive advantages. Menor & Roth (2008) found that the technical system and work force are resource capabilities that can also be managed to drive competitive advantage.

IC is seen as a valuable resource that is more likely to produce a competitive advantage because it is difficult to imitate and even more difficult to substitute (Craighead et al., 2009; Hitt et al., 2001; Hitt et al., 2006). IC is seen as a 'claim to future benefits', so many analyses have been carried out to demonstrate a causal link between IC and value creation using resource-based theory (Ashton, 2005). Analyses linking IC to performance measures such as return on equity (Chen et al., 2005; Phusavat et al., 2011; Clarke et al., 2011), revenue growth (Chen et al., 2005; Phusavat et al., 2011; Clarke et al., 2011) return on assets (Joshi et al., 2013; Chen et al., 2005; Phusavat et al., 2011; Clarke et al., 2011) and productivity (Chen et al., 2005; Phusavat et al., 2011; Clarke et al., 2011)²⁸, have also been carried out.

²⁸ As section 4.2.3 of this paper has already presented each research in great details, thus for the brevity, this paper does not discuss those studies in details here again.

4.3.2 Signalling theory and voluntary IC disclosure

Although resource-based theory has become popular in IC literature, it has also been criticised (Priem & Butler, 2001). Some criticisms include the static nature of these arguments and the fact that it ignores the potential influence of the external environment (Hitt et al., 2015). Thus, this paper adopts signalling theory to complement resource-based theory to examine the value relevance of IC disclosure.

According to signalling theory, signalling would make investors and other stakeholders reassess the value of a firm before making decisions that are more favourable to the firm (Whiting & Miller, 2008). Firms have several ways of signalling information about themselves, of which voluntary disclosure of positive accounting information is considered to be one of the most effective (Ross, 1977; Watson et al., 2002; Xiao et al., 2004). Healy et al. (1999) found that increased voluntary disclosure leads to an increase in stock price, so voluntary IC disclosure could be a very effective means for firms to signal their superior quality due to the significance of IC for future wealth creation and forward looking benefits (Guthrie & Petty, 2000; Whiting & Miller, 2008); so for firms with a strong IC base, voluntary disclosure of IC could distinguish them from other low quality firms.

Paper one section 2.3.2 of this thesis presented the three major motivations for management to voluntarily disclose positive information to outside users: management talent signalling, limitations of mandatory disclosure, and information asymmetry. The motivations for signalling IC may also follow these projections. Since studies found that the lack of value relevance with regards to financial reporting due to insufficient disclosure of IC, a sufficient disclosure would obviously help in the decision making process and would fill the gaps made by mandatory financial reporting.

A reduction in information asymmetry between a firm and external users is a major reason for voluntary IC disclosure because according to some scholars, inadequate IC disclosure disadvantages average investors compared to knowledgeable insiders, so a firm is at risk of insider trading (Leadbeater, 1999; Vergauwen & Van Alem, 2005). This could potentially make capital more costly because investors demand a premium for bearing risky information, therefore IC signalling would reduce information asymmetry and enable a firm to obtain more capital investment at a reduced risk (Mangena et al., 2014; Brüggen et al., 2009; Tan et al., 2007). A better assessment and belief in future wealth creation capabilities might raise a firm's share price, and their market capitalisation (Williams, 2001). In this sense a firm's share price would rise with adequate IC disclosure, so failure to provide relevant information about IC may weaken their financial position and reduce their competitiveness in the long term (Canibano et al., 1999). In fact, investors find it difficult to assess firm value and allocate resources when financial statements do not report IC, and as a consequence, the stock price of firms with adequate disclosure of IC would be higher than firms with inadequate disclosure.

Some studies also suggest that signalling management talent to the market could be a strong motivation to disclose IC information (e.g., Garcia-Meca et al., 2005; Oliveira et al., 2006; Rodgers, 2007), because managers are more likely to signal their ability to make firms grow over the long term. When investors buy shares or when customers enter into a relationship with a firm, these associations are not based on a particular product or set of products, they believe the firm will continue to develop processes over the long term that will enable it to capitalise on emerging technologies and change market needs to create useful and profitable products and services (Brüggen et al., 2009; Petty et al., 2008). IC that enhances a firm's performance in the long term signals a manager's ability to manage, so by signalling IC

information, these firms display their wealth creating capabilities to the public over the long term, and which in turn may enhance their stock price.

4.3.3 Application of signalling theory in IC literature

Empirical studies have examined IC disclosure using signalling theory and confirmed that it could reduce the risk of insider trading, lower the cost of capital, decrease the misallocation of capital, increase incentives for entrepreneurs and knowledge workers, and reduce market volatility (An et al., 2011; Rodgers, 2007).

Van der Meer-Kooistra & Zijlstra (2001) reported that failure to disclose information regarding investments in IC leads to an underestimation of future earnings, increases investors' perception of risk, and thereby increases the cost of capital. Chan et al. (2001) provided similar findings arguing that the cost of capital increases if R&D intensive firms fail to disclose sufficient R&D. Chan et al. (2001) confirmed that lack of information on IC imposes real costs on investors through increased uncertainty about firms' future performance. Various studies have suggested greater disclosure of IC to reduce the information asymmetry component of the cost of capital, which in turn decreases the returns required by investors (e.g., Sengupta, 1998; Botosan, 1997; Coles et al., 1995; Elliot & Jacobson, 1994; Diamond & Verrecchia, 1991). Based on surveys and questionnaires, Youndt et al. (2004) and Reed et al. (2006) found that firms with more distinctive IC profiles generated higher returns than firms with less developed IC. According to this argument, firms with a high level of IC value are expected to perform well.

Some other studies in the area believe that signalling IC would improve corporate reputation (e.g., Abeysekera, 2011), create an understanding of its products or services, and improve

relationships with various stakeholders (e.g., Bozzolan et al., 2003; Whiting & Miller, 2008).

4.3.4 Development of hypotheses

To make useful signals it is important to make an inimitable signal to competitors. This paper argues on the basis of signalling theory which assumes that a good quality firm is likely to use multiple signals to entice its investors to view them favourably. IC is a very effective signal to the market of firm quality because according to resource-based theory, it is rarely imitable and replaceable. Therefore IC disclosure can signal firm performance to outsiders, which influences investors' perceptions of firm performance, which in turn affects the stock price. Although empirical tests of this theory provided mixed results, following the findings of prior researches such as Chen et al. (2005), Phusavat et al. (2011), Joshi et al. (2013), Tan et al. (2007) and the tenets of resource-based theory and signalling theory, this study expects that IC disclosure will be positively related to current and future financial performance, so the hypothesis is presented as follows:

H8: IC disclosure is positively associated with firms' current and future financial performance.

The signalling process will make investors reassess firm value, so the disclosure of IC, which is an inimitable resource that signals future growth, enhances the stock price because investors place more value on firms who disclose more IC (Firer & Williams, 2003; Petty et al., 2008; Brennan & Connell, 2000). Following earlier findings regarding the benefits to the capital market of disclosing enough IC because it reduces the information asymmetry component of the cost of capital and helps them to gain a competitive advantage or ensure

market dominance, it is reasonable to propose that financial professionals reward the voluntary disclosure of IC information. Therefore, this thesis provides the below hypothesis:

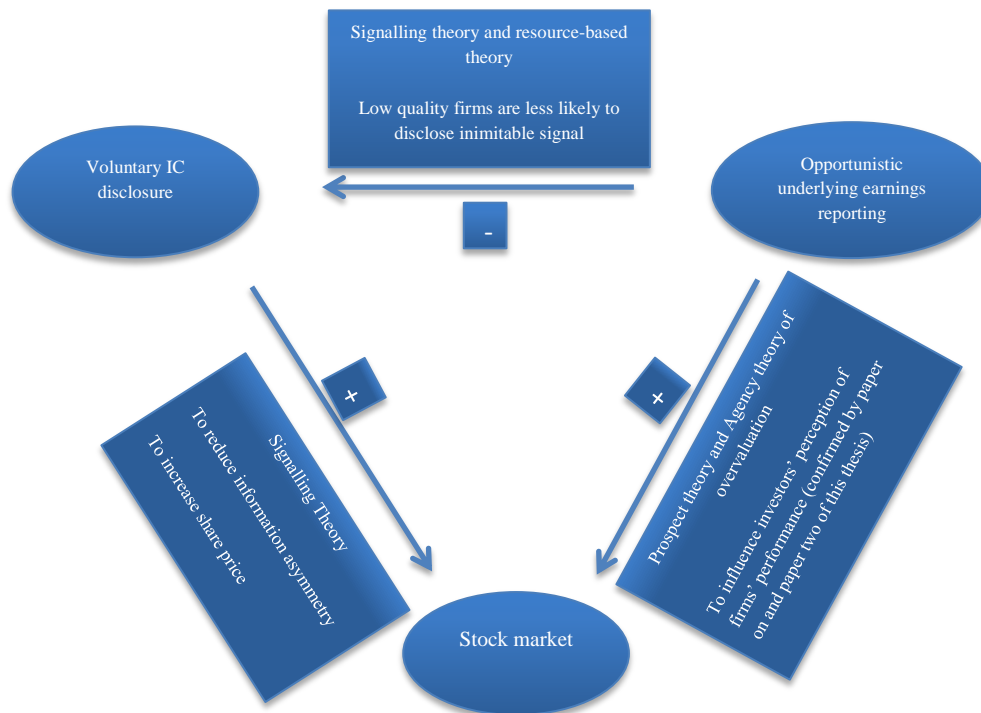
H9: The IC disclosure is value-relevant to market to evaluate firm value.

The market comprises different levels of investors, but if it is insufficient, investors may be unable to distinguish between high quality firms and low quality firms. Investors may reward firms for any favourable positive accounting information, whereas the market rewards firms with sufficient IC disclosure, as is supported by severable studies (e.g., Vafaei et al., 2011; Joshi et al., 2013). However, positive accounting information can also be achieved when managers use earnings management techniques. Prior studies have argued that firms may manipulate perceptions resulting in overvaluation by investors without adequate information regarding IC (e.g., Rodgers, 2007). Deficient IC disclosure escalates information asymmetry between insiders and outsiders, and provides fertile ground for insiders to extract personal benefits rather than act in the best interests of outsiders (Singh et al., 2008). Paper one and paper two have argued that opportunistic underlying earnings reporting is now perceived as being less detectable earnings management tool that affects investors' perceptions of firm performance. This paper assumes that if IC, which is a firm's valuable resources that are difficult for low quality firms to imitate, truly signals firms' potential growth and competitive advantage, then low quality firms will find it difficult to follow these signalling strategies, and engage in opportunistic underlying earnings reporting to influence the market. In this sense, firms with opportunistic underlying earnings reporting are less likely to make sufficient IC disclosure, and therefore this thesis presents the following hypothesis:

H10: IC disclosure is negatively related to opportunistic underlying earnings reporting.

The relationships described above are summarised in figure 7. Managers disclose IC through annual reports with the assumption that it will enhance firm value because it represents firms' inimitable resources that enhance firms' current and future performance; as is argued by resource-based theory. It is possible however that these strategies also allow managers to satisfy personal interests (McWilliams & Siegel, 2001; Toms, 2002). The purpose of signalling is to influence investors' perceptions of firm value in terms of increasing the stock price. Whilst the market will be influenced by factors such as unforeseen variables, the assumption is that stock price can be influenced through the disclosure process, so the value of IC will be a function of uniqueness and difficulty of imitation. Thus, if firms are able to create IC that is inimitable, managers will be able to make disclosures through annual reports, which competitors will also find impossible to imitate without making false declarations. High quality firms can disclose sufficient IC, whereas low quality firms find this difficult to follow. As incentives from market valuation, low quality firms will find other ways to influence the market, and since making false IC disclosures is costly, a firm with insufficient IC would find it very difficult to imitate. Therefore, low quality firms will pursue opportunistic underlying earnings reporting to influence investors' perceptions because it is less likely to be detected. This is supported by the results of paper one and paper two.

Figure 7: Flow chart of theoretical framework for IC reporting and opportunistic underlying earnings reporting based on signalling theory and resource-based theory



4.4 Research design

4.4.1 IC data capture

4.4.1.1 Content analysis

Guthrie and his team (Guthrie et al., 1999; Petty & Guthrie, 2000; Guthrie & Petty 2000a ; b) stated that most IC information disclosed for Australian firms is expressed in discursive rather than numerical terms because it is believed that using a scorecard to measure IC is appropriate²⁹. This study measures IC using the SC measurement based on an IC framework

²⁹ The other reason for using SC measurement is because the literature review section reveals that VAICTM method is applied more frequently among the scholars for firm value creation studies, however, the SC as good measurement for hidden value creation (Sveiby, 2010) is still limit in the literature. Therefore, to fill the gap, this paper uses SC method to measure the IC.

developed by Sveiby (1997) and further modified by Guthrie et al. (1999), Abeysekera & Guthrie (2005) and Abeysekera (2008). Using the content analysis for SC measurement of IC is the most popular method, although as a research instrument it is tested rigorously (Abeysekera, 2008; Guthrie et al., 2004). It is widely used in fields such as social, environmental, accounting (e.g., Andrew et al., 1989; Cameron & Guthrie 1993; Choon et al. 2000; Newson & Deegan 2002), and especially in IC studies (Guthrie et al., 1999; Petty & Guthrie, 2000; Guthrie & Petty, 2000a; b; Olsson 2001).

Content analysis is defined as ‘a technique for gathering data that consists of codifying qualitative information, in literary and anecdotal form, into pre-defined categories in order to derive quantitative scales of varying levels of complexity to track patterns in the presentation and reporting of information’ (Abbott & Monsen 1979, p.504). This method attempts to manifest and determine the written content or the content of other published communications by means of an objective, systematic, and reliable analysis (Krippendorff, 1980; Guthrie, 1983; Guthrie et al., 2004). Content analysis assumes that important subject matter is indicated by frequency counts (Krippendorff, 1980), so for content analysis to be effective, studies should meet certain technical requirements (Guthrie & Mathews, 1985). First, the categories of classification must be clearly and operationally defined; second, information can be quantified; third, the core is objectivity, which means that an item either does, or does not belong to a particular category, and a reliable coder is needed for consistency.

This paper conceptualises IC according to Abeysekera (2008)’s framework because he provided a more comprehensive list of IC items (Abeysekera, 2011). The IC framework presented was modified so that items likely to be reported by Australian firms will converge better. Under a category of internal capital, this paper combined patents, copyrights, and trademarks into one category named as intellectual property. Under a category of external

capital this study added favourable relations with stakeholders, and this includes customer relationships, public relations and relationships with suppliers. This item was added because this paper believes that strong relations with stakeholders can bring economic benefits to a firm. Several changes were made to the human capital items; the union activity item, as shown in Abeysekera (2008)'s framework, was entered into employee involvement in the community because there were only 9 frequency counts found in the union activity item. The employee measurement combined the average professional experience item and expert seniority item into one item known as professional experience, and average value-added per expert and value added per employee were combined into an item called value-added by employee. The median age of employee item was deleted. These changes were made because in Sri Lanka there are tables called 'Expertise', charts called 'Age wise analysis of corporate & senior management, charts called 'service analysis of executives KVPL' and statement called 'statement of Value Added of the Company' to present average professional experience, value-added per employee, or expert, and senior expert. There are no such charts or statements in Australia that systemically present that sort of information. Information regarding professional experience can be found in a director's profile, while value added by employee can be found in any section of annual reports in listed Australia firms. Further changes were as follows: average education level, vocational qualifications and education were combined into one item called education; race, gender, religion, and disabilities were combined into one item named as employee diversity to present equity issues. Finally, employee benefits, employee compensation plans, employee share and share option scheme, were combined into one item called employee welfare. Executive compensation plans, executive share, and share option plans were excluded because they are part of executive remuneration packages listed in remuneration reports which summarises the remuneration arrangements applicable to key management personnel in accordance with the Corporations

Act 2001 and its Regulations, which do not fit the executive compensation plan defined by Abeysekera's (2008) framework³⁰. Consequently, internal capital comprises 8 items (including Intellectual property; Management processes; Technological processes; Information systems; Network systems; Management philosophy; Corporate culture; Financial relations). External capital comprises 11 items (including Brands; Customer satisfaction; Quality standards; Company names; Favourable contracts; Business collaborations; Licensing agreements; Franchising agreements; Distribution channels; Market share; Favourable relations with stakeholders), and human capital comprises 14 items (including Employee involvement in the community; Employee thanked; Employee featured; Employee numbers; Professional experience; Value added by employee; Know-how; Education; Career development; Training programmes; Entrepreneurial spirit, innovativeness, proactive and reactive abilities and changeability; Employment safety; Workplace diversity; Employee welfare).

To undertake a content analysis of the 610 annual reports³¹, the IC items collected from reading and analysing annual reports were entered into a coding sheet for four separate years. A numerical coding scheme was used for each IC item. For each firm, the frequency of occurrence of each IC item was used to present the level of IC disclosures; zero was used if the IC item did not appear in the annual report.

³⁰ Abeysekera (2008) defines the executive compensation plan as 'recompense executive staff for their effort towards the firm in addition to their statutory entitlements' (p.87)

³¹ Annual reports are an ideal research object to apply the IC framework to because they are a good proxy to measure the comparative positions and trends of IC between firms, industries and countries (Abeysekera, 2008). Much of the published research has used annual reports as audit objects to ascertain the status of the IC of firms within countries (Guthrie et al., 1999; Brennan, 2001; Olsson, 2001; Abeysekera, 2008) and between countries (Subbarao & Zeghal 1997; Abeysekera, 2008). Also, annual reports represent the concern of individual corporations in a comprehensive and compact manner.

4.4.1.2 Threats to the validity and reliability of the content analysis

The terms validity and reliability are often expressed in relation to quantitative methodology (Black & Champion 1976, p.221; McKinnon 1988). The term ‘validity’ is defined as the property of a measure that allows researcher to say that an instrument measures what they say it measures (Abbott & Monsen 1979; Ragin, 1994, p.193; Abeysekera, 2008, p.61). It is concerned with the question to be studied (McKinnon, 1988, p.36). The term ‘reliability’ is defined as the ability of an instrument to consistently measure what must be measured (Black & Champion 1976, p.234; Ragin, 1994, p.190; Abeysekera, 2008, p.61); it is concerned with whether a researcher is obtaining reliable data (McKinnon, 1988, p.36). Since raw data in annual reports cannot be used for research purposes, it must be entered into a coding sheet in terms of IC items; a process can threaten validity and/or reliability and lead to two errors. First, IC items in an annual report may not reflect all the issues of interest that are actually embedded in the annual report. Second, raw data can be inaccurately coded into the coding sheet, and categorising raw data can affect the validity and reliability of the research results (Abbott & Monsen 1979).

4.4.1.3 Overcoming threats to content analysis

According to Milne & Adler (1999) and Guthrie et al. (2004), three main techniques are used to reduce concerns about reliability and validity in content analysis: by selecting disclosure categories from well-grounded relevant literature, and clearly defining them; by establishing a reliable coding instrument with specific decision categories and decision rules; by training the coders and showing that coding decisions made on a pilot sample have reached an acceptable level by other coders. The first two methods can be realised because this paper follows Gutheir & Petty (2000) and Abeysekera’s (2008) IC framework, which clearly defines every IC item. This paper used content analysis because the purpose of the analysis

was to count pre-determined IC items referred to in the annual reports using Nvivo software. The third technique is difficult to realise due to restrictions on the research domain because a conventional reliability test requires a measure of consensus between different coders, which is interpreted by a consensus coefficient. In coding data, another researcher could code the semantic content differently from that recorded in this thesis by this researcher. Abeysekera (2008) argued that this problem is not due to laxity or carelessness between researchers, but because of differences in objectively driven sensibility and creativity between them. The creative aspect is an accepted factor in semantic content analysis, unlike syntactic content analysis. Under semantic rules, words can express different concepts to different people, and since there is no natural language that determines one interpretation of a sentence, a true or correct semantic investigation is directed towards building empirical knowledge rather than normative knowledge (Andren 1980, pp.60-63). According to Abeysekera (2008), the consensus coefficient has weaknesses in that it can cast doubt on reliable data if the coefficient is low and a high coefficient can seem trustworthy even if it is unreliable because there is a high frequency of false data. A more qualified reliability test can involve several others by re-coding a random sample of investigated material to identify differences so that an ordinary coefficient can be calculated. However, this method is time consuming and costly. Given the above limitations, a sole researcher's judgment should be trusted because it seems to be the only feasible way of measuring the veracity of data concerning semantic content (Andren 1980, pp.65-66). Therefore, this study does not require another coder to re-capture IC using content analysis, however after capturing the IC data, the author of this study has reviewed the coded IC items twice, and there is a one week interval between first time coding and second time reviewing.

4.4.2 Empirical models

4.4.2.1 IC and firm's financial performance (H8)

There is at present no specific theoretical perspective or adequate empirical evidence that supports the superiority of any specific proxy financial performance measure (Ghosh & Mondal, 2009), in fact a study found that firm productivity relies more on its IC and system capabilities than its hard assets, and a firm with higher IC disclosure is expected to have higher rate of profitability and may also experience higher productivity (Patton, 2007). Therefore, financial performance in this paper is measured by productivity and profitability.

Profitability shows the operating success of an entity for a given period of time; it is a measure of the degree to which revenues exceed costs, and is frequently used as the ultimate test of management's operating effectiveness (Chen et al., 2005). Three commonly used measures in literature are applied in this paper; return on assets (ROA), return on equity (ROE), and revenue growth (RG).

$$\text{Return on assets (ROA)} = \text{Earnings before tax} / \text{Average total assets} \quad (15)$$

$$\text{Return on equity (ROE)} = \text{Earnings before tax} / \text{Average shareholders' equity} \quad (16)$$

$$\text{Revenue growth (RG)} = (\text{Current total revenue} - \text{prior year revenue}) / \text{Prior year revenue} \quad (17)$$

ROE is generally considered by investors to be an important indicator of financial profitability because it shows how much profit was earned for each dollar invested by the owners. ROA reflects firms' efficiency in utilising total assets by measuring the overall profitability of assets in terms of the rate earned on each dollar invested in assets, while RG measures changes in firms' revenues. Increases in revenues usually signal opportunities for growth (Chen et al, 2005).

Productivity measures the efficiency with which ability firm convert inputs into outputs; the most frequently used measurement of productivity in literature is the ratio of revenue-to-assets.

$$\text{Revenue-to-assets ratio (ATO)} = \text{Total revenue} / \text{Average total assets} \quad (18)$$

ATO is used to compare how much in assets a company has relative to the amount of revenues it can generate using their assets; basically, the higher the ratio, the smaller the investment needed to generate revenue (Kamath, 2008).

Empirical model for H8:

$$\text{Financial performance measurements}_{j,t,t+1,t+2} = a_1 \text{IC}_{j,t} / \text{HIC}_{j,t} + a_2 \text{Controls}_{j,t} + \text{Year effects} + \text{Industry effects} + e_{j,t} \quad (19)$$

Where: j-firm observations, t-years from 2009 to 2012.

Financial performance is measured by ROA, ROE, RG and ATO for firm j, in year t, in year t+1, and in year t+2, respectively;

$\text{IC}_{j,t}$ —the sum of natural logarithm of frequency counts of internal capital, external capital, and human capital for firm j, in year t.

$\text{HIC}_{j,t}$ —dummy variable where each year is ranked on IC and the upper quartile of IC is selected as sufficient IC disclosure and coded as one, or zero otherwise. Sufficient IC disclosure is also included as an independent variable because this paper assumes it is more observable and better at influencing investors' perceptions.

4.4.2.2 Control variables for financial performance

This paper includes several variables that are known to influence financial performance and IC disclosure. They are: leverage ratio, firm size, corporate governance, industry effects and year effects.

Leverage ratio: firms that rely heavily on debt may lack the security needed to attract investors, and will likely have higher interest payments that reflect on their riskiness and returns (Clarke et al., 2011). Researchers argued that lenders may represent influential shareholders with increasing debt to equity ratios to monitor IC investments (Firer & Williams, 2003; Dignam & Galanis, 2009; Abeysekera, 2011), so firms may be forced to disclose their IC more actively. Consistent with prior research, this paper includes the leverage ratio ($\text{Leverage}_{j,t}$) as a control variable measured by short-term and long-term debt divided by total assets for firm j , in year t .

Firm size: agency theory predicts that larger firms will disclose more information to mitigate any potential transfers of wealth from suppliers of outside capital to managers (Jensen & Meckling, 1976; Leftwich et al., 1981; Garcia-Meca et al., 2005). Studies found that firm size may positively influence IC value due to advantageous access to resources and market power (Youndt et al., 2004; Reed et al., 2006; Goebel, 2015). Guthrie et al. (2006) found that, on average, large Australian companies have a higher level of disclosure than small companies, so firm size ($\text{Size}_{j,t}$) is included as a control variable measured by the natural logarithm of total assets for firm j , at the beginning of year t .

Corporate governance: Keenan & Aggestam (2001) were the first to investigate the relationship between corporate governance and IC. They argued that the responsibility for prudent investment of IC resides with corporate governance. Li et al. (2008) examined the

relationship between corporate governance structure and IC disclosure of UK listed firms and found that board composition, ownership structure, the size of an audit committee and frequency of committee meetings have a significantly positive relationship with IC disclosure, while dual roles were insignificant. Safieddine et al., (2009) examined the relationship between IC and corporate governance in a university setting and concluded that corporate governance and IC are indeed related and corporate governance is a major factor attracting IC in a firm. Abidin et al., (2009) conducted a study in Malaysia and found evidence of a positive link between large board size and IC performance, and also showed a positive link between the number of non-executive directors and IC. Zamani et al., (2012) studied the association between three board characteristics (board size, independent directors, and role duality) and IC efficiency by using VAICTM in the Tehran Security Exchange, and concluded there was a positive link between them. Muttakin et al. (2015) examined the relationship between corporate governance and the extent to which Bangladeshi firms disclose IC and found that foreign ownership, board independence, and the presence of audit committees are positively associated with the extent of IC disclosure. Conversely, family duality (where the positions of CEO and chairperson are occupied by two individuals from the same family) is negatively associated with the extent of IC disclosure. According to Gillan (2006), two measures of corporate governance, the percentage of independent directors on the board of directors and the percentage of shares held by institutions, are two important measures used to capture the mechanisms of corporate governance. Thus this paper includes the percentage of independent directors ($IND_{j,t}$) and the percentage of shares held by institutions ($PIST_{j,t}$) for firm j , in year t as proxies for the corporate governance as control variables³².

³² The financial data used in this paper were captured from DatAnalysis database available on the University of Wollongong website. The corporate governance data were collected from corporate governance section and shareholder information section of annual reports.

As with papers one and two, paper three controls the year and industry effects in Equation (19). 3 dummy variables were generated (year 2010=1, and others zero; year 2011=1, and others zero; year 2012=1, and others zero) to control for the unobservable confounding variables that differ from time to time, but are constant across the industries. Year 2009 was dropped by Stata software because the fixed-effects model included a constant. For industry effects, 7 dummy variables were generated (energy=1, and others zero; materials =1, and others zero; industrials=1, and others zero; health care=1, and others zero; software & services=1, and others zero; telecommunication services=1, and others zero; utilities=1, and others zero) to control for the unobservable confounding variables that differ across industries, but are constant over time. Consumer discretionary was dropped by Stata software because the fixed-effects model included a constant.

4.4.2.3 Value relevance of IC (H9)

Chapter two and section 2.4.5 discussed three value relevance models (including the balance sheet model, the earnings model, and Ohlson's (1995) model). Of these, Ohlson's (1995) model is widely used in the literature (Holthausen & Watts, 2001). Several studies have examined the value relevance of accounting information based on Ohlson's (1995) model, and included voluntary disclosure in the model (e.g., Vafaei, 2011; Kim & Taylor, 2014; Ferraro & Veltri, 2011). Lundholm & Myers (2002) measured the disclosure activities of firms by rating the published reports of the Association for Investment Management Research (AIMR), and found that increasing firms' discretionary disclosure activities would bring credible and relevant information about future earnings into the current market place, which then increases the stock price. Their model is based on the residual income valuation model where they characterised the current annual stock return as the sum of unexpected current earnings and the cumulative change in expectations about future earnings and noise. These

researchers used the level of current earnings and past year's earnings as proxy for unexpected current earnings where the proxy for changes in expected future earnings is central to the model. As future earnings have expected and unexpected components, the unexpected component to future earnings is an error in measurement when the realised future earnings are used as proxy for expected future earnings. Future stock returns are included to control for measurement errors in the model because they believe an unexpected shock to future earnings should also generate future returns. The measurement error (future returns) should not be associated with current returns in a regression by excluding future earnings, nor should it be negatively associated with current returns in the model. By extending the model, their study assumes that a significant source of changing expectations about a firm's future performance is disclosure activity by the firm itself. If a firm reveals news relevant to its future earnings through its disclosure activity, then realised future earnings will be reflected in current returns, albeit with some measurement error. Thus, they included the interaction effect between future earnings and the level of a firm's disclosure activity on stock returns as an interested variable, and thus the interaction between future earnings and voluntary disclosure activity is labelled as 'revealed future earnings'. From this the researchers found a positive relationship between 'revealed earnings' and stock returns. Abeysekera (2011b) extended Lundholm & Myers (2002)'s study to examine whether IC would bring future earnings forward to current stock prices in the civil war period in Sri Lanka and found that people often lost confidence due to future economic performances during this period so they did not include IC in the current price.

Lundholm & Myers (2002) is more appropriate to examine the market value relevance of IC because this paper attempts to consider whether IC would bring information regarding a firm's future earnings into current stock returns. Collins et al. (1994) and Lundholm & Myers (2002) found that accounting based earnings beyond three years have little explanatory power

so this study regards future earnings as the sum of three years of future accounting based earnings for each current year (investigation year) of the sample. Following Lundholm & Myers (2002) assertion, this study does not predict the coefficient on IC disclosure or sufficient IC disclosure itself, but does include it in the regression model because it is part of the interaction terms. If IC disclosure or sufficient IC disclosure is excluded, the interaction terms could inadvertently proxy for the level of disclosure so the interested variable for the H9 model is the interaction between IC disclosure or sufficient IC disclosure, and future earnings (i.e., the ‘revealed earnings’).

This study applies the Lundholm & Myers (2002)’s model as follow to test H9:

$$\begin{aligned}
 R_{j,t} = & a_1 E_{j,t-1} + a_2 E_{j,t} + a_3 E_{j,t+1to3} + a_4 R_{j,t+1to3} + a_5 IC_{j,t}/HIC_{j,t} + a_6 IC_{j,t} * E_{j,t-1}/HIC_{j,t} * E_{j,t-1} + \\
 & a_7 IC_{j,t} * E_{j,t}/HIC_{j,t} * E_{j,t} + a_8 IC_{j,t} * E_{j,t+1to3}/HIC_{j,t} * E_{j,t+1to3} + a_9 IC_{j,t} * R_{j,t+1to3}/HIC_{j,t} * R_{j,t+1to3} + a_{10} \\
 & Controls_{j,t} + Year\ effects + Industry\ effects + e_{j,t}
 \end{aligned} \tag{20}$$

Where: j is firm observations. t is years from 2009 to 2012.

$R_{j,t}$ - the annual stock returns for firm j, year t, measured by the natural logarithm of stock price three months³³ after year end t/ stock price three months after year end t-1;

$IC_{j,t}$ - the sum of natural logarithm of frequency counts of internal capital, external capital, and human capital for firm j, in year t.

$HIC_{j,t}$ - dummy variable where each year is ranked on IC and then the upper quartile of IC is selected as sufficient IC disclosure and coded as one, and zero otherwise.

³³ Following the prior studies (Yu et al., 2015; Swartz et al., 2006; Ferraro & Veltri, 2011), this study measures the firm’s stock price three months after year end, as it takes that period for annual reports to be released and inform shareholders about reported accounting profit in annual reports. This study uses stock return rather than the stock price as a measure to standardize across firms to investigate the market reactions on IC.

$E_{j,t-1}$ - earnings before tax for firm j, in year t-1, deflated by the market capitalisation at beginning of year t for firm j;

$E_{j,t}$ - earnings before tax for firm j, in year t, deflated by market capitalisation at the beginning of year t for firm j;

$E_{j,t+1to3}$ - the sum of earnings before tax for firm j, in years t+1, t+2, and t+3, deflated by market capitalisation at the beginning of year t for firm j;

$R_{j,t+1to3}$ - the sum of annual stock returns for firm j, in years t+1, t+2, and t+3, over a 12 month period beginning on the first day of the third month of the given year and ending on the last day of the second month of the subsequent year;

$IC_{j,t} * E_{j,t-1} / HIC_{j,t} * E_{j,t-1}$ - interaction of IC disclosure or sufficient IC disclosure for firm j, in year t and earnings before tax for firm j, in year t-1, deflated by market capitalisation at the beginning of year t for firm j;

$IC_{j,t} * E_{j,t} / HIC_{j,t} * E_{j,t}$ - interaction of IC disclosure or sufficient IC disclosure for firm j, in year t and earnings before tax for firm j, in year t, deflated by market capitalisation at the beginning of year t for firm j;

$IC_{j,t} * E_{j,t+1to3} / HIC_{j,t} * E_{j,t+1to3}$ - interaction of IC disclosure or sufficient IC disclosure for firm j, in year t and earnings before tax for firm j, in years t+1, t+2, and t+3, deflated by market capitalisation at beginning of year t for firm j;

$IC_{j,t} * R_{j,t+1to3} / HIC_{j,t} * R_{j,t+1to3}$ - interaction of IC disclosure or sufficient IC disclosure for firm j, in year t and sum of annual stock returns for firm j, in years t+1, t+2, and t+3, over a 12 month period beginning on the first day of the third month of the given year and ending on the last day of the second month of the subsequent year.

4.4.2.4 Control variables for value relevance of IC

Previous studies identified several variables that influence current stock returns, while others found that firms with a higher rate of growth have higher earnings potential and are more likely to disclose a higher level of IC to inform investors about future earnings (Swinson, 1998, p.4; Abeysekera, 2011); the market-to-book ratio ($MtoB_{j,t}$) is included to control for firm growth, measured as market value of equity divided by the book value of equity for firm j , in year t . Studies also found that IC resources have a longer operating cycle and are realised as earnings over a longer period (Warfield & Wild, 1992), firm's operating cycle ($Opcycle_{j,t}$) is included as a control variable, measured as natural logarithm of days of accounts receivable plus days of inventory for firm j , in year t . Firm size can influence a firm's discretionary disclosure practices, where larger firms are more visible and there is greater public demand for information beyond the statutory disclosure limits (Nagar et al., 2003). However, other studies found that large firms have difficulty in transforming future earnings into current earnings (Jensen & Meckling, 1976). Firm size ($Mktcap_{j,t}$) measured by the natural logarithm of market capitalisation of a firm, and is included as control variables³⁴. As with the empirical Equation (19) for H8, Equation (20) controls the year and industry effects.

4.4.2.5 IC and opportunistic underlying earnings reporting (H10)

Since paper one and two of this thesis found that underlying earnings are manipulated by managers as an earnings management tool that is perceived to be less detectable and is an effective technique to influence investors' perceptions of firm performance, this thesis developed the following empirical model to examine H10:

³⁴ The firm size is measured by logarithm of market capitalisation rather than total assets as the value relevance of IC is examined underpinning market context.

$$IC_{j,t}/HIC_{j,t}=a_1InEx_{j,t}+a_2Controls_{j,t}+Year\ effects + Industry\ effects + e_{j,t} \quad (21)$$

Where: j is firm observations. t is years from 2009 to 2012.

$IC_{j,t}$ - the sum of natural logarithm of frequency counts of internal capital, external capital, and human capital for firm j, in year t.

$HIC_{j,t}$ - dummy variable where each year is ranked on IC and then the upper quartile of IC is selected as sufficient IC disclosure and coded as one, or zero otherwise.

$InEx_{j,t}$ - income-increasing underlying earnings exclusions, which is measured by a dummy variable that equals 1 if j firm discloses a underlying earnings number greater than the statutory earnings in year t, and zero otherwise.

Control variables: except the general control variables in Equation (19) for H8, control variables in Equation (21) for H10 also include the specific control variables for opportunistic underlying earnings reporting that were examined in paper one. The specific control variables for opportunistic underlying earnings reporting are $Meet_{j,t}$ and $Loss_{j,t}$. Where $Meet_{j,t}$ is a dummy variable that equals 1 if j firm's earnings before tax in year t is greater or equals to earnings before tax in year t-1, and zero otherwise. $Loss_{j,t}$ is a dummy variable that equals 1 if j firm made statutory losses in year t, and zero otherwise.

4.5 Analyses and Results

4.5.1 Descriptive statistics of variables for paper three

Table 21 presents the descriptive statistics for IC and the disclosures of its three categories, and shows that while every firm reported some aspect of their IC capital (minimum=2), the

extent of reporting varied greatly (standard deviation=8.917)³⁵. The mean (21.033) and median (20) are high enough. Of the three IC categories, human capital presents the highest mean (9.926) and highest median (10.000), while the descriptive statistics suggest there is an increasing awareness of the importance of IC, especially for human capital, among ASX 200 firms, and firms have increased their commitment to communicate information about their IC to external stakeholders.

Table 21: Descriptive statistics for IC and its three categories

Variables	Obs.	Mean	Median	Std. Dev.	Min	Max
IC _{j,t}	610	21.033	20.000	8.917	2.000	66.000
INC _{j,t}	610	4.752	4.000	3.501	0.000	19.000
EC _{j,t}	610	6.354	6.000	4.498	0.000	34.000
HC _{j,t}	610	9.926	10.000	4.753	0.000	28.000

Note: INC_{j,t} is frequency counts of internal capital for firm j, in year t. EC_{j,t} is frequency counts of external capital for firm j, in year t. HC_{j,t} is frequency counts of human capital for firm j, in year t. IC_{j,t} is the sum of frequency counts of internal capital, external capital, and human capital for firm j, in year t.

4.5.2 Frequency of reporting specific IC attributes

Table 22 shows the popularity of the reporting specific IC items. As table 22 shows, the two items disclosed most are ‘management processes’ under the internal capital category (reporting frequency=874) and ‘business collaborations’ with other partners under the external capital category (reporting frequency=863). ‘Management processes’ is most important, which is not surprising because it is principally concerned with relations between people, and is a common way of conducting business that leads to objectives being

³⁵ It can be seen that IC reporting has wide range among the sample firms. Therefore, this paper takes the natural logarithm of IC disclosure in the regression models to standardise the IC values and avoid the influence of outliers.

accomplished. 'Business collaborations' is next because alliances and other forms of collaborative arrangements are important means of implementing firm's growth strategies (Guthrie et al., 2006). The third most reported IC item is 'know-how' (reporting frequency=794). This is a human capital item that shows how much knowledge an employee possesses about a particular topic (Brooking, 1996, pp.51-51); it includes skills and knowledge, or skills used to accomplish jobs or the work related knowledge needed to do a job in terms of tacit, explicit, and implicit knowledge (Li et al., 2008). The least reported item is 'franchising agreements', which only hits 58 reporting frequency counts among the 33 IC items.

Table 22: The frequency counts of individual IC items

IC items	Frequency counts
<i>Internal capital</i>	2899
Intellectual property	327
Management processes	874
Technological processes	622
Information systems	213
Network systems	72
Management philosophy	383
Corporate culture	304
Financial relations	104
<i>External capital</i>	3876
Brands	665
Customer satisfaction	152
Quality standards	186
Company names	87
Favourable contracts	731
Business collaborations	863
Licensing agreements	366
Franchising agreements	58
Distribution channels	159
Market share	299
Favourable relations with stakeholders	310
<i>Human capital</i>	6055
Employee involvement in the community	266
Employee thanked	543
Employee featured	417
Employee numbers	394
Professional experience	556
Value added by employee	76
Know-how	794
Education	587

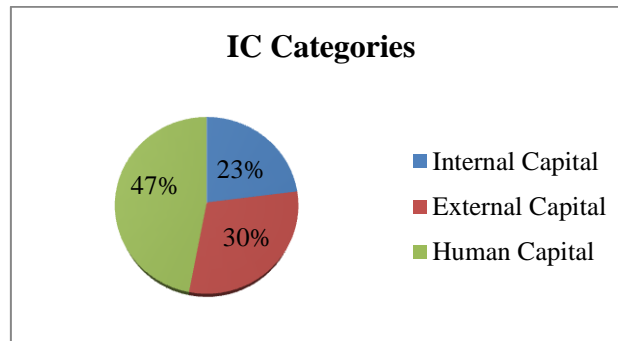
Table 22: The frequency counts of individual IC items (continued)	
IC items (Human capital continued)	Frequency counts
Career development	104
Training programmers	267
Entrepreneurial spirit, innovativeness, proactive and reactive abilities and changeability	507
Employment safety	781
Employee diversity	513
Employee welfare	250

4.5.3 Relative emphasis in terms of IC categories

The frequency of reporting by categories of IC (including internal capital, external capital, and human capital) is to determine whether there is a particular focus on one particular category of capital. Figure 8 shows the relative emphasis in terms of IC categories. Reporting human capital appears to be more in favour with 47% of total IC disclosure, followed by external capital which accounts for 30% of total IC disclosure. Reporting internal capital seems to be less in favour with 23% compare to the other two categories. Human capital is emphasized in the light of an emphasis in recent years with increased global competition, so talented people are once more a priority. The increasing awareness of safety issues may also account for this emphasis on human capital, because most ASX200 firms now provide a safety and sustainability section in their annual reports. The reporting frequency of employment safety is 781, which is the second highest item reported in the human capital category. Moreover, an increasing number of firms reported the diversity of their employees (reporting frequency=513) based on ASX best practice recommendations 3.2, 3.3, 3.4 & 3.5 in corporate governance statement section 4 of annual reports. This increased reporting of human capital may also arise from an increase in employee relations. Most firms (reporting frequency=543) thanked their staff in the Chairman's report section of annual reports and

also attempted to give special prominence to and reward employees, as shown in the high reporting frequency in employee featured (reporting frequency=417) item.

Figure 8: The relative emphasis in terms of IC categories



4.5.4 Pearson and Spearman correlations of variables for paper three

4.5.4.1 Pearson and Spearman correlations for three individual IC categories

Table 23 panel A presents the results of pearson and spearman correlations between IC, external capital, human capital, and internal capital, and shows that internal capital, external capital, and human capital, are significantly and positively correlated to each other. All three individual categories are highly correlated to total IC disclosure. Table 23 panel B shows the factor analysis of three individual categories, while in panel B, internal capital, external capital, and human capital are represented by one factor. The panel A and panel B results of table 23 indicate that by making the total of three individual categories represent total IC disclosure is appropriate in this paper.

Table 23: The relations between IC and its three categories

Table 23 Panel A: Pearson and spearman correlations for IC variables				
	INC _{j,t}	EC _{j,t}	HC _{j,t}	IC _{j,t}
INC _{j,t}	1.000	0.238*** (0.000)	0.130*** (0.001)	0.582*** (0.000)
EC _{j,t}	0.278*** (0.000)	1.000	0.295*** (0.000)	0.755*** (0.000)
HC _{j,t}	0.158*** (0.000)	0.275*** (0.000)	1.000	0.733*** (0.000)
IC _{j,t}	0.577*** (0.000)	0.742*** (0.000)	0.727*** (0.000)	1.000

Table 23 Panel B: Factor analysis				
Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	0.548	0.602	1.963	1.963
Factor2	-0.054	0.161	-0.193	1.770
Factor3	-0.215	0.000	-0.770	1.000
Number of obs	610			
Retained factors	1			
Number of params	3			
chi2(3)	93.45			
Prob>chi2	0			

Factor loadings (pattern matrix) and unique variances		
Variable	Factor1	Uniqueness
INC _{j,t}	0.354	0.875
EC _{j,t}	0.496	0.754
HC _{j,t}	0.420	0.823

p-value in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Pearson (spearman) correlations are presented above (below)

Note: INC_{j,t} is frequency counts of internal capital for firm j, in year t. EC_{j,t} is frequency counts of external capital for firm j, in year t. HC_{j,t} is frequency counts of human capital for firm j, in year t. IC_{j,t} is the sum of frequency counts of internal capital, external capital, and human capital for firm j, in year t.

4.5.4.2 Pearson and Spearman correlations for financial performance variables

Table 24 panel A presents the pearson and spearman correlations for five traditional financial performance variables with IC disclosure. Table 24 shows that IC disclosure ($IC_{j,t}$) and sufficient IC disclosure ($HIC_{j,t}$) are positively and significantly correlated to each current profitability measurements ($ROE_{j,t}$, $ROA_{j,t}$ and $RG_{j,t}$), and the productivity measurements ($ATO_{j,t}$) and traditional market valuation measurement ($MtoB_{j,t}$). Moreover, $IC_{j,t}$ and $HIC_{j,t}$ are found positively and significantly correlated to future profitability measurements ($ROE_{j,t+1}$, $ROE_{j,t+2}$, $ROA_{j,t+1}$, $ROA_{j,t+2}$, $RG_{j,t+1}$ and $RG_{j,t+2}$), future productivity measurements ($ATO_{j,t+1}$ and $ATO_{j,t+2}$), and future traditional market valuation measurements ($MtoB_{j,t+1}$ and $MtoB_{j,t+2}$). These correlation results provide the first sight that IC disclosure or sufficient IC disclosure can enhance current and future financial performance, and also help firms disclose information regarding their potential financial performance.

Table 24 panel B shows the pearson and spearman correlations for value relevance variables where in general, $E_{j,t-1}$, $E_{j,t}$, and $E_{j,t+1to3}$ are positively correlated to each other, indicating that past accounting-based earnings guided present and future accounting-based earnings (Abeysekera, 2011b). $IC_{j,t} * E_{j,t+1to3}$ is positively correlated to $R_{j,t}$ for spearman correlation (correlation=0.223, p-value=0.000) and pearson correlation (correlation=0.196, p-value=0.000), respectively. $HIC_{j,t} * E_{j,t+1to3}$ is positively correlated to $R_{j,t}$ with correlation 0.092, p-value 0.028 for spearman correlation and with correlation 0.185, p-value 0.000 for pearson correlation. These positive correlations suggest that IC disclosure and sufficient IC disclosure may bring future earnings forward to current stock price, that is, the market would believe that firms with IC disclosure and sufficient IC disclosure reflect future financial benefits and thus react favourably to such disclosure.

Table 24: Pearson and spearman correlations for financial performance measurements

Table 24 Panel A: Pearson and spearman correlations for financial performance measurements

	IC _{jt}	HIC _{jt}	ROE _{jt}	ROE _{jt+1}	ROE _{jt+2}	ROA _{jt}	ROA _{jt+1}	ROA _{jt+2}	RG _{jt}	RG _{jt+1}	RG _{jt+2}	ATO _{jt}	ATO _{jt+1}	ATO _{jt+2}	MtoB _{jt}	MtoB _{jt+1}	MtoB _{jt+2}
IC _{jt}	1.000	0.815*** (0.000)	0.110*** (0.006)	0.122*** (0.003)	0.081** (0.047)	0.102** (0.012)	0.122*** (0.003)	0.124*** (0.002)	0.093** (0.022)	0.086** (0.035)	0.090** (0.027)	0.202*** (0.000)	0.188*** (0.000)	0.179*** (0.000)	0.085** (0.036)	0.122*** (0.003)	0.177*** (0.000)
HIC _{jt}	0.866*** (0.000)	1.000	0.098** (0.016)	0.134*** (0.001)	0.061 (0.137)	0.088** (0.030)	0.097** (0.017)	0.132*** (0.001)	0.090** (0.026)	0.084** (0.039)	0.099** (0.015)	0.126*** (0.002)	0.131*** (0.001)	0.132*** (0.001)	0.069* (0.090)	0.104** (0.010)	0.169*** (0.000)
ROE _{jt}	0.155*** (0.000)	0.126*** (0.002)	1.000	0.402*** (0.000)	-0.083** (0.041)	0.880*** (0.000)	0.509*** (0.000)	0.191*** (0.000)	0.053 (0.193)	0.023 (0.570)	0.031 (0.444)	0.231*** (0.000)	0.216*** (0.000)	0.191*** (0.000)	0.170*** (0.000)	0.228*** (0.000)	0.199*** (0.000)
ROE _{jt+1}	0.177*** (0.000)	0.140*** (0.001)	0.776*** (0.000)	1.000	0.287*** (0.000)	0.220*** (0.000)	0.413*** (0.000)	0.377*** (0.000)	0.027 (0.500)	0.037 (0.363)	0.023 (0.567)	0.192*** (0.000)	0.216*** (0.000)	0.217*** (0.000)	0.170*** (0.000)	0.290*** (0.000)	0.387*** (0.000)
ROE _{jt+2}	0.186*** (0.000)	0.142*** (0.001)	0.600*** (0.000)	0.749*** (0.000)	1.000	-0.107*** (0.008)	0.005 (0.901)	0.118*** (0.004)	-0.007 (0.863)	0.022 (0.591)	0.027 (0.510)	0.124*** (0.002)	0.055 (0.177)	0.109*** (0.007)	0.096** (0.018)	0.291*** (0.000)	0.240*** (0.000)
ROA _{jt}	0.138*** (0.001)	0.111*** (0.006)	0.957*** (0.000)	0.753*** (0.000)	0.578*** (0.000)	1.000	0.602*** (0.000)	0.251*** (0.000)	0.074* (0.069)	0.029 (0.469)	0.043 (0.296)	0.307*** (0.000)	0.277*** (0.000)	0.244*** (0.000)	0.204*** (0.000)	0.177*** (0.000)	0.107*** (0.009)
ROA _{jt+1}	0.122*** (0.003)	0.089** (0.028)	0.736*** (0.000)	0.885*** (0.000)	0.658*** (0.000)	0.736*** (0.000)	1.000	0.533*** (0.000)	0.050 (0.222)	0.047 (0.244)	0.029 (0.482)	0.289*** (0.000)	0.325*** (0.000)	0.272*** (0.000)	0.161*** (0.000)	0.187*** (0.000)	0.149*** (0.000)
ROA _{jt+2}	0.144*** (0.000)	0.111*** (0.006)	0.585*** (0.000)	0.715*** (0.000)	0.862*** (0.000)	0.584*** (0.000)	0.753*** (0.000)	1.000	0.002 (0.955)	0.076** (0.060)	0.051 (0.212)	0.191*** (0.000)	0.309*** (0.000)	0.323*** (0.000)	0.159*** (0.000)	0.234*** (0.000)	0.246*** (0.000)
RG _{jt}	0.089** (0.028)	0.079* (0.051)	0.211*** (0.000)	0.201*** (0.000)	0.104** (0.011)	0.236*** (0.000)	0.175*** (0.000)	0.083** (0.041)	1.000	-0.300*** (0.000)	0.062 (0.126)	0.087** (0.032)	0.078* (0.055)	0.057 (0.163)	0.001 (0.985)	-0.049 (0.223)	-0.017 (0.675)
RG _{jt+1}	0.120*** (0.003)	0.102** (0.012)	0.053 (0.195)	0.195*** (0.000)	0.198*** (0.000)	0.062 (0.130)	0.211*** (0.000)	0.197*** (0.000)	0.207*** (0.000)	1.000	-0.213*** (0.000)	0.028 (0.489)	0.048 (0.232)	0.052 (0.204)	0.014 (0.732)	0.026 (0.529)	-0.019 (0.643)
RG _{jt+2}	0.121***	0.097**	0.097***	0.082**	0.217***	0.097**	0.070*	0.251***	0.092**	0.237***	1.000	0.040	0.025	0.046	0.022	0.020	0.032

Table 24 Panel A: Pearson and spearman correlations for financial performance measurements (continued)

	IC _{j,t}	HIC _{j,t}	ROE _{j,t}	ROE _{j,t+1}	ROE _{j,t+2}	ROA _{j,t}	ROA _{j,t+1}	ROA _{j,t+2}	RG _{j,t}	RG _{j,t+1}	RG _{j,t+2}	ATO _{j,t}	ATO _{j,t+1}	ATO _{j,t+2}	MtoB _{j,t}	MtoB _{j,t+1}	MtoB _{j,t+2}
	(0.003)	(0.017)	(0.017)	(0.044)	(0.000)	(0.017)	(0.084)	(0.000)	(0.024)	(0.000)		(0.325)	(0.547)	(0.257)	(0.594)	(0.617)	(0.428)
ATO _{j,t}	0.119***	0.081**	0.523***	0.454***	0.393***	0.564***	0.439***	0.357***	0.264***	0.109***	0.126***	1.000	0.874***	0.809***	0.008	0.028	0.113***
	(0.003)	(0.046)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.002)		(0.000)	(0.000)	(0.839)	(0.489)	(0.006)
ATO _{j,t+1}	0.112***	0.089**	0.450***	0.491***	0.414***	0.481***	0.475***	0.398***	0.227***	0.216***	0.096**	0.900***	1.000	0.855***	-0.004	0.038	0.098**
	(0.006)	(0.029)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.018)	(0.000)		(0.000)	(0.915)	(0.351)	(0.016)
ATO _{j,t+2}	0.107***	0.094**	0.399***	0.432***	0.456***	0.424***	0.397***	0.435***	0.178***	0.189***	0.197***	0.832***	0.911***	1.000	-0.023	0.008	0.087**
	(0.009)	(0.021)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.576)	(0.847)	(0.031)
MtoB _{j,t}	0.084**	0.061	0.361***	0.404***	0.325***	0.373***	0.386***	0.318***	0.016	0.068*	0.021	0.129***	0.109***	0.062	1.000	0.739***	0.523***
	(0.039)	(0.132)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.703)	(0.093)	(0.609)	(0.001)	(0.007)	(0.129)		(0.000)	(0.000)
MtoB _{j,t+1}	0.130***	0.100**	0.351***	0.475***	0.482***	0.343***	0.403***	0.453***	-0.026	0.085**	0.072*	0.142***	0.168***	0.131***	0.789***	1.000	0.774***
	(0.001)	(0.014)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.521)	(0.037)	(0.076)	(0.001)	(0.000)	(0.001)	(0.000)		(0.000)
MtoB _{j,t+2}	0.183***	0.153***	0.365***	0.463***	0.558***	0.355***	0.339***	0.475***	0.011	0.040	0.088**	0.191***	0.193***	0.200***	0.570***	0.813***	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.793)	(0.330)	(0.030)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

* p<0.10, ** p<0.05, *** p<0.01

Table 24: Pearson and spearman correlations for financial performance measurements (continued)

Table 24 Panel B: Pearson and spearman correlations for value relevance variables

	$R_{j,t}$	$E_{j,t-1}$	$E_{j,t}$	$E_{j,t+1103}$	$R_{j,t+1103}$	$IC_{j,t}$	$IC_{j,t} * E_{j,t-1}$	$IC_{j,t} * E_{j,t}$	$IC_{j,t} * E_{j,t+1103}$	$IC_{j,t} * R_{j,t+1103}$	$HIC_{j,t}$	$HIC_{j,t} * E_{j,t-1}$	$HIC_{j,t} * E_{j,t}$	$HIC_{j,t} * E_{j,t+1103}$	$HIC_{j,t} * R_{j,t+1103}$
$R_{j,t}$	1.000	-0.146*** (0.000)	-0.086** (0.035)	0.187*** (0.000)	0.082** (0.050)	-0.007 (0.864)	-0.158*** (0.000)	-0.081** (0.046)	0.196*** (0.000)	0.098** (0.018)	-0.002 (0.959)	-0.062 (0.128)	-0.052 (0.199)	0.185*** (0.000)	0.078* (0.063)
$E_{j,t-1}$	-0.123*** (0.003)	1.000	0.792*** (0.000)	0.065 (0.107)	0.005 (0.914)	-0.034 (0.403)	0.969*** (0.000)	0.704*** (0.000)	0.021 (0.608)	0.006 (0.886)	-0.016 (0.690)	0.290*** (0.000)	0.125*** (0.002)	0.131*** (0.001)	0.009 (0.824)
$E_{j,t}$	0.074* (0.077)	0.643*** (0.000)	1.000	0.239*** (0.000)	-0.003 (0.942)	-0.024 (0.554)	0.738*** (0.000)	0.952*** (0.000)	0.202*** (0.000)	-0.010 (0.811)	-0.032 (0.432)	0.160*** (0.000)	0.414*** (0.000)	0.094** (0.021)	-0.034 (0.417)
$E_{j,t+1103}$	0.247*** (0.000)	0.409*** (0.000)	0.571*** (0.000)	1.000	0.177*** (0.000)	-0.044 (0.280)	0.021 (0.607)	0.207*** (0.000)	0.984*** (0.000)	0.152*** (0.000)	-0.054 (0.182)	0.070* (0.086)	0.037 (0.362)	0.170*** (0.000)	0.057 (0.169)
$R_{j,t+1103}$	0.044 (0.297)	0.034 (0.411)	0.055 (0.190)	0.373*** (0.000)	1.000	0.070* (0.095)	0.012 (0.771)	-0.007 (0.875)	0.179*** (0.000)	0.956*** (0.000)	0.072* (0.084)	0.040 (0.334)	-0.029 (0.481)	0.176*** (0.000)	0.602*** (0.000)
$IC_{j,t}$	-0.021 (0.616)	0.026 (0.532)	0.030 (0.472)	0.048 (0.253)	0.082** (0.050)	1.000	0.065 (0.107)	0.074* (0.069)	0.021 (0.598)	0.044 (0.288)	0.815*** (0.000)	0.290*** (0.000)	0.230*** (0.000)	0.310*** (0.000)	-0.027 (0.524)
$IC_{j,t} * E_{j,t-1}$	-0.153*** (0.000)	0.904*** (0.000)	0.568*** (0.000)	0.371*** (0.000)	0.060 (0.150)	0.343*** (0.000)	1.000	0.698*** (0.000)	-0.008 (0.853)	0.011 (0.791)	0.071* (0.081)	0.470*** (0.000)	0.216*** (0.000)	0.223*** (0.000)	0.011 (0.790)
$IC_{j,t} * E_{j,t}$	0.031 (0.464)	0.584*** (0.000)	0.904*** (0.000)	0.530*** (0.000)	0.077* (0.064)	0.353*** (0.000)	0.678*** (0.000)	1.000	0.190*** (0.000)	-0.019 (0.652)	0.049 (0.231)	0.266*** (0.000)	0.644*** (0.000)	0.171*** (0.000)	-0.052 (0.210)
$IC_{j,t} * E_{j,t+1103}$	0.223*** (0.000)	0.384*** (0.000)	0.531*** (0.000)	0.929*** (0.000)	0.357*** (0.000)	0.332*** (0.000)	0.468*** (0.000)	0.622*** (0.000)	1.000	0.164*** (0.000)	0.001 (0.973)	0.118*** (0.004)	0.073* (0.072)	0.271*** (0.000)	0.078* (0.061)
$IC_{j,t} * R_{j,t+1103}$	0.048 (0.250)	0.036 (0.395)	0.054 (0.193)	0.345*** (0.000)	0.985*** (0.000)	0.108** (0.010)	0.071* (0.090)	0.088** (0.035)	0.351*** (0.000)	1.000	0.041 (0.328)	0.034 (0.419)	-0.048 (0.253)	0.199*** (0.000)	0.764*** (0.000)
$HIC_{j,t}$	0.011	0.031	0.012	0.030	0.067	0.866***	0.298***	0.280***	0.261***	0.087**	1.000	0.373***	0.276***	0.386***	-0.080*

Table 24 Panel B: Pearson and spearman correlations for value relevance variables (continued)

	$R_{j,t}$	$E_{j,t-1}$	$E_{j,t}$	$E_{j,t+1to3}$	$R_{j,t+1to3}$	$IC_{j,t}$	$IC_{j,t} * E_{j,t-1}$	$IC_{j,t} * E_{j,t}$	$IC_{j,t} * E_{j,t+1to3}$	$IC_{j,t} * R_{j,t+1to3}$	$HIC_{j,t}$	$HIC_{j,t} * E_{j,t-1}$	$HIC_{j,t} * E_{j,t}$	$HIC_{j,t} * E_{j,t+1to3}$	$HIC_{j,t} * R_{j,t+1to3}$
	(0.787)	(0.463)	(0.775)	(0.477)	(0.109)	(0.000)	(0.000)	(0.000)	(0.000)	(0.038)		(0.000)	(0.000)	(0.000)	(0.055)
$HIC_{j,t} * E_{j,t-1}$	-0.097**	0.528***	0.322***	0.204***	0.089**	0.511***	0.738***	0.518***	0.359***	0.106**	0.591***	1.000	0.480***	0.544***	-0.007
	(0.020)	(0.000)	(0.000)	(0.000)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.012)	(0.000)		(0.000)	(0.000)	(0.876)
$HIC_{j,t} * E_{j,t}$	-0.014	0.314***	0.473***	0.270***	0.086**	0.579***	0.523***	0.691***	0.436***	0.104**	0.649***	0.781***	1.000	0.338***	-0.102**
	(0.736)	(0.000)	(0.000)	(0.000)	(0.039)	(0.000)	(0.000)	(0.000)	(0.000)	(0.013)	(0.000)	(0.000)		(0.000)	(0.014)
$HIC_{j,t} * E_{j,t+1to3}$	0.092**	0.223***	0.254***	0.403***	0.193***	0.689***	0.441***	0.477***	0.599***	0.220***	0.756***	0.690***	0.774***	1.000	0.205***
	(0.028)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)
$HIC_{j,t} * R_{j,t+1to3}$	0.060	0.016	0.033	0.151***	0.647***	0.066	0.042	0.060	0.174***	0.730***	0.035	0.064	0.073*	0.198***	1.000
	(0.152)	(0.703)	(0.426)	(0.000)	(0.000)	(0.114)	(0.312)	(0.149)	(0.000)	(0.000)	(0.398)	(0.127)	(0.083)	(0.000)	

p-value in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Pearson (spearman) correlations are presented above (below)

Note: $IC_{j,t}$ is the sum of natural logarithm of frequency counts of internal capital, external capital, and human capital for firm j , in year t . $HIC_{j,t}$ is dummy variable where each year is ranked on IC and then the upper quartile of IC is selected as sufficient IC disclosure and coded as one, zero otherwise. $ROE_{j,t}$, $ROE_{j,t+1}$ and $ROE_{j,t+2}$ are return on equity ratios measured by earnings before tax over average shareholders' equity for firm j , in year t , in year $t+1$ and in year $t+2$, respectively. $ROA_{j,t}$, $ROA_{j,t+1}$ and $ROA_{j,t+2}$ are return on assets ratios measured by earnings before tax over average total assets for firm j , in year t , in year $t+1$ and in year $t+2$, respectively. $RG_{j,t}$, $RG_{j,t+1}$ and $RG_{j,t+2}$ are revenue growth rates measured by changes of current total revenue and prior year revenue divided by prior year revenue for firm j , in year t , in year $t+1$ and in year $t+2$, respectively. $ATO_{j,t}$, $ATO_{j,t+1}$ and $ATO_{j,t+2}$ are revenue-to-assets ratios measured by total revenue over average total assets for firm j , in year t , in year $t+1$ and in year $t+2$, respectively. $MtoB_{j,t}$, $MtoB_{j,t+1}$ and $MtoB_{j,t+2}$ are market-to-book ratios measured as market value of equity divided by the book value of equity for firm j , in year t , in year $t+1$ and in year $t+2$, respectively. $R_{j,t}$ is the annual stock returns for firm j , year t , measured by natural logarithm of stock price three months after year end t / stock price three months after year end $t-1$. $E_{j,t-1}$ is earnings before tax for firm j , in year $t-1$, deflated by the market capitalisation at beginning of year t for firm j . $E_{j,t}$ is earnings before tax for firm j , year t , deflated by the market capitalisation at beginning of year t for firm j . $E_{j,t+1to3}$ is the sum of earnings before tax for firm j , years $t+1$, $t+2$, and $t+3$, deflated by the market capitalisation at beginning of year t for firm j . $R_{j,t+1to3}$ is the sum of annual stock returns for firm j , years $t+1$, $t+2$, and $t+3$, over the 12-month period beginning on the first day of the third month of the given year and ending on the last day of the second month of the subsequent year; $IC_{j,t} * E_{j,t-1} / HIC_{j,t} * E_{j,t-1}$ is interaction of IC disclosure or sufficient IC disclosure for firm j , in year t and earnings before tax for firm j , in year $t-1$, deflated by the market capitalisation at beginning of year t for firm j . $IC_{j,t} * E_{j,t} / HIC_{j,t} * E_{j,t}$ is interaction of IC disclosure or sufficient IC disclosure for firm j , in year t and earnings before tax for firm j , in year t , deflated by the market capitalisation at beginning of year t for firm j . $IC_{j,t} * E_{j,t+1to3} / HIC_{j,t} * E_{j,t+1to3}$ is interaction of IC disclosure or sufficient IC disclosure for firm j , year t and earnings before tax for firm j , the years $t+1$, $t+2$, and $t+3$, deflated by the market capitalisation at beginning of year t for firm j . $IC_{j,t} * R_{j,t+1to3} / HIC_{j,t} * R_{j,t+1to3}$ is interaction of IC disclosure or sufficient IC disclosure for firm j , year t and sum of annual stock returns for firm j , years $t+1$, $t+2$, and $t+3$, over the 12-month period beginning on the first day of the third month of the given year and ending on the last day of the second month of the subsequent year.

4.5.5 Results for IC and financial performance (H8)

Table 25 presents the results for H8 with profitability as the dependent variable using the year industry fixed-effects panel regressions. Table 25 panel A and panel B provide evidence for profitability with $ROE_{j,t}$, $ROE_{j,t+1}$, and $ROE_{j,t+2}$ as dependent variables³⁶. Table 25 panel A shows the results with $IC_{j,t}$ as an independent variable, while panel B shows the results with $HIC_{j,t}$ as an independent variable. As shown in panel A, $IC_{j,t}$ is positively and significantly associated with $ROE_{j,t}$ (coefficient=0.020, p-value=0.036), $ROE_{j,t+1}$ (coefficient=0.026, p-value=0.005), and $ROE_{j,t+2}$ (coefficient=0.022, p-value=0.091). Panel B shows that $HIC_{j,t}$ is positively and significantly associated with $ROE_{j,t}$ (coefficient=0.059, p-value=0.037), $ROE_{j,t+1}$ (coefficient=0.090, p-value=0.001) but $ROE_{j,t+2}$. Table 25 panel C and panel D provide evidence for profitability with $ROA_{j,t}$, $ROA_{j,t+1}$, and $ROA_{j,t+2}$ as dependent variables. Table 25 panel C shows the results with $IC_{j,t}$ as an independent variable, while panel D shows the results with $HIC_{j,t}$ as an independent variable. Panel C shows that $IC_{j,t}$ is significantly and positively related to $ROA_{j,t}$ (coefficient=0.016, p-value=0.073), $ROA_{j,t+1}$ (coefficient=0.011, p-value=0.008) and $ROA_{j,t+2}$ (coefficient=0.012, p-value=0.004). Similar results can be found in panel D where $HIC_{j,t}$ is significantly and positively related to $ROA_{j,t}$ (coefficient=0.050, p-value=0.062), $ROA_{j,t+1}$ (coefficient=0.027, p-value=0.028) and $ROA_{j,t+2}$ (coefficient=0.040, p-value=0.001). Table 25 panel E and panel F provide evidence for profitability with $RG_{j,t}$, $RG_{j,t+1}$, and $RG_{j,t+2}$ as dependent variables. Table 25 panel E shows the results with $IC_{j,t}$ as an independent variable, while panel F shows the results with $HIC_{j,t}$ as an independent variable. The results of panel E show that $IC_{j,t}$ is significantly and positively related to $RG_{j,t}$ (coefficient=0.051, p-value=0.061), $RG_{j,t+1}$ (coefficient=0.062, p-value=0.075) but $RG_{j,t+2}$. Similar results can be found in panel F where $HIC_{j,t}$ is significantly and positively related to $RG_{j,t}$ (coefficient=0.153, p-value=0.056), $RG_{j,t+1}$ (coefficient=0.179, p-value=0.082) and

³⁶ The number of observation decreased to 606 in 2014 as there were four firms deleted. They are Twenty-first Century Fox Inc; David Jones Limited; Aurora Oil & Gas Limited; Aquila Resources Limited.

$RG_{j,t+2}$ (coefficient=0.196, p-value=0.053). Collectively, table 25 suggests that IC disclosure and sufficient IC disclosure reflect firm's current and future profitability. Compared to IC disclosure, sufficient IC disclosure ($HIC_{j,t}$) has a higher absolute value of coefficients for all profitability measurements, which suggests that sufficient IC disclosure ($HIC_{j,t}$) is related more to enhancing firm's profitability. Of the three profitability measurements, IC explains ROA better than the other two measurements because the ROA measurement models show the highest R squares; this is followed by the ROE measurement. The lowest R squares are presented in RG measurement models, which is consistent with Clarke et al.' (2011) study where they found very low explanatory power in the RG measurement models where the R squares were 1.3% and 2.8%.

Table 25: Regression results for IC and firm's profitability (H8)

Table 25 panel A: Results for H8 with ROE as dependent variable and IC _{j,t} as independent variable												
	Model 41 with ROE _{j,t} as dependent variable				Model 42 with ROE _{j,t+1} as dependent variable				Model 43 with ROE _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
IC _{j,t}	0.020**	0.010	2.100	0.036	0.026***	0.009	2.800	0.005	0.022*	0.013	1.690	0.091
IND _{j,t}	0.103	0.081	1.260	0.207	0.194**	0.080	2.420	0.016	0.216**	0.109	1.980	0.048
PIST _{j,t}	-0.032	0.068	-0.460	0.643	0.033	0.067	0.490	0.622	0.094	0.092	1.010	0.311
Size _{j,t}	0.015*	0.008	1.740	0.082	-0.002	0.008	-0.190	0.848	-0.006	0.011	-0.540	0.592
Leverage _{j,t}	-0.044	0.051	-0.860	0.393	-0.025	0.051	-0.490	0.621	0.047	0.069	0.680	0.496
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-0.088	0.096	-0.910	0.363	-0.095	0.095	-1.000	0.318	-0.106	0.130	-0.820	0.414
Number of obs.	610				610				606			
R-squared	8.32%				5.4%				2.38%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 25: Regression results for IC and firm's profitability (H8) (continued)

Table 25 Penal B: The results for H8 with ROE as dependent variable and HIC _{j,t} as independent variable												
	Model 44 with ROE _{j,t} as dependent variable				Model 45 with ROE _{j,t+1} as dependent variable				Model 46 with ROE _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
HIC _{j,t}	0.059**	0.028	2.090	0.037	0.090***	0.028	3.210	0.001	0.046	0.038	1.200	0.230
IND _{j,t}	0.105	0.081	1.290	0.197	0.196**	0.080	2.450	0.015	0.221**	0.109	2.030	0.043
PIST _{j,t}	-0.036	0.068	-0.530	0.597	0.028	0.067	0.410	0.679	0.088	0.092	0.950	0.341
Size _{j,t}	0.015*	0.008	1.860	0.063	-0.001	0.008	-0.090	0.925	-0.004	0.011	-0.400	0.689
Leverage _{j,t}	-0.047	0.051	-0.910	0.366	-0.029	0.051	-0.580	0.561	0.046	0.070	0.660	0.506
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-0.018	0.089	-0.210	0.836	-0.006	0.087	-0.070	0.947	-0.027	0.119	-0.230	0.819
Number of obs.	610				610				606			
R-squared	8.32%				5.79%				2.14%			
*p<0.10, **p<0.05, ***p<0.01												

Table 25: Regression results for IC and firm's profitability (H8) (continued)

Table 25 Panel C: Results for H8 with ROA as dependent variable and IC _{j,t} as independent variable												
	Model 47 with ROA _{j,t} as dependent variable				Model 48 with ROA _{j,t+1} as dependent variable				Model 49 with ROA _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
IC _{j,t}	0.016*	0.009	1.790	0.073	0.011***	0.004	2.650	0.008	0.012***	0.004	2.880	0.004
IND _{j,t}	0.040	0.076	0.520	0.602	0.014	0.035	0.400	0.690	0.007	0.035	0.210	0.835
PIST _{j,t}	-0.083	0.064	-1.310	0.192	-0.034	0.029	-1.170	0.242	-0.055*	0.029	-1.860	0.063
Size _{j,t}	0.013	0.008	1.650	0.100	-0.002	0.004	-0.550	0.582	-0.006	0.004	-1.640	0.102
Leverage _{j,t}	-0.021	0.048	-0.440	0.662	-0.002	0.022	-0.100	0.919	0.008	0.022	0.380	0.706
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	0.101	0.090	1.120	0.264	0.082**	0.041	2.020	0.044	0.140***	0.041	3.400	0.001
Number of obs.	610				610				606			
R-squared	13.49%				11.52%				11.73%			

*p<0.10, **p<0.05, ***p<0.01

Table 25: Regression results for IC and firm's profitability (H8) (continued)

Table 25 Panel D: Results for H8 with ROA as dependent variable and HIC _{j,t} as independent variable												
	Model 50 with ROA _{j,t} as dependent variable				Model 51 with ROA _{j,t+1} as dependent variable				Model 52 with ROA _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
HIC _{j,t}	0.050*	0.027	1.870	0.062	0.027**	0.012	2.200	0.028	0.040***	0.012	3.300	0.001
IND _{j,t}	0.041	0.076	0.540	0.589	0.016	0.035	0.450	0.652	0.008	0.035	0.230	0.815
PIST _{j,t}	-0.087	0.064	-1.360	0.174	-0.036	0.029	-1.260	0.209	-0.057*	0.029	-1.950	0.051
Size _{j,t}	0.014*	0.008	1.740	0.082	-0.001	0.004	-0.370	0.712	-0.006	0.004	-1.550	0.121
Leverage _{j,t}	-0.023	0.048	-0.490	0.628	-0.003	0.022	-0.150	0.884	0.006	0.022	0.290	0.774
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	0.156*	0.083	1.880	0.060	0.121***	0.038	3.210	0.001	0.180***	0.038	4.760	0.000
Number of obs.	610				610				606			
R-squared	13.53 %				11.19%				0.1211			
* p<0.10, ** p<0.05, *** p<0.01												

Table 25: Regression results for IC and firm's profitability (H8) (continued)

Table 25 Panel E: Results for H8 with RG as dependent variable and IC _{j,t} as independent variable												
	Model 53 with RG _{j,t} as dependent variable				Model 54 with RG _{j,t+1} as dependent variable				Model 55 with RG _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
IC _{j,t}	0.051 [*]	0.027	1.870	0.061	0.062 [*]	0.035	1.780	0.075	0.056	0.034	1.650	0.100
IND _{j,t}	-0.144	0.230	-0.630	0.530	-0.014	0.295	-0.050	0.963	0.053	0.289	0.180	0.854
PIST _{j,t}	-0.033	0.192	-0.170	0.863	0.155	0.247	0.630	0.530	0.093	0.245	0.380	0.703
Size _{j,t}	0.074 ^{***}	0.024	3.120	0.002	0.068 ^{**}	0.030	2.230	0.026	0.062 ^{**}	0.030	2.090	0.037
Leverage _{j,t}	0.076	0.145	0.520	0.600	0.200	0.186	1.070	0.283	0.116	0.184	0.630	0.527
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-0.565 ^{**}	0.272	-2.080	0.038	-0.894 ^{**}	0.349	-2.560	0.011	-0.649 [*]	0.343	-1.890	0.059
Number of obs.	610				610				606			
R-squared	3.4%				3.19%				3.13%			

^{*} $p < 0.10$, ^{**} $p < 0.05$, ^{***} $p < 0.01$

Table 25: Regression results for IC and firm's profitability (H8) (continued)

Table 25 Panel F: Results for H8 with RG as dependent variable and HIC _{j,t} as independent variable												
	Model 56 with RG _{j,t} as dependent variable				Model 57 with RG _{j,t+1} as dependent variable				Model 58 with RG _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
HIC _{j,t}	0.153 [*]	0.080	1.910	0.056	0.179 [*]	0.103	1.740	0.082	0.196 [*]	0.101	1.940	0.053
IND _{j,t}	-0.139	0.229	-0.610	0.543	-0.007	0.295	-0.020	0.982	0.057	0.288	0.200	0.844
PIST _{j,t}	-0.044	0.192	-0.230	0.818	0.142	0.247	0.570	0.567	0.082	0.244	0.340	0.737
Size _{j,t}	0.076 ^{***}	0.023	3.230	0.001	0.070 ^{**}	0.030	2.340	0.020	0.064 ^{**}	0.030	2.160	0.031
Leverage _{j,t}	0.069	0.145	0.480	0.634	0.192	0.186	1.030	0.302	0.106	0.184	0.580	0.563
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-0.391	0.250	-1.560	0.118	-0.680 ^{**}	0.321	-2.120	0.034	-0.462	0.315	-1.470	0.143
Number of obs.	610				610				606			
R-squared	3.43%				3.17%				3.3%			

^{*} $p < 0.10$, ^{**} $p < 0.05$, ^{***} $p < 0.01$

Note: Leverage_{j,t} is measured by short-term and long-term debt divided by total assets for firm j, in year t. IND_{j,t} is percentage of independent directors on the board for firm j, in year t. PIST_{j,t} is percentage of shares held by institutions for firm j, in year t. Size_{j,t} is natural logarithm of total assets for firm j, at the beginning of year t.

Table 26 presents the results for H8 with productivity as the dependent variable using the year industry fixed-effects panel regressions. Table 26 panel A and panel B provide evidence for profitability with $ATO_{j,t}$, $ATO_{j,t+1}$, and $ATO_{j,t+2}$ as dependent variables. Table 26 panel A shows the results with $IC_{j,t}$ as an independent variable, while panel B shows the results with $HIC_{j,t}$ as an independent variable. Panel A shows that $IC_{j,t}$ is positively and significantly related to $ATO_{j,t}$ (coefficient=0.174, p-value=0.000), $ATO_{j,t+1}$ (coefficient=0.157, p-value=0.000), and $ATO_{j,t+2}$ (coefficient=0.145, p-value=0.001). Panel B shows that $HIC_{j,t}$ is positively and significantly associated with $ATO_{j,t}$ (coefficient=0.361, p-value=0.007), $ATO_{j,t+1}$ (coefficient=0.378, p-value=0.003), and $ATO_{j,t+2}$ (coefficient=0.386, p-value=0.002). Collectively, the results of table 26 combined with table 25 suggest that IC disclosure and sufficient IC disclosure reflect a firm's current and future financial performance in terms of profitability and productivity, while sufficient IC disclosure is more related to financial performance measurements because evidence shows that the coefficients of $HIC_{j,t}$ on firm's performance measurements are greater than the coefficients of $IC_{j,t}$ on firm's performance measurements.

Table 26: Regression results for IC and firm's productivity (H8)

Table 26 Panel A: Results for H8 with ATO as dependent variable and IC _{j,t} as independent variable												
	Model 59 with ATO _{j,t} as dependent variable				Model 60 with ATO _{j,t+1} as dependent variable				Model 61 with ATO _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
IC _{j,t}	0.174***	0.045	3.900	0.000	0.157***	0.043	3.620	0.000	0.145***	0.042	3.440	0.001
IND _{j,t}	0.930**	0.380	2.450	0.015	0.519	0.368	1.410	0.159	0.781**	0.358	2.180	0.030
PIST _{j,t}	-0.022	0.319	-0.070	0.944	0.046	0.308	0.150	0.881	-0.047	0.303	-0.160	0.877
Size _{j,t}	0.094**	0.039	2.400	0.017	0.105***	0.038	2.780	0.006	0.104***	0.037	2.820	0.005
Leverage _{j,t}	-0.036	0.240	-0.150	0.882	0.088	0.232	0.380	0.704	-0.041	0.228	-0.180	0.857
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-2.368***	0.450	-5.260	0.000	-2.154***	0.435	-4.950	0.000	-2.167***	0.425	-5.100	0.000
Number of obs.	610				610				606			
R-squared	20.4%				19.81%				20.56%			
* p<0.10, ** p<0.05, *** p<0.01												

Table 26: Regression results for IC and firm's productivity (H8) (continued)

Table 26 Panel B: Results for H8 with ATO as dependent variable and HIC _{j,t} as independent variable												
	Model 62 with ATO _{j,t} as dependent variable				Model 63 with ATO _{j,t+1} as dependent variable				Model 64 with ATO _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
HIC _{j,t}	0.361***	0.134	2.700	0.007	0.378***	0.129	2.940	0.003	0.386***	0.126	3.070	0.002
IND _{j,t}	0.968**	0.382	2.530	0.012	0.546	0.369	1.480	0.139	0.805**	0.359	2.240	0.025
PIST _{j,t}	-0.066	0.320	-0.210	0.837	0.009	0.309	0.030	0.977	-0.081	0.304	-0.270	0.790
Size _{j,t}	0.106***	0.039	2.730	0.007	0.115***	0.038	3.040	0.002	0.112***	0.037	3.040	0.002
Leverage _{j,t}	-0.046	0.242	-0.190	0.850	0.075	0.233	0.320	0.749	-0.055	0.228	-0.240	0.808
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-1.736***	0.416	-4.170	0.000	-1.596***	0.401	-3.980	0.000	-1.656***	0.391	-4.230	0.000
Number of obs.	610				610				606			
R-squared	19.35%				19.21%				20.23%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.5.6 Results for value relevance of IC (H9)

Table 27 presents the results for H9 with stock returns as the dependent variable using the year industry fixed-effects panel regressions. Since there were missing financial data in the database, the sample size was reduced to 574 firm-year observations³⁷. Model 65 shows the value relevance of IC disclosure, while model 66 shows the value relevance of sufficient IC disclosure. The results of model 65 show that none of the earnings measurements ($E_{j,t-1}$, $E_{j,t}$ and $E_{j,t+1to3}$) and its interaction measurements ($IC_{j,t} * E_{j,t-1}$, $IC_{j,t} * E_{j,t}$ and $IC_{j,t} * E_{j,t+1to3}$) are significantly related to $R_{j,t}$. These insufficient results may arise from a problem with multicollinearity, because the spearman and pearson correlations between earnings measurements and their interaction measurements are highly correlated to each other (coefficients > 0.9, p-value = 0.000) (see, section 4.5.4.2, table 24 panel B). Pearce & Reiter (1985) argued that multicollinearity can lead to estimated coefficients that are biased, as a cause of weak evidence. Model 66 of table 27 shows that $HIC_{j,t} * E_{j,t+1to3}$ is significantly and positively associated with $R_{j,t}$ (coefficient = 0.160, p-value = 0.000), which indicates that investors only perceived the sufficient IC disclosure as useful and relevant information to reflect on firms' future earnings, although the market reacted positively at stock pricing decisions with sufficient reporting. These results are consistent with H9 and suggest that sufficient IC disclosure signals future firm performance to the market, which then perceives such reporting is value-relevant. Moreover, there is a positive relationship between future earnings ($E_{j,t+1to3}$) and current stock returns ($R_{j,t}$) (coefficient = 0.020, p-value = 0.006) in sufficient IC disclosure model (model 66). The positive coefficients on future earnings show that news about future earnings is included in current stock returns. $R_{j,t+1to3}$, which played the role of a proxy to correct the measurement errors in future accounting-based earnings, is not significantly associated with the current stock return ($R_{j,t}$) in model 66, which indicates that

³⁷ 36 stock price information in 2015 is not available at research time.

the measurement error is not a problem for model 66. Model 66 results show that both $MktCap_{j,t}$ and $Opcycle_{j,t}$ are significantly and negatively associated with $R_{j,t}$ (coefficient=-0.096, p-value=0.000; coefficient=-0.056, p-value=0.013 respectively), indicating that large market capital firms and firms with long operating cycles have more difficulty in translating their financial information into current stock returns. $MtoB_{j,t}$ is positively and significantly associated with $R_{j,t}$ (coefficient=0.165, p-value=0.000) which suggests that firms with a higher rate of growth have higher earnings potential and are more likely to disclose sufficient IC information to inform investors about future earnings.

Table 27: Regression results for value relevance of IC (H9)

	Model 65 with $R_{j,t}$ as dependent variable				Model 66 with $R_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$E_{j,t-1}$	0.038	0.293	0.130	0.896	-0.063	0.097	-0.640	0.520
$E_{j,t}$	-0.128	0.233	-0.550	0.585	0.097	0.100	0.970	0.333
$E_{j,t+1to3}$	0.022	0.042	0.510	0.609	0.020***	0.007	2.740	0.006
$R_{j,t+1to3}$	-0.107*	0.057	-1.890	0.059	-0.001	0.021	-0.050	0.960
$IC_{j,t}$	0.008	0.012	0.630	0.529				
$IC_{j,t} * E_{j,t-1}$	-0.002	0.065	-0.030	0.977				
$IC_{j,t} * E_{j,t}$	0.038	0.048	0.790	0.429				
$IC_{j,t} * E_{j,t+1to3}$	0.001	0.010	0.110	0.916				
$IC_{j,t} * R_{j,t+1to3}$	0.026**	0.012	2.230	0.026				
$HIC_{j,t}$					-0.022	0.037	-0.610	0.541
$HIC_{j,t} * E_{j,t-1}$					-0.174	0.190	-0.920	0.361
$HIC_{j,t} * E_{j,t}$					-0.124	0.143	-0.870	0.386
$HIC_{j,t} * E_{j,t+1to3}$					0.160***	0.038	4.230	0.000
$HIC_{j,t} * R_{j,t+1to3}$					0.008	0.034	0.250	0.805
$MtoB_{j,t}$	0.165***	0.019	8.570	0.000	0.165***	0.019	8.690	0.000
$Mktcap_{j,t}$	-0.108***	0.011	-10.240	0.000	-0.096***	0.011	-9.120	0.000
$Opcycle_{j,t}$	-0.055**	0.023	-2.390	0.017	-0.056**	0.022	-2.490	0.013
Industry effects	YES							
Year effects	YES				YES			
_cons	0.881***	0.094	9.350	0.000	0.828***	0.085	9.730	0.000
Number of obs.	574				574			
R-squared	36.77%				38.29%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: $Opcycle_{j,t}$ is natural logarithm of days of accounts receivable plus days of inventory for firm j , in year t . $MktCap_{j,t}$ is size of the firm, measured as a natural logarithm of market capitalisation of firm j , at beginning of year t . $MtoB_{j,t}$ is measured as market value of equity divided by the book value of equity for firm j , in year t .

4.5.7 Results for IC and opportunistic underlying earnings reporting (H10)

Table 28 presents the results for H10 with $IC_{j,t}$ (model 67) and $HIC_{j,t}$ (model 68) as dependent variables using the year industry fixed-effects panel regression and the fixed-effects logit regression respectively. The results of table 28 indicate that $InEx_{j,t}$ is significantly and negatively related to both $IC_{j,t}$ and $HIC_{j,t}$ (coefficient=-0.307, p-value=0.025; coefficient=-0.394, p-value=0.044, respectively). Compared to the absolute value of the coefficient of $InEx_{j,t}$ on $IC_{j,t}$, the absolute value of the coefficient of $InEx_{j,t}$ on $HIC_{j,t}$ is higher and the result is more significant, which suggests that opportunistic underlying earnings management firms are less likely to disclose IC, particularly if they have difficulty in disclosing sufficient IC, which confirms H10.

Table 28: Regression results for IC and opportunistic underlying earnings reporting (H10)

	Model 67 with IC _{j,t} as dependent variable				Model 68 with HIC _{j,t} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
InEx _{j,t}	-0.307**	0.137	-2.240	0.025	-0.394**	0.196	-2.010	0.044
IND _{j,t}	0.611*	0.352	1.740	0.083	0.702	0.501	1.400	0.161
PIST _{j,t}	-0.302	0.292	-1.030	0.301	-0.126	0.414	-0.300	0.762
Size _{j,t}	0.164***	0.038	4.340	0.000	0.171***	0.055	3.140	0.002
Leverage _{j,t}	0.138	0.220	0.620	0.532	0.390	0.332	1.170	0.241
Meet _{j,t}	0.094	0.133	0.710	0.480	0.160	0.189	0.850	0.398
Loss _{j,t}	0.071	0.168	0.420	0.672	0.184	0.238	0.770	0.440
Industry effects	YES				YES			
Year effects	YES				YES			
_cons	3.787***	0.402	9.410	0.000	-1.686***	0.577	-2.920	0.004
Number of obs.	610						610	
R-squared	10.52%				Pseudo R-squared		4.85%	

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: InEx_{j,t} is income-increasing underlying earnings exclusions, which is measured by dummy variable that equals 1 if j firm discloses a underlying earnings number greater than the statutory earnings in year t, and zero otherwise. Meet_{j,t} is dummy variable that equals 1 if j firm's earnings before tax in year t is greater or equal to earnings before tax in year t-1, and zero otherwise. Loss_{j,t} is dummy variable that equals 1 if j firm made statutory losses in year t, and zero otherwise.

4.6 Additional tests

4.6.1 IC and market valuation (H9)

Prior studies examined the market valuation of IC using market-to-book ratios and argued that market valuation describes the degree to which a firm's market value exceeds its book value (e.g., Ghosh & Mondal, 2009). To robust the main result of value relevance, this paper examines the market valuation of IC using empirical Equation (19) and replaced the

dependent variable with market-to-book ratios. The market-to-book ratio is measured as the market value of equity divided by the book value of equity for firm j , in year t . Table 29 panel A and panel B provide evidence for value relevance with $MtoB_{j,t}$, $MtoB_{j,t+1}$, and $MtoB_{j,t+2}$ as dependent variables using the year industry fixed-effects panel regressions. Table 29 panel A shows the results with $IC_{j,t}$ as an independent variable, while panel B shows the results with $HIC_{j,t}$ as an independent variable. Panel A shows that $IC_{j,t}$ is positively and significantly associated with $MtoB_{j,t}$ (coefficient=0.085, p-value=0.000), $MtoB_{j,t+1}$ (coefficient=0.099, p-value=0.000), and $MtoB_{j,t+2}$ (coefficient=0.120, p-value=0.000). Panel B shows similar results to panel A where $HIC_{j,t}$ is positively and significantly associated with $MtoB_{j,t}$ (coefficient=0.167, p-value=0.013), $MtoB_{j,t+1}$ (coefficient=0.222, p-value=0.001), and $MtoB_{j,t+2}$ (coefficient=0.317, p-value=0.000). This indicates that sufficient IC disclosure is realised more effectively in the market value of a firm, as shown by the higher absolute value of coefficients rather than IC disclosure. To confirm the main results of H9, IC disclosure, especially sufficient IC disclosure, enables investors to evaluate firm value.

Table 29: Regression results for value relevance of IC with MtoB as the dependent variable (H9)

Table 29 Panel A: Results for H9 with MtoB as dependent variable and IC_{j,t} as independent variable

	Model 69 with MtoB _{j,t} as dependent variable				Model 70 with MtoB _{j,t+1} as dependent variable				Model 71 with MtoB _{j,t+2} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
IC _{j,t}	0.085***	0.022	3.820	0.000	0.099***	0.023	4.280	0.000	0.120***	0.024	4.970	0.000
IND _{j,t}	-0.066	0.190	-0.350	0.729	-0.254	0.197	-1.290	0.199	-0.205	0.205	-1.000	0.317
PIST _{j,t}	0.277*	0.160	1.730	0.084	0.230	0.165	1.390	0.165	0.210	0.174	1.210	0.227
Size _{j,t}	-0.193***	0.020	-9.870	0.000	-0.166***	0.020	-8.190	0.000	-0.128***	0.021	-6.080	0.000
Leverage _{j,t}	0.168	0.120	1.400	0.162	0.035	0.124	0.280	0.776	0.007	0.130	0.050	0.958
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	1.412***	0.225	6.260	0.000	1.488***	0.234	6.370	0.000	1.137***	0.243	4.670	0.000
Number of obs.	610				610				606			
R-squared	23.71%				20.83%				17.15%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 29: Regression results for value relevance of IC with MtoB as the dependent variable (H9) (continued)

Table 29 Panel B: Results for H9 with MtoB as dependent variable and $HIC_{j,t}$ as independent variable

	Model 72 with $MtoB_{j,t}$ as dependent variable				Model 73 with $MtoB_{j,t+1}$ as dependent variable				Model 74 with $MtoB_{j,t+2}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$HIC_{j,t}$	0.167**	0.067	2.490	0.013	0.222***	0.069	3.190	0.001	0.317***	0.072	4.390	0.000
$IND_{j,t}$	-0.046	0.192	-0.240	0.811	-0.234	0.198	-1.180	0.239	-0.186	0.206	-0.900	0.367
$PIST_{j,t}$	0.255	0.161	1.590	0.113	0.206	0.166	1.240	0.216	0.182	0.174	1.040	0.298
$Size_{j,t}$	-0.187***	0.020	-9.540	0.000	-0.159***	0.020	-7.860	0.000	-0.122***	0.021	-5.790	0.000
$Leverage_{j,t}$	0.164	0.121	1.350	0.176	0.028	0.125	0.230	0.821	-0.005	0.131	-0.040	0.971
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	1.723***	0.209	8.260	0.000	1.844***	0.216	8.530	0.000	1.559***	0.225	6.940	0.000
Number of obs.	610				610				606			
R-squared	22.65%				19.77%				16.41%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.6.2 Results for value relevance of three individual IC categories

This section attempts to investigate which category of IC disclosure is value-relevant to the market. Table 30 presents the results of H9 with sufficient disclosure of human capital ($HHC_{j,t}$), internal capital ($HINC_{j,t}$), and external capital ($HEC_{j,t}$) as independent variables using the year industry fixed-effects panel regressions. The results show that $HHC_{j,t} * E_{j,t+1to3}$ and $HINC_{j,t} * E_{j,t+1to3}$ are positively and significantly related to $R_{j,t}$ (coefficient=0.196, p-value=0.000; coefficient=0.357, p-value=0.071 respectively), which suggests the market believes that sufficient disclosure of human capital and internal capital help to reflect firms' future earnings. Interestingly, these results also find that $HEC_{j,t} * E_{j,t}$ and $R_{j,t}$ is positively and significantly associated (coefficient=0.794, p-value=0.005), which suggests that sufficient disclosure of external capital would bring current economic benefits to firms. The benefit of external capital is released faster than the other two categories because the market reacts positively to current earnings of firms with sufficient disclosure of external capital, and reacts positively to firms that disclose future earnings of sufficient human capital and internal capital.

Table 30: Regression results for value relevance of three individual IC categories as the independent variables (H9)

	Model 75 with $R_{j,t}$ as dependent variable				Model 76 with $R_{j,t}$ as dependent variable				Model 77 with $R_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$E_{j,t-1}$	-0.032	0.093	-0.350	0.728	-0.352**	0.179	-1.970	0.049	0.059	0.081	0.730	0.465
$E_{j,t}$	0.061	0.096	0.630	0.528	-0.027	0.128	-0.210	0.834	-0.032	0.077	-0.420	0.673
$E_{j,t+1to3}$	0.021***	0.007	2.890	0.004	0.034*	0.020	1.690	0.092	0.027***	0.007	3.870	0.000
$R_{j,t+1to3}$	0.007	0.021	0.340	0.735	-0.012	0.025	-0.460	0.646	-0.016	0.022	-0.710	0.475
$HHC_{j,t}$	-0.051	0.037	-1.390	0.165								
$HHC_{j,t} * E_{j,t-1}$	-0.428**	0.215	-1.990	0.047								
$HHC_{j,t} * E_{j,t}$	-0.036	0.143	-0.250	0.803								
$HHC_{j,t} * E_{j,t+1to3}$	0.196***	0.041	4.820	0.000								
$HHC_{j,t} * R_{j,t+1to3}$	-0.013	0.034	-0.380	0.707								
$HINC_{j,t}$					0.056	0.036	1.570	0.116				
$HINC_{j,t} * E_{j,t-1}$					-0.014	0.022	-0.650	0.513				
$HINC_{j,t} * E_{j,t}$					0.092	0.157	0.590	0.558				
$HINC_{j,t} * E_{j,t+1to3}$					0.357*	0.197	1.810	0.071				
$HINC_{j,t} * R_{j,t+1to3}$					0.042	0.033	1.260	0.209				
$HEC_{j,t}$									-0.009	0.038	-0.240	0.809
$HEC_{j,t} * E_{j,t-1}$									-0.224	0.200	-1.120	0.263

Table 30: Regression results for value relevance of three individual IC categories as the independent variables (H9) (continued)

Model 75 with $R_{j,t}$ as dependent variable					Model 76 with $R_{j,t}$ as dependent variable				Model 77 with $R_{j,t}$ as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
$HEC_{j,t} * E_{j,t}$									0.794***	0.281	2.820	0.005
$HEC_{j,t} * E_{j,t+1to3}$									-0.055	0.042	-1.330	0.185
$HEC_{j,t} * R_{j,t+1to3}$									0.067**	0.033	2.020	0.044
$MtoB_{j,t}$	0.160***	0.019	8.380	0.000	0.164***	0.019	8.520	0.000	0.171***	0.019	8.880	0.000
$Mktcap_{j,t}$	-0.093***	0.010	-8.840	0.000	-0.102***	0.010	-10.000	0.000	-0.107***	0.011	-9.910	0.000
$Opcycle_{j,t}$	-0.053**	0.023	-2.320	0.021	-0.054**	0.023	-2.390	0.017	-0.054**	0.023	-2.400	0.017
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	0.821***	0.085	9.710	0.000	0.871***	0.084	10.330	0.000	0.898***	0.085	10.520	0.000
Number of obs.	574				574				574			
R-squared	38.62%				37.53%				37.44%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: $HHC_{j,t}$ is dummy variable where each year is ranked on human capital (HC) and then the upper quartile of HC is selected as sufficient human capital disclosure and coded as one, zero otherwise. $HINC_{j,t}$ is dummy variable where each year is ranked on internal capital (INC) and then the upper quartile of INC is selected as sufficient internal capital disclosure and coded as one, zero otherwise. $HEC_{j,t}$ is dummy variable where each year is ranked on external capital (EC) and then the upper quartile of EC is selected as sufficient external capital disclosure and coded as one, zero otherwise.

4.6.3 Results for three individual IC categories and opportunistic underlying earnings reporting

The relationship between underlying earnings management and frequency of reporting by three categories of IC (internal capital, external capital, and human capital) are also examined to determine whether firms with underlying earnings management are less likely to disclose which category of IC. Table 31 presents the results of H10 with three categories of IC disclosure (including internal capital disclosure, external capital disclosure, and human capital disclosure). Panel A of table 31 presents the results of H10 with $HC_{j,t}$ (model 78), $INC_{j,t}$ (model 79) and $EC_{j,t}$ (model 80) as dependent variables using the fixed-effects panel regressions, while panel B of table 31 presents the results of H10 with $HHC_{j,t}$ (model 81), $HINC_{j,t}$ (model 82) and $HEC_{j,t}$ (model 83) as dependent variables using the year industry fixed-effects logit regressions. The results show that $HINC_{j,t}$ is significantly and negatively related to $InEx_{j,t}$ (coefficient=-0.421, p-value=0.035), and $EC_{j,t}$ and $HEC_{j,t}$ are significantly and negatively related to $InEx_{j,t}$ (coefficient=-0.223, p-value=0.003; coefficient=-0.475, p-value=0.017, respectively). The results of table 31 panel A and panel B indicate that firms who practice opportunistic underlying earnings management are less likely to disclose internal capital and external capital but have no association with human capital. A possible explanation for no association between opportunistic underlying earnings reporting and human capital disclosure is that a portion of human capital items can be easily imitated by low reporting quality firms. Here, 60% of sample firms reported employee thanked, 49% of sample firms reported employee numbers, 70% of sample firm reported managing directors' professional experience in the director prolife section. Because this paper argues that opportunistic underlying earnings reporting firms find it difficult to disclose inimitable IC, these three human capital items may introduce the bias in the regression model. Therefore, this paper re-examines model 78 and model 81 by excluding employee thanked, employee

numbers, and professional experience from human capital category. Model 84 is tested using the year industry fixed-effects panel regression with $HC_{j,t}$ excluding employee thanked, employee numbers, and professional experience items as the dependent variable, while model 85 is measured by the year industry fixed-effect logit regression with $HHC_{j,t}$ excluding employee thanked, employee numbers, and professional experience items as the dependent variable. The results show that after excluding employee thanked, employee numbers, and professional experience from human capital category, the $HC_{j,t}$ and $HHC_{j,t}$ are negatively and significantly associated with $InEx_{j,t}$ (coefficient=-0.085, p-value=0.004; coefficient=-0.813, p-value=0.018, respectively) suggesting that opportunistic underlying earnings reporting firms are hardly to disclose inimitable human capital.

Interestingly, the result shows a negative relationship between $PIST_{j,t}$ and $HIC_{j,t}$ (coefficient=-0.334, p-value=0.021) in model 79; this negative relationship supports the hypothesis of entrenchment, whereas an excessive ownership by institutional investors may have adverse effects on strategic disclosure decisions (Haniffa & Cooke, 2002). This result has been confirmed by empirical research; for example, Hidalgo et al. (2011) analysed corporate governance factors on voluntary disclosure of intangibles during fiscal years from 2005 to 2007 in a Mexican context and found a negative relationship between institutional investor shareholding and voluntary disclosure. Koh (2003) argued that institutional shareholders, who focus excessively on current earnings rather than long-term earnings in determining stock price, create incentives for managers to manage earnings opportunistically.

Table 31: Regression results for three individual IC categories disclosures and opportunistic underlying earnings reporting (H10)

Table 31 panel A: Results for H10 with HC_{jt}, INC_{jt} and EC_{jt} as dependent variables

	Model 78 with HC _{jt} as dependent variable				Model 79 with INC _{jt} as dependent variable				Model 80 with EC _{jt} as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
InEx _{jt}	0.026	0.052	0.510	0.610	-0.111	0.067	-1.640	0.101	-0.223***	0.075	-2.980	0.003
IND _{jt}	0.122	0.133	0.910	0.361	0.289*	0.173	1.670	0.095	0.200	0.192	1.040	0.298
PIST _{jt}	0.157	0.111	1.410	0.158	-0.334**	0.144	-2.320	0.021	-0.125	0.160	-0.790	0.433
Size _{jt}	0.038***	0.014	2.620	0.009	0.009	0.019	0.470	0.641	0.117***	0.021	5.700	0.000
Leverage _{jt}	0.028	0.083	0.330	0.740	0.106	0.108	0.980	0.327	0.003	0.120	0.030	0.977
Meet _{jt}	0.004	0.051	0.080	0.937	-0.029	0.066	-0.440	0.659	0.119	0.073	1.640	0.102
Loss _{jt}	-0.082	0.064	-1.290	0.197	-0.003	0.083	-0.030	0.975	0.156*	0.092	1.700	0.090
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	1.620***	0.153	10.620	0.000	1.334***	0.198	6.730	0.000	0.833***	0.220	3.790	0.000
Number of obs.	610				610				610			
R-squared	6.95%				11.98%				10.76%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 31: Regression results for H10 with three individual IC categories disclosures and opportunistic underlying earnings reporting (H10) (continued)

Table 31 panel B: Results for H10 with HHC _{j,t} , HINC _{j,t} and HEC _{j,t} as dependent variables												
	Model 81 with HHC _{j,t} as dependent variable				Model 82 with HINC _{j,t} as dependent variable				Model 83 with HEC _{j,t} as dependent variable			
	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z	Coef.	Std. Err.	z	P>z
InEx _{j,t}	0.010	0.197	0.050	0.961	-0.421**	0.200	-2.110	0.035	-0.475**	0.199	-2.380	0.017
IND _{j,t}	0.646	0.507	1.270	0.203	0.822	0.518	1.590	0.112	0.433	0.502	0.860	0.388
PIST _{j,t}	0.415	0.416	1.000	0.318	-0.618	0.433	-1.430	0.154	-0.232	0.425	-0.550	0.585
Size _{j,t}	0.224***	0.056	4.020	0.000	0.063	0.056	1.140	0.255	0.313***	0.058	5.390	0.000
Leverage _{j,t}	-0.248	0.363	-0.680	0.495	0.186	0.323	0.580	0.565	-0.007	0.312	-0.020	0.983
Meet _{j,t}	-0.168	0.191	-0.880	0.378	0.131	0.193	0.680	0.498	0.226	0.193	1.170	0.241
Loss _{j,t}	-0.002	0.241	-0.010	0.993	0.202	0.242	0.840	0.402	0.157	0.244	0.640	0.521
Industry effects	YES				YES				YES			
Year effects	YES				YES				YES			
_cons	-2.739***	0.592	-4.630	0.000	-0.417	0.584	-0.710	0.475	-2.386***	0.595	-4.010	0.000
Number of obs.	610				610				610			
Pseudo R-squared	6.62%				6.54%				6.88%			

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 31: Regression results for H10 with three individual IC categories disclosures and opportunistic underlying earnings reporting (H10) (continued)

Table 31panel B: Results for H10 with HC _{j,t} , HHC _{j,t} excluding employee thanked, employee numbers, and professional experience as dependent variables								
	Model 84 with HC _{j,t} excluding employee thanked, employee numbers, and professional experience as dependent variables as dependent variable				Model 85 with HHC _{j,t} excluding employee thanked, employee numbers, and professional experience as dependent variables as dependent variable			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	z	P>z
InEx _{j,t}	-0.085***	0.029	-2.880	0.004	-0.813***	0.344	-2.360	0.018
IND _{j,t}	-0.004	0.076	-0.050	0.957	-0.524	0.730	-0.720	0.472
PIST _{j,t}	0.001	0.063	0.020	0.982	-0.140	0.628	-0.220	0.824
Size _{j,t}	0.025***	0.008	3.130	0.002	0.281***	0.093	3.030	0.002
Leverage _{j,t}	-0.051	0.047	-1.070	0.284	-1.447	0.988	-1.470	0.143
Meet _{j,t}	0.035	0.029	1.220	0.222	0.289	0.314	0.920	0.358
loss _{j,t}	0.041	0.036	1.130	0.259	0.557	0.403	1.380	0.167
Industry effects	YES				YES			
Year effects	YES				YES			
_cons	0.038	0.087	0.440	0.663	-2.819***	0.941	-3.000	0.003
Number of obs.	610				610			
R-squared	8.80%			Pseudo R-squared	13.04%			

*p<0.10, **p<0.05, ***p<0.01

Note: INC_{j,t} is natural logarithm of frequency counts of internal capital for firm j, in year t. EC_{j,t} is natural logarithm of frequency counts of external capital for firm j, in year t. HC_{j,t} is natural logarithm of frequency counts of human capital for firm j, in year t. IC_{j,t} is the sum of natural logarithm of frequency counts of internal capital, external capital, and human capital for firm j, in year t. HHC_{j,t} is dummy variable where each year is ranked on human capital (HC) and then the upper quartile of HC is selected as sufficient human capital disclosure and coded as one, zero otherwise. HINC_{j,t} is dummy variable where each year is ranked on internal capital (INC) and then the upper quartile of INC is selected as sufficient internal capital disclosure and coded as one, zero otherwise. HEC_{j,t} is dummy variable where each year is ranked on external capital (EC) and then the upper quartile of EC is selected as sufficient external capital disclosure and coded as one, zero otherwise.

4.7 Summary of chapter four

Using resource-based theory and signalling theory, this paper has examined whether disclosing IC, which is treated as an inimitable and non-substitutable resource, can reflect a firm's financial performance, where financial performance is measured by firm's profitability and productivity. This paper has also looked at whether signals such IC through annual reports are seen by investors as value-relevant signals with which to evaluate firm. The value relevance of IC disclosure is measured by Lundholm & Myers' (2002) model. Finally, this paper has investigated whether opportunistic underlying earnings reporting firms are difficult in terms of signalling inimitable IC. Through a content analysis of 610 annual reports of ASX200 listed Australian firms, this paper finds the following results: a firm's financial performance indicates that IC disclosure, especially sufficient IC disclosure, is positively related to current and future profitability (as measured by ROA, ROE, and RG in the current year and the following two years) and productivity (as measured by ATO in the current year and the following two years). The result of value relevance shows a significant positive relationship between sufficient IC disclosure and the amount of future earnings reflected in the current annual returns. Collectively, the results confirm resource-based theory and signalling theory, in that IC is treated as the inimitable and non-substitutable resources of a firm to enhance their current and future financial performance, and also discloses these valuable resources through annual reports that reveal relevant future information to incorporate into current stock returns. Finally, this paper finds that IC disclosure, especially sufficient IC disclosure, is negatively related to opportunistic underlying earnings management. This results correlated with the results of paper one and paper two suggest that low quality firms are less likely to disclose IC because it is a resource that is difficult to imitate or replace; therefore, these firms engage in opportunistic underlying earnings

reporting to influence their investors' perceptions regarding performance in order to increase and maintain their stock prices.

In the additional tests this paper re-examines the value relevance of IC disclosure, using market-to-book ratios to measure market valuation. The results validate the value relevance results and find that IC disclosure and sufficient IC disclosure are positively and significantly associated with current and future market-to-book ratios. This paper also investigates which particular category of IC (including internal capital, external capital and human capital) is value-relevant to the market. The results show that external capital can carry information about current earnings to the market, while human capital and internal capital can bring future earnings forward to current stock returns such that the market perceives that disclosure of external capital reflects current earnings, while human capital and internal capital reflect future earnings. Finally, this paper finds that firms who disclose opportunistic underlying earnings rarely disclose external capital, internal capital and inimitable human capital.

CHAPTER FIVE Concluding remarks

5.1 Aims and results of this thesis

This thesis contains three papers with the following objectives. Paper one is to examine how manager's report underlying earnings in order to determine whether this is used to help investors evaluate firms' underlying performance or to opportunistically influence investors' perceptions of firm performance and how investors respond to this type of reporting. Two types of reporting are tested in the first paper: efficient reporting based on signalling theory and opportunistic reporting based on prospect theory and agency theory. Based on signalling theory, the first paper argues that to reduce information asymmetry and dissatisfaction with statutory earnings, managers are more likely to make voluntary disclosure of underlying earnings to reflect underlying performance which could recur in the future. Based on prospect theory and agency theory, this first paper assumes that because people are self-interested and averse to loss, when firms fail to meet statutory earnings targets or make current statutory losses, managers may opportunistically define underlying earnings higher than statutory earnings to influence investors' perceptions of firm performance when firms miss their statutory earnings target or make current statutory losses. Efficient reporting is investigated by the relationship between earnings persistence and the likelihood of underlying earnings reporting; the relationship between earnings predictability and the likelihood of underlying earnings. Opportunistic reporting is examined by the likelihood of managers using opportunistic income-increasing underlying earnings exclusions when firms miss their statutory earnings target or make current statutory losses. The results confirm the opportunistic reporting hypothesis that when firms do not meet earnings targets or make statutory losses, managers are more likely to use income-increasing underlying earnings exclusions to make them look greater than statutory earnings. Specifically, managers opportunistically exclude recurring expenses to make underlying earnings look better than statutory earnings and categorise them as 'Other' unspecific expenses so there is less chance

of them being detected; this suggests that income-increasing exclusions represents inappropriate classification of the earnings component by managers. Investors, however, are misled by this opportunistic reporting behaviour. They perceive current statutory earnings irrelevant and reacted favourably to such underlying earnings.

Since paper one found that managers disclose underlying earnings opportunistically to induce investors' perceptions of firm performance such that they overvalue the stock price. Paper two applies agency theory of overvalued equity to examine whether overvalued firms engage in earnings management and whether the duration of overvaluation is an important determinant on managers' decision of using accrual earnings management and opportunistic underlying earnings reporting. According to agency theory of overvalued equity, when a firm's stock price becomes overvalued, managers of overvalued firms not only refuse any market correction of overvalued stock prices, but they actually tend to extend overvaluation by engaging in different earnings management techniques that increase reported earnings. Therefore, equity overvaluation induces managers to engage in alternative earnings management in order to maintain this upward trend in stock prices (Jensen, 2005). The second paper shows evidence consistent with this reasoning, finding that overvalued firms are more likely to disclose underlying earnings and report them opportunistically for the whole sample periods. Considering how the duration of overvalued equity influenced managers' choices of earnings management, the results suggest that managers engage in accruals earnings management at an early stage, as the duration of overvaluation continues, they are more likely to also disclose underlying earnings opportunistically. The results of second paper suggest that the duration of equity overvaluation is an important determinant of management decision to use different earnings management.

Paper three applies resource-based theory and signalling theory to examine whether disclosing IC, which is treated as an inimitable and non-substitutable resource, can reflect a firm's financial performance, and whether signals IC to investors are value-relevant for evaluating firm value. Paper three finds that IC signals firms' future economic benefits, which are value-relevant for decision-making and carries future benefits forward to current stock returns. Specifically, IC disclosure and sufficient IC disclosure are positively and significantly related to a firm's current and future financial performance (i.e., they are positively and significantly related to current and future ROE, ROA, RG, and ATO); sufficient IC disclosure is significantly and positively associated with the amount of future earnings reflected in the current stock returns. In addition, paper three provides an insight into the relationship between IC disclosure and earnings management by arguing that low quality firms are less likely to voluntarily disclose IC because they find it hard to imitate. The results confirm the hypotheses made because evidence has presented that IC disclosure, especially sufficient IC disclosure, is negatively related to opportunistic underlying earnings management. Combining the results of paper one and paper two suggests that low quality firms are less likely to disclose IC because it is a difficult signal to imitate, so these firms engage in opportunistic underlying earnings reporting to influence investors' perception of firms' performances to increase and maintain their stock prices.

5.2 Contributions

This section discusses the contributions of each paper in turn. Paper one makes three significant contributions; first, prior research in the U.S. provides mixed results about how managers' report non-statutory earnings (e.g., Bradshaw & Sloan, 2002; Brown & Sivakumar, 2003; Bhattacharya et al., 2003; Doyle et al., 2003; Johnson & Schwartz, 2005),

so it contributes to existing debates about non-statutory earnings reporting by examining the way manager's report underlying earnings and market reactions to underlying earnings reporting in the Australia context. Second, only a few studies have examined how manager's report non-statutory earnings based on theories, so paper one developed research hypotheses based on signalling theory, prospect theory, and agency theory. Signalling theory is used to test the efficient underlying earnings reporting hypothesis, while prospect theory and agency theory are used to examine the opportunistic underlying earnings reporting hypothesis. Third, paper one contributes to the policy debate surrounding the usefulness of underlying earnings for users such as investors or creditors. AICD supports firms' reporting underlying earnings as an alternative performance measurement (AICD & FINSIA, 2009), although the ASIC is concerned that underlying earnings is information that may mislead investors (ASIC, March, December 2011). Paper one contributes to these debates by stating that underlying earnings are opportunistically manipulated by managers when they do not meet earnings targets, or make current statutory losses.

The second paper contributes to the literature on equity overvaluation and earnings management by examining whether overvalued equity firms engage in earnings management and whether managers alternate between accruals earnings management and opportunistic underlying earnings reporting to sustain the overvaluation. There are three papers in the extant literature that have examined the association between opportunistic non-statutory earnings disclosure (pro forma earnings) with within-statutory earnings management techniques (accruals earnings management and/or real activities earnings management) (Black et al., 2014; Doyle et al., 2013; Elshafie et al., 2010). All three papers found that managers alternate between within-statutory earnings management and opportunistic non-statutory earnings disclosure, but these three papers did not examine whether the duration of

equity overvaluation motivates managers to use different earnings management techniques alternatively. Second, while previous studies have examined the relationship between pro forma earnings and accruals earnings management using the absolute value of accruals earnings management, paper two examines the absolute value of accruals earnings management and also whether managers use income-increasing accruals earnings management and income-increasing underlying earnings exclusions alternatively. Third, paper two also empirically tests Jensen's (2005) agency theory of overvalued equity. Badertscher (2011) examined overvaluation and managers choice of non-statutory earnings management and found that overvalued firms are more likely to engage in non-statutory earnings management than firms that are not overvalued. However, Badertscher (2011) defined non-statutory earnings management as firms that identified restatement announcements that raised questions about the quality of financial reporting. It is not clear whether managers use opportunistic non-statutory earnings disclosure as an earnings management tool to substitute for other earnings management tools to sustain overvalued equity. Paper two extends Badertscher's (2011) study by investigating how the duration of overvalued equity influences managers' to use accruals earnings management and opportunistic underlying earnings reporting. Fourth, Zang (2012) examined the role of earnings management costs in managers' decisions to trade off different earnings management tools. Paper two extends Zang's (2012) study by examining whether the constrained abilities of managers using accruals earnings management and income-increasing accruals earnings management influence their decision to transit into underlying earnings disclosure and disclose them opportunistically in order to sustain overvalued equity.

The third paper makes several contributions to existing literature on IC disclosure and earnings management. First, prior studies have found that firms who make sufficient IC

disclosure have a high earnings quality and therefore argue that IC was quite important with regards to a firm's growth and success (see, Darabi et al., 2012; Mojtahedi, 2013), but none looked at whether firms with earnings management are less likely to disclose IC. Paper three is the first paper to examine the relationship between earnings management and IC disclosure, and suggests that firms with earnings management find it hard to disclose IC because it is difficult to imitate and replace. Second, previous studies found that IC is the key to maximising the economic value of firms (Edvinsson & Malone, 1997) and contributing to their long-term strategic focus (Roos et al., 1998), but it cannot yet be determined whether the benefits of IC disclosure are long-term. Previous studies with regards to whether IC disclosure can demonstrate the value-relevant information that took place during the reporting period to investors or value-creation for the future are rare (Abeysekera, 2011. p.20). Paper three is the first study in Australia to examine whether IC disclosure can enhance current and future financial performance, and whether disclosing IC through annual reports is value-relevant to investors' decision making using content analysis for a large sample of Australian listed firms. Third, Abeysekera (2006) observed that the development of a theoretical framework underlying IC disclosure is in its infancy, with few studies providing a strong theoretical basis for interpreting their findings; in fact research on IC underpinned by signalling theory is extremely limited (Li et al., 2008). Paper three has built a theoretical framework based on resource-based theory and signalling theory to develop research hypotheses.

The findings of this thesis can have positive implications for the development of accounting standards and practices in Australia. As this thesis finds that managers report underlying earnings opportunistically to mislead investors and sustain overvalued equity, these findings provide useful insights for corporate regulators such as the Australian Securities & Investments Commission, who presently oppose firms' publishing underlying earnings, so

that they can make an empirically valid decision for further action. It may prove useful for investors to have a better understanding of how managers exercise the discretion inherent within accounting standards and outside accounting standards alternatively, to mask poor firm performance or to sustain the overvalued stock prices. Findings are also useful to those who use IC to assess the quality of a firm (such as creditors and investors) because the findings confirm that low quality firms are unlikely to disclose sufficient IC.

5.3 Main limitations of the research and suggestions for future research

There are several limitations that should be considered when interpreting the results of this thesis. First, they may not be applicable to other countries and other non-listed Australian firms because only ASX200 listed Australian firms were investigated. Second, the limited sample size constrains paper two to use more precise overvaluation measurements. Third, since underlying earnings reporting is a new area in earnings management literature, the specific control variables of underlying earnings reporting have not been examined by the current literature, so the specific controls for underlying earnings are not supported by literature and may not comprehensively explain underlying earnings reporting. Fourth, the coding framework of IC used in paper three contains 33 IC items, whereas other studies used coding frameworks with less or more varied IC items, so when comparing the results of paper three with other studies, the findings must recognise these different approaches. Fifth, paper three is the first to examine the relationship between IC disclosure and earnings management, which means the theoretical framework may not be comprehensive.

The results of this thesis provide several avenues for future academic research. Since paper two only examined the relationship between overvaluation and managers' decision to use accruals earnings management and underlying earnings disclosure alternative, researchers can extend this result to examine the effect of real activities earnings management on overvaluation and managers' choices on using accruals earnings management, real activities earnings management, and underlying earnings disclosures. Moreover, paper one and paper two provided the evidence that meeting earnings benchmarks and sustaining the overvalued equity motivate managers to engage in opportunistic underlying earnings reporting. Finding other motivations for underlying earnings reporting would also be an attractive area for researchers. For example, studies can examine the influence of management share options on the underlying earnings disclosures. Future research could also examine what factors cause firms to become overvalued and what are the solutions to the agency costs of overvalued equity, including the role of governments, regulators, and other constraints on earnings management mechanisms. Furthermore, research would examine IC disclosure and its implications for other aspects of firm's benefits such as corporate reputations. Finally, future research could extend the current study of IC disclosure and earnings management into a detailed examination from a different angle, using different methods. For example, a future study could conduct interviews or surveys to examine directors' perceptions on IC and how they perceive the role of IC disclosure on firms' earnings management.

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Appendices

Appendix 1: Literature review summaries

Appendix 1.1: Literature review summary for paper one (Non-statutory reporting and market reactions)

				Motivations			Market Reactions			
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results
Bradshaw, M. T., & Sloan, R. G.	2002	1985-1997	OLS	YES			YES		Dependent variable-Buy-and-hold returns from two days after the last quarterly earnings announcement and through the day after the current period earnings announcement; Independent variables- Forecast errors of Street earnings, Forecast errors of GAAP earnings, time-period dummy variable	Both the earnings response coefficient and regression R squares significantly higher for Street earnings than GAAP earnings
Brown, L., & Sivakumar, K.	2003	1989-1997	Predictive Ability-t test; Valuation and information content-OLS, Vuong Z tests	YES			YES		Predictive Ability: absolute value of differences between prediction errors of Street earnings (I/B/E/S) and predication errors of Operating income (Compustat); Valuation: Dependent variable-market value per share; Independent variables - Operating income reported by Compustat, Street earnings reported by I/B/E/S; Information content: Dependent variable- CAR Independent variables- unexpected operating income, unexpected Street earnings	Street earnings are a better measure of predictive ability, valuation, and information content than GAAP earnings
Bhattacharya, N., Black, E. L., Christensen, T. E., & Larson, C. R.	2003	1998-2000	Vuong Z tests, t-test, and OLS	YES			YES		Informativeness: Dependent variable-CAR Independent variables-forecast errors of street earnings (IBES), forecast errors of Pro forma earnings(hand-collation), forecast errors of GAAP Operating earnings Permanence: Dependent variables- revision in one-quarter-ahead earnings forecasts based on information in the current quarterly earnings announcement; Independent variables-forecast errors of street earnings (IBES), forecast errors of Pro forma earnings(hand-collation), forecast errors of GAAP Operating earnings	Coefficient on forecast errors of Pro forma significantly and positively associate with CAR and Revision. R square is higher for Pro forma earnings

Appendix 1.1 (continued)											
				Motivations			Market Reactions				
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results	
Bowen, R. M., Davis, A. K., & Matsumoto, D. A.	2005	April 7, 2001- June 7, 2001	Chi-squared tests, t-tests, OLS	YES			YES		Dependent variable -CAR; Independent variables-Emphasis scores from most to least (pro forma earnings reported in the headline; in the first/second paragraph; in paragraph three or later; in the financial statements only)	Incremental information of pro forma earnings increases with greater relative emphasis on this metric, when the GAAP earnings have low value relevance	
Collins, D., Li, O., & Xie, H.	2009	1985-2000	Huber-White t-test, OLS	YES			YES		Dependent variables -Abnormal returns, abnormal-return volatility, and abnormal trading volume; Independent variables -Street earnings surprises and GAAP earnings surprises	Market participants increasingly rely on street earnings for their stock pricing decisions. Street earnings surprises are significantly and positively related to three models	
Albring, S. M., Cabán-García, M. T., & Reck, J. L.	2010	2002-2007	Huber-White t-test, OLS, Vuong Z tests	YES			YES		Dependent variables-Fiscal year-end closing stock price; 1-year total stock return; Independent variables-GAAP operating EPS; pro forma EPS	Pro forma earnings are mainly associated with stock prices and stock returns; Pro forma EPS is much more value relevant in determining stock price and return than GAAP EPS (Vuong Z is significantly positive)	
Walker, M., & Louvari, E.	2003	1996	Chi-squared tests, logistic		YES				Dependent variable-Alternative EPS; Independent variables-The alternative EPS is positive when FRS3 is negative, The alternative would be negative but not as negative as FRS3 EPS, Firms that would report a greater loss under the alternative than under FRS3, A firm reporting profit under FRS3 would report a loss under the alternative, A firm would report a higher profit under the alternative, Disclosure of the alternative would result in a lower profit	The voluntary disclosure of an alternative EPS measure is positively related to the extent to which the alternative measure exceeds FRS3 EPS after controlling analyst following, firm size, return volatility, firm's general attitude towards public disclosure for the full sample; Voluntary disclosure of an alternative EPS measure is negatively related to the alternative would be negative but not as negative as FRS3 EPS after controlling analyst following, firm size, return volatility, firm's general attitude towards public disclosure for the full sample	

Appendix 1.1 (continued)

				Motivations			Market Reactions			
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results
Johnson, W. B., & Schwartz, W. C.	2005	June to August 2000	t-tests, OLS		YES		YES		<p>Persistence of GAAP: compare the persistence of GAAP earnings reported by pro forma reporters and non-pro forma reporters;</p> <p>Stock pricing (price level): compute a market-multiple prediction error (actual value minus warranted value) for pro forma firms;</p> <p>Stock returns: Dependent variable-CAR, Independent variables-earnings surprise (difference between an adjusted EPS and the latest consensus EPS forecast from analysts, scaled by the stock price 23 days prior to the earnings announcement), Loss dummy variable equals 1 when GAAP operating EPS is negative, and 0 otherwise, and the interaction between earnings surprise and Loss dummy variable</p>	<p>Persistence of GAAP- no difference in the persistence of GAAP operating EPS for pro forma and non-pro forma firms;</p> <p>Stock pricing-mean prediction error is reliably positive and economically significant. However, median prediction errors are not reliably positive across valuation models;</p> <p>Stock returns-The incremental pro forma coefficients for earnings surprise and interaction between earnings surprise and Loss dummy variable are not different from zero</p>
Doyle, J., Lundholm, R., & Soliman, M.	2003	1988-1999	Fama-MacBeth t-statistics, OLS		YES			YES	<p>Predictability of the exclusions: Dependent variable-cash flows up to three years into the future, Independent variables-total exclusions (Pro forma earnings minus GAAP earnings), special items, other exclusions;</p> <p>Value relevance of exclusions: Dependent variable-market-adjusted stock return over the next one, two, or three years Independent variables-total exclusions, special items, 'other' exclusions</p>	<p>Future cash flows are negatively significantly related to total exclusions and also negatively related to 'other' exclusions;</p> <p>Significant negative relationship between future market returns and total exclusions, and negatively associated to 'other' exclusions</p>
Entwistle, G. M., Feltham, G. D., & Chima, M.	2006	2001-2003	t-statistics		YES				Disclosing pro forma earnings in a potentially misleading manner (GAAP Terminology and Claiming Achievements)	S&P 500 firms are disclosing pro forma earnings in a potentially misleading manner by using traditional GAAP terminology

Appendix 1.1 (continued)											
				Motivations			Market Reactions				
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results	
Black, D. E., & Christensen, T. E.	2009	1998–2003	OLS and Logit		YES				Aggressive pro forma reporting: Dependent variables-convert a GAAP operating loss to a pro forma profit; pro forma earnings meet the analyst' benchmark while GAAP earnings are not; Independent variables-nine different adjustment items	Managers use recurring items to convert a GAAP operating loss to a pro forma profit and to meet the analyst' benchmark	
Landsman, W. R., Miller, B. L., & Yeh, S.	2007	1990-2000	Year and industry fixed-effects		YES			YES	<p>Abnormal earnings forecasting: Dependent variables-abnormal earnings; Independent variables-measured as earnings less a normal return on beginning equity book value; total exclusions, special items or other exclusions as independent variables;</p> <p>Exclusion component prediction: Dependent variables-one year ahead total exclusions, special items or other exclusions; Independent variables-total exclusions, special items or other exclusions;</p> <p>Valuation: Dependent variable-market value of common shares outstanding at fiscal year-end; Independent variables-total exclusions, special items or other exclusions</p>	The market misprices positive and negative total exclusions, special items, and other exclusions, and that the overvaluation or under-valuation is generally consistent with the market-inefficiency	
Barth, M., Gow, L., & Taylor, D.	2012	2006	t-statistics, Wilcoxon Z statistics test, probit, OLS		YES				<p>Opportunism: Dependent variables-pro forma (Street) stock-based compensation excluders (dummy variable code as one if firm's pro forma (Street) earnings excludes stock-based compensation expense, Independent variables-stock-based compensation expense, earnings surprise, loss avoidance (dummy variable code as one if excluding stock-based compensation expense results in the firm avoiding a loss), earnings smoothness (standard deviation of a firm's stock-based compensation expense across sample years);</p> <p>Predictability: Dependent variable-annual changes of one year ahead GAAP earnings, Independent variables-annual changes stock-based compensation expense, pro forma (Street) stock-based compensation excluders, the interaction between annual changes stock-based compensation expense and pro forma (Street) stock-based compensation excluders</p>	<p>Opportunism-stock-based compensation, earnings surprise, loss avoidance, earnings smoothness are positively and significantly associate with pro forma excluders;</p> <p>Predictability- stock-based compensation expense has predictive ability for future earnings for Street Includers, but that is not true for Street Excluders. The coefficient on interaction between annual changes stock-based compensation expense and Street stock-based compensation excluders is positively and significantly</p>	

Appendix 1.1 (continued)										
				Motivations			Market Reactions			
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results
Isidro, H., & Marques, A.	2014	2003–2007	logistic		YES				Dependent variables-Non-GAAP earnings meet or beat the earnings benchmark (dummy variable code as one if non-GAAP earnings meet or beat analysts' consensus when GAAP earnings fall short); profit growth (dummy variable code one if non-GAAP earnings meets or beats last year's GAAP earnings when GAAP earnings is less than last year's GAAP earnings); and loss avoidance (dummy variable code one if the non-GAAP earnings are positive when GAAP earnings are negative); Independent variables- efficiency of the legal and enforcement system, investor protection, financial market development, communication and dissemination of information	Beating all earnings benchmarks with non-GAAP earnings is positively related to efficiency of the legal system; is positively associated with strong investor protection and development of financial market; is positively associated with good communication and dissemination of information
Hitz, J.-M.	2010	2005-2006	Pooled probit; fixed-effects linear probability model		YES				Determinants of pro forma disclosures: Dependent variable-pro forma disclosure Independent variables-earnings management incentives, in formativeness of GAAP earnings; Emphasis: Dependent variable-emphasis assigned to Non-GAAP earnings vis-à-vis GAAP earnings Independent variables-earnings management incentives, in formativeness of GAAP earnings	Firms emphasise non-statutory profit versus GAAP profit and firms that miss earnings benchmarks are much more likely to disclose non-statutory profit than firms that meet or beat these benchmarks
Lougee, B. A., & Marquardt, C. A.	2004	1997-1999	t-tests (Wilcoxon tests), Vuong Z-statistic, Probit, and OLS			YES	YES		Determinants of pro forma reporting decision: Dependent variable-pro forma disclosures; Independent variables-GAAP earnings in formativeness (earnings response coefficient; adjusted R squares); Controls-high-technology firms and intangible intensity, Growth Firms, Leverage, Earnings Variability; Investors response to pro forma earnings: Dependent variable-CAR; Independent variables-earnings surprise (difference between the earnings measure in pro forma/GAAP earnings and the same measure from the comparable quarter from the prior year), seasonally pro forma earnings, seasonally GAAP earnings; Predictive ability: Dependent variables-year-ahead GAAP and pro forma earnings market-year-ahead adjusted return, Independent variable-earnings surprise based on pro forma earnings	Efficient reporting-Firms with less informative GAAP earnings are more likely to disclose pro forma earnings; Opportunistic reporting-Firms that miss earnings benchmarks under GAAP earnings (earnings surprise based on GAAP is negative) are more likely than other firms to include pro forma earnings in their press releases; Pro forma earnings are more useful for investors when GAAP earnings in formativeness is low or when strategic considerations are absent

Appendix 1.1 (continued)											
				Motivations			Market Reactions				
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results	
Frederickson, J. R., & Miller, J. S.	2004	2001	Experiment study, t-tests, OLS				For sophisticated investors	For less-sophisticated investors	Two groups: one is MBA as less-sophisticated investors; another is analysts as sophisticated investors; Purposes: 1. Test the difference stock valuation between two groups. 2. Test the different valuation model used by less-sophisticated investors and more sophisticated investors	Non-professional investors who received an earnings announcement that contained both GAAP and pro forma disclosures assessed a higher stock price than non-professionals who received an announcement containing only GAAP disclosure; Financial analysts' judgments on stock price are not affected by the pro forma disclosure	
Curtis, A. B., McVay, S. E., & Whipple, B. C.	2014	2004-2009	Paired t-test, Fixed-effects, Logistic			YES		YES	Transitory Gain Persistence: Dependent variable-Future Operating Earnings; Independent variable-Transitory Gain; Earnings Response Coefficients: Dependent variable-Announcement Return, Independent variable-Filing Return, transitory gain; Determinants of Disclosure Choice: Dependent variable-Opaque Disclosers (Non-GAAP EPS Includes Gain); Independent variables-meet or beat earnings benchmarks (analysts-dummy variable code as one if including the transitory gain in EPS results in meeting the analyst forecast; prior period-dummy variable code as one if including the transitory gain in EPS results in meeting the four-quarter-ago EPS; profit-dummy variable code as one if including the transitory gain in EPS results in a profit)	Efficient reporting- transitory gains assisting investors in the efficient pricing of these gains; Opportunistic reporting-Opaque Disclosers group is significantly negatively associated with future operating earnings and significantly positively related to announcement return and filing return. The meeting or beating earnings benchmarks is significantly positively related to opaque disclosing	
Choi, Y.-S., & Young, S.	2015	1993-2001	Chi-square statistic, logistic			YES			Dependent variable-Non-GAAP earnings disclosure; Independent variables-GAAP miss benchmarks (one if unscaled GAAP EPS falls short of unscaled IBES forecast EPS), absolute value of all transitory items, the interaction between GAAP miss benchmarks and absolute value of all transitory items	Efficient reporting- disclosure probability of non-GAAP earnings is positively related to transitory items when the GAAP earnings met or exceeded analyst's consensus earnings forecast; Opportunistic reporting-the positive relationship between disclosure probability of non-GAAP earnings and transitory items is significantly weaker when GAAP earnings fell short of expectations	

Appendix 1.1 (continued)										
				Motivations			Market Reactions			
Authors	Year	Study Period	Method	Efficient	Opportunistic	Co-exist	Market efficient	Market mispricing	Test Variables	Significant Results
Elliott, W. B.	2006	2002	Experiment study, t-tests, OLS				For sophisticated investors	For less-sophisticated investors	<p>Four conditions: condition one-presents quarterly GAAP earnings only without emphasis; condition two-only quarterly GAAP earnings was presented in the headline; condition three-quarterly Pro forma (GAAP) earnings was presented in the headline but without reconciliation; condition four- quarterly pro forma earnings was presented in the headline with reconciliation;</p> <p>Test the firm performance valuation: Dependent variables-earnings performance, investment amount;</p> <p>Independent variables -reconciliation, pro forma reliability</p>	<p>The judgments and decisions of nonprofessional investors were influenced by the emphasis that management places on pro forma earnings, but that this influence is mitigated by the presence of a quantitative reconciliation between GAAP earnings and Pro forma earnings;</p> <p>The presence of reconciliation between GAAP earnings and Pro forma earnings also influenced analysts' judgments and decisions, but in the opposite direction to those of nonprofessional investors</p>
Andersson, P., & Hellman, N.	2007	2007	Experiment study, t-tests					YES	Two groups: One group includes pro forma earnings and GAAP earnings, while the second group involves GAAP earnings only	Analysts who were given both GAAP and pro forma earnings had much higher GAAP EPS forecasts than the analysts who received GAAP earnings only
Allee, K. D., Bhattacharya, N., Black, E. L., & Christensen, T. E.	2007	1998-2003	F-test, OLS				YES for sophisticated investors	YES for less-sophisticated investors	<p>Dependent variables-Small investors' abnormal net buying activities over the three-day announcement window, large investors' abnormal net buying activities over the three-day announcement window;</p> <p>Independent variables-earnings surprise, the interaction between earnings surprise and pro forma earnings disclose, the interaction between earnings surprise and pro forma emphasis, the interaction between earnings surprise and reconciliation</p>	<p>Less-sophisticated investors react positively on quarterly earnings press releases that include a pro forma number, while more sophisticated investors react negatively on these information;</p> <p>Less sophisticated investors react positively on the pro forma figure when management emphasises pro forma earnings strategically, while trading of sophisticated investors is unaffected by the relative emphasis of the two earnings metrics</p>
Choi, Y.-S., Lin, S., Walker, M., & Young, S.	2007	1994,1996, 2001	Vuong tests, t-test, and OLS	YES					<p>Incremental value: Dependent variable- stock price per share measured as 3 months after the fiscal year-end. Independent variables-additional aggregate management exclusions made by managers beyond analysts (management exclusions), aggregate items classified by analysts as non-recurring but included by managers (management inclusions);</p> <p>Incremental forecasting relevance: Dependent variables-1-year-ahead and aggregate 2-year-ahead operating cash flow; Independent variables-management exclusions, management inclusions</p>	Management exclusions are not significantly related to stock price and future cash flows; management inclusions are negatively and significantly associated with stock price and future cash flows

Appendix 1.2: Literature review summary for paper two (Managers' decisions on using multiple earnings management mechanisms)

Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Mizik, N.	2010	1986–2005	Fixed-effects			YES	Dependent variables- current abnormal stock return or future abnormal stock returns (one to four years ahead) Independent variables- Myopic firms (dummy variable that takes the value of 1 if firm i in year t engaged in real activities earnings management); no accruals inflation (dummy variable that takes the value of 1 if myopic firms not engaging in aggressive accruals earnings management which is measured by modified cross-sectional Jones model, Dechow et al., 1995)	Market is misled by real activities earnings management. Real activities earnings management has a long-term net negative impact on firm value. It is real activities earnings management, not accruals earnings management, have the greater negative impact on future financial performance
Alhadab, M., Clacher, I. & Keasey, K.	2015	1998-2008	Logit; t-tests; time-industry fixed-effects model			YES	Dependent variable-Probability of IPO failure-IPO failure in subsequent periods (dummy variable code 1 if IPO firms that delist from the stock exchange for negative reasons) Survivability-survival rates in subsequent periods; Independent variables- real activities earnings management (Roychowdhury,2006) and/or accruals earnings management (cross-sectional Jones, 1991); Control variables: size, IPO firm age, underwriter (1 if the IPO is underwritten by a prestigious underwriter), venture capitalists (1 if the firm is backed by a venture capitalists), Big N auditors, IPO under-pricing, offer price, leverage ratio, book-to-market ratio, ROA, absolute value of cash flows from operations.	IPO firms in the UK engage in real activities earnings management and/or accruals earnings management during the IPO year; IPO firms with high levels of real and/or accrual earnings management during the IPO year have a higher probability of IPO failure and lower survival rates in subsequent periods, where real activities earnings management has more server consequences
Cohen, D. A. & Zarowin, P.	2010	1987 - 2006	Probit; Heckman (1979) two-step procedure	YES			Trade-off between accruals and real earnings management: Dependent variable-real activities earnings management (dummy variable code as 1 if a firm's real earnings management proxy greater than the industry-year median real earnings management proxy and 0 otherwise). Independent variable (cost of accruals earnings management)- BIG8 auditors; auditor tenure; net operating assets; litigation Consequences: Dependent variable-post SEO changes in ROA; Independent variable-real earnings management (Roychowdhury, 2006) and accruals earnings management (cross-sectional Jones,1991) Control variables- the frequency of meeting/beating analysts' earnings forecasts; shares outstanding; bonus compensation; option compensation; ROA; leverage; market capitalisation; book to market ratio	First: it documents that firms use real and accruals earnings management methods around SEOs; Second, it finds that firms' choices differ predictably as a function of their ability to use accrual management and the costs of doing so; Third: the study finds that the post-SEO operating performance decline is attributable to real activities management is more severe than that attributable to accruals management

Appendix 1.2 (continued)								
Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Zang, A.	2012	1987–2008	Probit; Heckman (1979) two-step procedure	YES			<p>Dependent variables- real earnings management (Roychowdhury,2006) or accruals earnings management (cross-sectional Jones,1991);</p> <p>Independent variables: Cost of accruals earnings management-Big 8 auditors, auditor tenure, SOX, net operating assets, operating cycle, Cost of real activities earnings management- market leader status, financial health, institutional ownership, and marginal tax rates;</p> <p>Control variables-ROA, size, Market-to-book ratio, pre-managed earnings, inverse Mills ratio</p>	Managers use real activities earnings management and accruals earnings management substitutes based on the relative costs to their firms; If firms operate in an environment where the cost of real activities earnings management is high, then they will apply accruals earnings management more; If firms have high cost of accruals earnings management, then they will use real activities earnings management more
Cohen, D.A., Dey, A. & Lys, T.	2008	1987–2005	OLS	YES			<p>Dependent variable- real earnings management (Roychowdhury, 2006) or accruals earnings management (cross-sectional Jones,1991);</p> <p>Independent variables-before SOX periods (pre-SCA and SCA), after SOX periods, unexercised options, the number of unexercised options (excluding options grants in the current period), new option grants, restricted stock grants, average bonus compensation;</p> <p>Control variables-changes in GDP, market value of equity, big 5(4) auditors, time, accruals earnings management or real activities earnings management</p>	Subsequent to the passage of SOX, the level of real earnings management activities increased, the level of accrual-based earnings management decreased, and the total level of earnings management returned to the trend line of pre-SOX; Managers' option compensation is positively related to total level of earnings management

Appendix 1.2 (continued)								
Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Achleitner, A.K., Günther, N., Kaserer, C. & Siciliano, G.	2014	1998–2008	OLS with year fixed-effects	YES			<p>Usage of real earnings management and accruals earnings management among family firms: Dependent variables- real earnings management (Roychowdhury, 2006) or accruals earnings management (modified cross-sectional Jones, Dechow et al., 1995), Independent variables- two measurements for family firms: 1. family ownership 2. family firms (dummy variable code as one if family members are either on the management board and/or on the supervisory board of the firm, or hold at least 25% of voting rights)</p> <p>Use accruals and real earnings management alternatively: Dependent variable- real earnings management (Roychowdhury, 2006) Independent variables- the interaction between two measurements of family firms</p> <p>Control variables- current earnings losses, size, firms' growth rate, net income divided by average total assets, sum of all squared block-holdings, cumulative percentage of common shares held by members of the management board and the supervisory board that are not family members, leverage ratio, dummy that firms use GAAP, Big 4 auditors</p>	<p>Compared to non-family firms, family firms engage in more earnings decreasing accruals earning management and less real activities earnings management;</p> <p>Compared to non-family firms, family firms treat real activities earnings management and accruals earnings management substitutes</p>
Elshafie, E., Yen, A. & Yu, M.	2010	2001-2007	OLS and T-tests	YES			<p>Earnings management: dependent variables-DIFF (aggressive pro forma earnings reporting measured by difference between pro forma earnings and GAAP earnings, is a measure of pro forma reporting aggressiveness). Independent variables- Meet (meet earnings targets measured by dummy variable that has value of 1 if a firm meets its earnings targets and zero otherwise); accruals earnings management (measured by modified Jones model-Dechow et al. 1995); real activities earnings management (Roychowdhury, 2006);</p> <p>Control variables- Industry, Size, Growth (price-earnings ratio);</p> <p>Market ratio-dependent variable: stock price at the end of the following quarter. Independent variables: pro forma earnings per share, GAAP earnings per share, and book value per share</p>	<p>Meet earnings targets, accruals earnings management, and real activities earnings management are significantly negatively related to aggressive pro forma earnings reporting, suggesting that firms report aggressive pro forma earnings when they do not meet earnings targets or they have limited abilities to management earnings;</p> <p>Pro forma earnings value relevance is always higher than GAAP earnings regardless of whether firms are involved in high or low accruals earnings management. The relevance of GAAP earnings is higher for firms with higher levels of real activities</p>

Appendix 1.2 (continued)								
Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Black, E. L., Christensen, T.E., Joo, T.T., & Schmardebuck, R.	2014	1998-2006	logistic, OLS	YES			<p>Trad-offs strategy: Dependent variables-Aggressive pro forma reporting (Converting a GAAP operating loss to a pro forma profit; Using pro form exclusions to meet expectations when GAAP earnings fall short; the exclusion of recurring items),</p> <p>Independent variables-past earnings management (Balance Sheet Constraint following), current unmanaged earnings (net income-discretionary accruals), real earnings management measure following Roychowdhury (2006); discretionary accruals measure following modified Jones model- Kothari et al. (2005);</p> <p>Control variables-Accruals quality, negative analyst expectation, current statutory loss, special items, size, ROA, Leverage ratio, consecutive earnings increases over the past four years, management earnings guidance, company issued debt or equity during the year, company issued debt or equity within one year following the earnings announcement date, institutional ownership, BigN auditor, litigious industry;</p> <p>Market reactions: Dependent variable-CAR, Independent variables-interaction between pro forma earnings and past earnings management</p>	<p>Trade-offs strategy- past earnings management is positively and significantly related to aggressive pro forma reporting. Current unmanaged earnings, current real earnings management, current accruals-base earnings management are negatively and significantly associated with aggressive pro forma reporting;</p> <p>Market reactions-interaction between pro forma earnings and past earnings management is significantly negatively related to CAR</p>
Doyle, J., Jennings, J. & Soliman, M.	2013	1998 to 2009	Logistic, OLS	YES			<p>Meet earnings targets: Dependent variable- Meet earnings target (dummy variable code as '1' EPS minus the median consensus analyst forecast greater or equal to zero), Independent variable-income-increasing pro forma earnings exclusions (dummy variable code as '1' if management has pro forma earnings greater than GAAP earnings);</p> <p>Trade-off between earnings management: Dependent variable-pro forma exclusions level (total exclusions divided by price), Independent variable-accruals earnings management (modified Jones model, Kothari et al., 2005); real activities earnings management (Roychowdhury, 2006); expectations management (abnormal forecasts);</p> <p>Market reactions: Dependent variable-three-day market-adjusted buy-and-hold returns, Independent variables-income-increasing pro forma exclusions; the interaction of income-increasing pro forma exclusions and earnings surprise;</p> <p>Control variables -sales growth, size, profitable, ROA, market-to-book</p>	<p>Managers use within-GAAP earnings management and non-GAAP earnings management alternatively to meet earnings targets;</p> <p>Investors discount positive earnings surprises when accompanied by income-increasing exclusions from pro forma earnings, suggesting market partially understands the opportunistic nature of income-increasing exclusions</p>

Appendix 1.2 (continued)								
Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Badertscher, B. A.	2011	1997 to 2008	Fixed-effects, Probit, and 2SLS	YES			<p>Overvaluation and accruals earnings management: Dependent variable-Accruals earnings management (Cross-sectional modified Jones model, Kothari et al., 2005), Independent variables-Over (i, i=1to5) dummy variable equal to 1 if the firm has been in the top quintile of price-to-value ratio for (i) consecutive years. For example, Over 2 is equal to 1 if the firm is overvalued for two consecutive years; Specific controls for accruals earnings management-number of analysts, litigation risk industry, SEO;</p> <p>Overvaluation and real activities earnings management: Dependent variable- real activities earnings management (Roychowdhury 2006); Independent variables-Over (i, i=1to5) dummy variable; Specific controls for real earnings management-Herfindahl Index, market shares, Altman' Z-score; Overvaluation and non-GAAP earnings management: Dependent variable- non-GAAP firm dummy variable equals to 1 if firm with restatement announcements that raise questions about the quality of financial reporting, Independent variables-Over (i, i=1to5) dummy variable Specific controls for non-GAAP earnings management-book-tax differences; Corporate control variables-CEO's base salary, CEO's compensation, number of shares held by executives, number of option grants; General control variables- Net operating assets, Big 8 auditors, meet earnings targets, ROE, SOX, changes of GDP, Leverage ratio, size, firm's interest coverage ratio</p>	The longer a firm is overvalued, the greater is the amount of total earnings management; Managers engage in accruals management in the early stages of overvaluation and move to real transactions management to sustain their overvalued equity. The longer a firm is overvalued, the more likely it is to engage in non-GAAP earnings management
Chen, C. L., Huang, S. & Fan, H.	2012	1994–2010	2SLS (two-stage least squares regressions)		YES		<p>Model one: Dependent variable-real activities earnings management (Roychowdhury, 2006), Independent variables-accruals earnings management (cross-sectional Jones, 1991), Control variables-size, market-to-book, leverage, firm's earnings performance, net operating assets, insider's stocking holdings, firm's production capacity, intangible intensive industry, seasoned equity offerings.</p> <p>Model two: Dependent variable- accruals earnings management (cross-sectional Jones, 1991), Independent variables- real activities earnings management (Roychowdhury, 2006); Control variables-size, market-to-book, leverage, firm's earnings performance, net operating assets, insider's stocking holdings, firm's production capacity, intangible intensive industry, seasoned equity offerings, Big 4 auditors, accruals earnings management in previous year</p>	Real activities earnings management is positively associated with the accruals earnings management and supports that accruals and real activities earnings management play important roles in concurrently strategically boosting and/or suppressing firm's earnings in the relatively low accounting disclosure environment and low litigation costs settings found in Taiwan

Appendix 1.2 (continued)								
Authors	Year	Study Period	Method	Substitute	Complement	Unspecific	Test variables	Significant results
Sanjaya, P.S. & Saragih, M.F.	2012	2003 to 2007	OLS		YES		Dependent variable- Accruals earnings management (cross-sectional Jones, 1991); Independent variable- real activities earnings management (Roychowdhury, 2006); Control variables- Unexpected income before accruals earnings management, leverage ratio, firm's growth	Real activities manipulation is positively related to accruals earnings management suggesting that the increase of real activities manipulation result in the increasing accruals earnings management

Appendix 1.3: Literature review summary for paper three (The impacts of IC on firm's financial performance and market valuation)

Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP (Financial performance)	MV (Market valuation)		
Joshi, M., Cahill, D., Sidhu, J., & Kansal, M.	2013	2006-2008	K-S test; ANOVA test; OLS	VAIC TM	Partial positive		<p>Dependent variable – financial performance (average ROA);</p> <p>Independent variables-Average VAIC (value added intellectual coefficient); Average HCE (human capital efficiency); average CEE (capital employed efficiency); average SCE (structural capital efficiency);</p> <p>Control variables- firm size</p>	The financial performance of the financial sector in Australia is highly influenced by human capital efficiency, however high levels of capital and structural efficiencies do not necessarily lead to higher levels of financial performance
Chen, M., Cheng, S., & Hwang, Y	2005	1992-2002	OLS	VAIC TM	Positive	Positive	<p>Dependent variable- Firm's market valuation (MtoB); Firm's current and future financial performance (four variables-ROE, ROA, Growth in revenues, and Employee productivity);</p> <p>Independent variables-Firm's current market valuation and Firm's current financial performance (VAIC (value added intellectual coefficient), HCE (human capital efficiency), CEE (capital employed efficiency), and SCE (structural capital efficiency); Firm's future financial performance (lagged one-year, lagged two-year, and lagged three-year VAIC (value added intellectual coefficient), HCE (human capital efficiency), CEE (capital employed efficiency), and SCE (structural capital efficiency);</p> <p>Control variables-R&D expenditures and advertising expenditures</p>	<p>Firm's market valuation: VAIC, HCE, CEE and SCE are positively and significantly related to MtoB;</p> <p>Firm's current financial performance: VAIC, HCE and CEE are positively and significantly related to ROE, ROA, Growth in revenues, and Employee productivity; SCE is positively and significantly related to ROA;</p> <p>Firm's future financial performance: lagged VAIC, HCE and CEE are positively and significantly related to ROE, ROA, Growth in revenues, and Employee productivity. Lagged SCE is positively and significantly related to ROA</p>

Appendix 1.3 (continued)								
Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP	MV		
Vafaei, A., Taylor, D. & Ahmed, K.	2011	2005-2006	Content analysis; OLS	COB -SC		Partial positive	Dependent variables- Share price three months after the balance date; Independent variables- Value relevance: EPS, BVPS (the book value of net assets per share), and IC; Incremental value relevance: EPS (the net profit or loss after tax per share), BVPS (the book value of net assets per share), IC, BVPSDIF (the difference between BVPS determined under GAAP and under IFRS), and EPSDIF (the difference between EPS determined under GAAP and under IFRS); Moderating effects of IC- BVPS, EPS, IC, BVPSDIF, EPSDIF, BVPSDIF*IC (the interaction between BVPSDIF and IC), and EPSDIF*IC (the interaction between EPSDIF and IC); Control variable- Industry type (dummy variable code as one if a firm in non-traditional industry)	Value relevance of IC: IC is positively related to share price for Hong Kong and Britain, however, it is significantly neither Singapore nor Australia; Incremental value relevance: share price is not significantly associated with BVPSDIF and EPSDIF, suggesting that IFRS adjustment amounts are not value relevant; Moderating effects of IC: The interaction between EPSDIF and IC as well as the interaction between BVPSDIF and IC are significantly positively for Britain
Phusavat, K.,Comepa, N., Sitko-Lutek, A. & Keng-Boon, O.	2011	2006-2009	OLS	VAIC TM	Positive		Dependent variables- firm's performance - ROE, ROA, growth in revenues, and employee productivity; Independent variables- VAIC (value added capital coefficient), VAHC (human capital efficiency), VACE (capital employed efficiency), and SCVA (structural capital efficiency), InCE (innovation capital); Control variables- None	VAIC is positively related to four firm performance indicators (ROE, ROA, growth in revenues, and employee productivity); VACE is positively related to ROE and ROA; VAHC is positively related to ROA; In CE is positively related to growth in revenues
Abeysekera, I.	2011b	1998 to 2003	Content analysis, Fixed effect	COB-SC		None	Dependent variables-current stock returns; Independent variables-the frequency of IC disclosures (internal capital with ten components, external capital with ten components, human capital with twenty five components), earnings per share for year t-1, earnings per share for year t, the sum of earnings per share for years t+1, t+2, and t+3, interactions between IC disclosures and earnings variables; Control variables- sum of annual stock returns for years t+1, t+2, and t+3, Market to book value, Size	IC had no significant correlation with the current stock return and had no effect on accounting based earnings included in the current stock return, indicating that investors disregarded their interaction impact

Appendix 1.3 (continued)								
Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP	MV		
Kim, S. H. & Taylor, D.	2014	2006-2010	Fixed-effects; Hand collection	COB - DIC		Positive	<p>Dependent variable- share price three months later at the end of fiscal year;</p> <p>Independent variables-Productivity of book-value assets- Book-value per share (BVPS); interaction between BVPS and ROE; interaction between value added divided by book-value total assets and BVPS; Productivity of IC-Book-value per share (BVPS); interaction between BVPS and ROE; interaction between value added divided by IC (or its two components human capital and structural capital) and BVPS;</p> <p>Control variables- year (code as 1 if year 2008 or year 2009, 0 otherwise) and industry (code as 1 if firm is in high-tech industry, 0 otherwise)</p>	<p>The productivity of IC and its human and structural capital components are each positively associated with share price, whereas the productivity of book value of total assets is non-significant;</p> <p>Year is negatively related to share price and industry is insignificant associated with share price</p>
Ferraro, O. & Veltri, S.	2011	2006-2008	Fixed-effects; Survey	COB -SC		Partial positive	<p>Dependent variable- stock price of company at 3 month later than the financial year;</p> <p>Independent variables- Book value per share (BVPS); EPS; Intellectual capital includes HC, RC, PC, and InC. Where: Human capital (HC) measured by salaries and benefit expenses per share; Relation Capital (RC) measured by sales per share; Process Capital (PC) measured by Selling, General & Administration expenses per share. Innovation capital (InC) measured by intangible assets per share;</p> <p>Control variables- Total asset per share</p>	The traditional accounting variables (BVPS and EPS) are value relevant for investors. With relations to the main IC effects, investors price only relational capital
Gamerschlag, R.	2013	2005-2008	Content analysis; OLS	COB -SC		Positive	<p>Dependent variable- market valuation-stock price, Market changes valuation-stock returns;</p> <p>Independent variables- market valuation-human capital total index (qualification/competence index and motivation/commitment index and personnel index), book value per share, earnings per share, Market changes valuation- changes of human capital total index (changes of qualification/competence index and changes of motivation/commitment index and changes of personnel index), earnings per share, changes of earnings per share;</p> <p>Control variables-year and industry dummy</p>	Human capital index is significant positively related to stock price, while it is not associated with stock returns, suggesting that human capital information is value relevant, but not immediately

Appendix 1.3 (continued)								
Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP	MV		
Clarke, M., Seng, D. & Whiting, R. H.	2011	2004-2008	OLS;ANOVA	VAIC TM	Positive		Dependent variables- firm's performance (ROE, ROA, growth in revenues, and employee productivity); Independent variables- VAIC (value added capital coefficient), HCE (human capital efficiency), CEE (capital employed efficiency), and SCE (structural capital efficiency/lagged VAIC (value added capital coefficient), lagged HCE (human capital efficiency), lagged CEE (capital employed efficiency), and lagged SCE (structural capital efficiency); Control variables- Leverage, Research intensive, year, industry	Positive relationship between VAIC and firm's performance; particularly with CEE and HCE. Positive relationship between lagged HCE and lagged SCE and firm's current performance
Tan, H.P., Plowman, D. & Hancock, P.	2007	2000-2002	ANOVA, PLS least squares)	VAIC TM	Positive		Dependent variable-Firm's current financial performance (ROE, EPS, and annual stock returns in year t); Firm's future financial performance (ROE, EPS, and annual stock returns in year t+1); Independent variables-VACA (value added capital coefficient), VAHU (human capital coefficient), STVA (structural capital coefficient) in year t; Control variables- industry type (Manufacturing related, trading related, services related and property related)	Positive correlation between a firm's IC and company performance; Positive relationship between increased value of a firm's IC and that company's future performance; Positive correlation between the rate of growth of a firm's IC and that company's future performance; The results indicate a higher contribution of IC to companies in the Services and Property sector, less in the Manufacturing sector and even less in the Trading sector.
Al-Twaijry, A.	2009	2001-2005	OLS	COB - DIC	Partial positive		The influence of investment in intangible assets on firms' future growth: dependent variables- the change in the company's annual sales ($Growth_{it}$); change in the company's annual operating earnings; change in the company's annual market values; Independent variables-annual change in the investments in intangible (ΔITA_{it-1} ; ΔITA_{it-2} ; ΔITA_{it-3} ; ΔITA_{it-4}); The factors that influence on the investment in intangible assets: dependent variables-Investments in intangible (ITA_{it}); annual change in the investments in intangible(ΔITA_{it}); Independent variables-Firm size; industry sectors; firm age; financial status measured by company leverage, growth is the growth in profit measured by changes in sales; dividends per share; natural logarithm of net cash flow	Investment in intangible is not always positively associated with near future growth; Firm size; industry sectors; financial status measured by company leverage, growth is the growth in profit measured by changes in sales; dividends per share; natural logarithm of net cash flow were significantly related to investment on intangible assets but firm's age was not; The results suggest that while investing in intangible assets doesn't lead directly to future growth, these investments are affected by a number of variables

Appendix 1.3 (continued)								
Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP	MV		
Maditinos, D., Chatzoudes, D., Tsairidis, C., Theriou, G.	2011	2006-2008	OLS	VAIC TM	Partial positive	None	<p>Market value: dependent variable- Market to book ratio; Independent variables-VACA (indicator of value added efficiency of capital employed); VAHU (indicator of value added efficiency of human capital); STVA (indicator of value added efficiency of structural capital); VAIC (the composite sum of the three separate indicators).</p> <p>Financial performance: dependent variables- ROE (return on equity), or ROA (return on assets), or GR (growth revenues); Independent variables- VACA (indicator of value added efficiency of capital employed); VAHU (indicator of value added efficiency of human capital); STVA (indicator of value added efficiency of structural capital); VAIC (the composite sum of the three separate indicators).</p>	There is a statistically significant positive relationship between human capital efficiency and financial performance only.
Kamath, G.	2008	1996 - 2006	OLS	VAIC TM	Partial positive	None	<p>Dependent variables- ROA to reflect profitability, MtoB to reflect market valuation and ATO to reflect productivity (measured by total revenue to the book value total assets);</p> <p>Independent variables- VACA (indicator of value added efficiency of capital employed); VAHU (indicator of value added efficiency of human capital); SCVA (indicator of value added efficiency of structural capital); VAIC (the composite sum of the three separate indicators);</p> <p>Control variables- Leverage and firm size (market capitalisation)</p>	<p>None of the independent variables individually explain and have a significant impact on the ROA, MtoB and ATO;</p> <p>However, the correlation analysis provided a slight indication that human assets are more important than the physical and structural assets in Indian pharmaceutical industry's profitability and productivity</p>
Chan, K.H.	2009b	2001 - 2005	OLS	VAIC TM	Partial positive	None	<p>The dependent variables- market valuation (MtoB), profitability (ROA), productivity (ATO revenue to book value total assets) and return on equity (ROE);</p> <p>Independent variables-structural capital efficiency (SCE), human capital efficiency (HCE), and physical capital efficiency (CEE); VAIC (the composite sum of the three separate indicators);</p> <p>Control variables- firm size and leverage</p>	<p>VAIC is positively associated with profitability; is weakly related to return on equity; no statistical association with market valuation;</p> <p>Physical capital employed has been found to be positively associated with market valuation, productivity and profitability;</p> <p>This empirical finding clearly demonstrates that physical capital, among the three individual IC components, has the greatest impact on financial performance in the firms surveyed</p>

Appendix 1.3 (continued)								
Authors	Year	Study Period	Method	IC measures	Purpose		Test Variables	Significant Results
					FP	MV		
Tseng, C. & Goo, J.	2005	2000	Questionnaire, SEM using AMOS program	COB -SC	Positive	Positive	Dependent variable- corporate value (Market to Book value; Tobin'q and Value Added Intellectual Coefficient in year t; Independent variables- human capital, organizational capital, innovation capital and relationship capital as four constructs of intellectual capital; Control variables- None	Positive relationship between IC and corporate value
Firer, S. & Williams, S.M.	2003	2001	OLS	VAIC TM	Mixed	Mixed	Dependent variables-ROA, ATO, MtoB; Independent variables- Human capital efficiency (HCE); Capital employed efficiency (CEE); Structural capital efficiency (SCE); Controls-size, leverage, industry, ROE	SCE is positive significant related to profitability; CEE is positively significant related to market valuation; HCE is negatively significant related to productivity and market valuation
Ghosh, S. & Mondal, A.	2009	2002 to 2006	OLS	VAIC TM	Partial positive	None	Dependent variables-ROA, ATO, MtoB; Independent variables-Capital employed efficiency (CEE); Human capital efficiency (HCE); Structural capital efficiency (SCE); Controls-size, leverage, industry, Physical capital intensity	IC performance is positively related to profitability but not productivity and market valuation.
Abdolmohammadi, M. J.	2005	1993 to 1997	Content analysis, OLS	COB -SC		Positive	Dependent variables-Logarithm of market capitalisation; Independent variables-the frequency of IC disclosures (internal capital with six components, external capital with seven components, human capital with five components), logarithm of book value, difference between a firm's ROA and its industry average; Controls-None	IC is positively significantly related to market values
Abeysekera, I.	2011a	1998 to 2004	Content analysis, Fixed effect	COB -SC		Partial positive	Dependent variables-Logarithm of market value of equity; Independent variables-the frequency of narrative IC disclosures (IC is measured by 45 items), the frequency of visual IC disclosures, the frequency of numerical IC disclosures, Interaction of narrative, visual, and numerical IC disclosures, logarithm of book value, Logarithm of income; Control variables- Size, Market to book, Leverage	During the civil war (from 1998-2000), the current market value of equity is positively related to current earnings and net book value , and has no relations to visual, narrative, or numerical IC disclosure; During the period of temporary truce (2002-2004), the current market value of equity is positively associated with current earnings, net book value, and narrative disclosure, but not related to numerical or visual IC disclosure

Appendix 2: Underlying earnings reporting adjustments, impacts of underlying earnings on statutory earnings, and underlying earnings reporting locations

Year	ASX code	Company name	GICSIndustry sector	Underlying earnings adjustments									Underlying earnings reporting location								Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss	
2009	BHP	BHP Billiton Limited	Materials		√	√							√		√					√						
2010	BHP	BHP Billiton Limited	Materials		√	√					√		√		√		√						√			
2011	BHP	BHP Billiton Limited	Materials	√							√		√		√					√						
2012	BHP	BHP Billiton Limited	Materials	√									√		√					√						
2010	TLS	Telstra Corporation Limited	Telecommunication Services	√		√							√							√						
2012	TLS	Telstra Corporation Limited	Telecommunication Services	√														√		√						
2009	WOW	Woolworths Limited	Consumer Staples									√		√									√			
2010	WOW	Woolworths Limited	Consumer Staples									√		√									√			
2011	WOW	Woolworths Limited	Consumer Staples									√		√									√			
2012	WOW	Woolworths Limited	Consumer Staples									√		√									√			
2010	WES	Wesfarmers Limited	Consumer Staples									√	√							√						
2009	WPL	Woodside Petroleum Limited	Energy	√	√								√					√		√						
2010	WPL	Woodside Petroleum Limited	Energy	√	√					√			√					√					√			
2011	WPL	Woodside Petroleum Limited	Energy		√				√				√							√						
2012	WPL	Woodside Petroleum Limited	Energy		√				√						√	√							√			
2009	CSL	CSL Limited	Health Care						√	√			√					√					√			
2009	RIO	Rio Tinto Limited	Materials	√	√	√				√			√		√		√	√		√						
2010	RIO	Rio Tinto Limited	Materials	√	√	√				√	√		√		√		√	√					√			
2011	RIO	Rio Tinto Limited	Materials	√	√	√				√	√		√		√		√	√		√						
2012	RIO	Rio Tinto Limited	Materials	√	√	√				√	√		√		√		√	√			√					
2009	NCM	Newcrest Mining Limited	Materials			√				√			√	√	√		√			√						
2010	NCM	Newcrest Mining Limited	Materials			√				√			√	√						√						
2011	NCM	Newcrest Mining Limited	Materials			√				√			√							√						
2012	NCM	Newcrest Mining Limited	Materials		√	√	√				√		√	√									√			
2009	ORG	Origin Energy Limited	Energy	√			√	√		√			√	√	√	√	√	√					√			
2010	ORG	Origin Energy Limited	Energy	√	√		√	√		√			√	√	√	√	√	√					√			

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments										Underlying earnings reporting location						Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition on transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	ORG	Origin Energy Limited	Energy	√	√		√	√		√			√	√	√	√	√			√					
2012	ORG	Origin Energy Limited	Energy	√						√			√	√	√	√	√						√		
2009	BXB	Brambles Limited	Industrials			√	√		√				√		√		√			√					
2010	BXB	Brambles Limited	Industrials			√	√						√		√		√			√					
2011	BXB	Brambles Limited	Industrials			√	√							√	√	√	√			√					
2012	BXB	Brambles Limited	Industrials			√	√		√					√	√	√	√			√					
2010	FMG	Fortescue Metals Group Ltd	Materials									√				√							√		
2009	STO	Santos Limited	Energy	√	√			√	√	√			√	√		√							√		
2010	STO	Santos Limited	Energy	√	√			√	√	√			√	√		√							√		
2011	STO	Santos Limited	Energy	√	√			√	√	√			√	√		√							√		
2012	STO	Santos Limited	Energy	√	√			√	√	√			√	√		√				√					
2009	AMC	Amcor Limited	Materials	√	√	√	√	√							√					√					
2010	AMC	Amcor Limited	Materials	√	√	√	√	√							√					√					
2011	AMC	Amcor Limited	Materials	√	√	√	√	√							√					√					
2012	AMC	Amcor Limited	Materials	√	√	√	√	√							√					√					
2009	CCL	Coca-Cola Amatil Limited	Consumer Discretionary									√		√										√	
2010	CCL	Coca-Cola Amatil Limited	Consumer Discretionary									√		√										√	
2011	CCL	Coca-Cola Amatil Limited	Consumer Discretionary									√		√									√		
2012	CCL	Coca-Cola Amatil Limited	Consumer Discretionary	√	√									√						√					
2009	OSH	Oil Search Limited	Energy	√	√												√						√		
2010	OSH	Oil Search Limited	Energy	√	√												√			√					
2011	OSH	Oil Search Limited	Energy	√	√			√									√			√					
2012	OSH	Oil Search Limited	Energy	√	√			√									√			√					
2009	TCL	Transurban Group	Industrials									√	√							√					
2010	TCL	Transurban Group	Industrials									√		√						√					
2011	TCL	Transurban Group	Industrials									√		√						√					
2012	TCL	Transurban Group	Industrials									√		√						√					
2009	ORI	Orica Limited	Materials	√		√	√									√				√					
2010	ORI	Orica Limited	Materials				√	√			√					√				√					
2011	ORI	Orica Limited	Materials							√						√							√		
2012	ORI	Orica Limited	Materials	√												√				√					
2009	CWN	Crown Resorts Limited	Consumer Discretionary									√		√							√				
2010	CWN	Crown Resorts Limited	Consumer Discretionary									√		√									√		

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments										Underlying earnings reporting location						Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	CWN	Crown Resorts Limited	Consumer Discretionary									√		√						√					
2012	CWN	Crown Resorts Limited	Consumer Discretionary									√		√									√		
2009	AGL	AGL Energy Limited	Utilities									√	√										√		
2010	AGL	AGL Energy Limited	Utilities									√	√							√					
2011	AGL	AGL Energy Limited	Utilities									√	√										√		
2012	AGL	AGL Energy Limited	Utilities									√	√							√					
2009	RHC	Ramsay Health Care Limited	Health Care					√		√			√							√					
2010	RHC	Ramsay Health Care Limited	Health Care					√		√					√					√					
2011	RHC	Ramsay Health Care Limited	Health Care					√		√			√							√					
2012	RHC	Ramsay Health Care Limited	Health Care					√		√						√				√					
2010	SYD	Sydney Airport	Industrials	√				√					√		√					√					
2011	WOR	WorleyParsons Limited	Energy	√	√								√										√		
2012	WOR	WorleyParsons Limited	Energy	√	√								√										√		
2009	CTX	Caltex Australia Limited	Energy			√	√	√					√							√					
2010	CTX	Caltex Australia Limited	Energy			√	√						√							√					
2011	CTX	Caltex Australia Limited	Energy	√		√				√			√								√				
2012	CTX	Caltex Australia Limited	Energy				√				√		√							√					
2009	CPU	Computershare Limited	Software & Services	√	√	√								√									√		
2010	CPU	Computershare Limited	Software & Services	√	√	√								√									√		
2011	CPU	Computershare Limited	Software & Services	√	√	√					√			√						√					
2012	CPU	Computershare Limited	Software & Services	√	√		√				√			√						√					
2009	AIO	Asciano Limited	Industrials	√		√												√						√	
2010	AIO	Asciano Limited	Industrials	√	√	√		√										√	√						
2011	AIO	Asciano Limited	Industrials									√						√						√	
2012	AIO	Asciano Limited	Industrials	√	√	√								√									√		
2009	IPL	Incitec Pivot Limited	Materials	√		√		√			√						√				√				
2010	IPL	Incitec Pivot Limited	Materials				√				√						√			√					
2011	IPL	Incitec Pivot Limited	Materials		√	√											√			√					
2012	IPL	Incitec Pivot Limited	Materials	√							√						√						√		
2009	APA	APA Group	Utilities	√	√		√	√			√						√			√					
2010	APA	APA Group	Utilities									√					√							√	
2009	FBU	Fletcher Building Limited	Materials	√		√							√	√	√	√					√				
2010	FBU	Fletcher Building Limited	Materials					√					√	√	√	√	√			√					

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	FBU	Fletcher Building Limited	Materials	√			√			√			√							√					
2012	FBU	Fletcher Building Limited	Materials	√		√										√				√					
2009	JHX	James Hardie Industries Plc	Materials	√						√				√	√								√		
2010	JHX	James Hardie Industries Plc	Materials	√										√	√						√				
2011	JHX	James Hardie Industries Plc	Materials									√		√	√					√					
2012	JHX	James Hardie Industries Plc	Materials									√			√					√					
2009	TTS	Tatts Group Limited	Consumer Discretionary	√										√						√					
2010	TTS	Tatts Group Limited	Consumer Discretionary	√		√										√				√					
2011	TTS	Tatts Group Limited	Consumer Discretionary				√			√	√					√				√					
2012	TTS	Tatts Group Limited	Consumer Discretionary				√			√	√						√			√					
2009	TOL	Toll Holdings Limited	Industrials									√		√		√				√					
2011	TOL	Toll Holdings Limited	Industrials									√		√									√		
2012	TOL	Toll Holdings Limited	Industrials	√							√			√						√					
2009	QAN	Qantas Airways Limited	Industrials	√	√	√					√						√			√					
2010	QAN	Qantas Airways Limited	Industrials				√									√				√					
2011	QAN	Qantas Airways Limited	Industrials	√		√				√						√				√					
2012	QAN	Qantas Airways Limited	Industrials	√		√				√						√					√				
2009	ILU	Iluka Resources Limited	Materials	√											√							√			
2010	ILU	Iluka Resources Limited	Materials	√											√									√	
2009	BLD	Boral Limited	Materials	√	√			√					√			√							√		
2010	BLD	Boral Limited	Materials	√		√		√					√			√					√				
2011	BLD	Boral Limited	Materials	√	√		√	√					√			√				√					
2012	BLD	Boral Limited	Materials	√	√	√	√	√					√			√							√		
2011	MTS	Metcash Limited	Consumer Staples	√	√			√			√								√	√					
2012	MTS	Metcash Limited	Consumer Staples	√	√			√			√								√	√					
2009	ALQ	ALS Limited	Industrials									√	√											√	
2010	ALQ	ALS Limited	Industrials									√		√						√					
2011	ALQ	ALS Limited	Industrials	√	√			√					√										√		
2012	ALQ	ALS Limited	Industrials	√	√			√						√						√					
2009	SEK	SEEK Limited	Industrials	√									√	√						√					
2010	SEK	SEEK Limited	Industrials	√									√	√									√		
2011	SEK	SEEK Limited	Industrials	√									√	√									√		
2012	SEK	SEEK Limited	Industrials	√									√	√									√		

				Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
Year	ASX code	Company name	GICSIndustry sector	Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	FLT	Flight Centre Travel Group Limited	Consumer Discretionary									√	√							√					
2012	FLT	Flight Centre Travel Group Limited	Consumer Discretionary									√	√							√					
2009	SPK	Spark New Zealand Limited	Telecommunication Services	√	√			√	√						√					√					
2010	SPK	Spark New Zealand Limited	Telecommunication Services	√	√			√	√						√									√	
2011	SPK	Spark New Zealand Limited	Telecommunication Services	√	√			√	√						√						√				
2012	SPK	Spark New Zealand Limited	Telecommunication Services	√	√			√	√						√								√		
2009	AWC	Alumina Limited	Materials									√	√									√			
2010	AWC	Alumina Limited	Materials									√	√							√					
2011	AWC	Alumina Limited	Materials									√	√							√					
2012	AWC	Alumina Limited	Materials									√	√									√			
2010	SVW	Seven Group Holdings Limited	Industrials									√			√								√		
2011	SVW	Seven Group Holdings Limited	Industrials	√	√		√	√							√					√					
2012	SVW	Seven Group Holdings Limited	Industrials	√	√		√	√							√					√					
2009	HVN	Harvey Norman Holdings Ltd	Consumer Discretionary	√	√			√			√		√							√					
2010	HVN	Harvey Norman Holdings Ltd	Consumer Discretionary	√	√			√			√		√							√					
2009	BSL	BlueScope Steel Limited	Materials									√			√						√				
2010	BSL	BlueScope Steel Limited	Materials									√			√								√		
2011	BSL	BlueScope Steel Limited	Materials	√		√				√									√			√			
2012	BSL	BlueScope Steel Limited	Materials	√	√	√	√	√								√						√			
2009	DUE	DUET Group	Utilities	√									√									√			
2010	DUE	DUET Group	Utilities	√					√				√										√		
2011	DUE	DUET Group	Utilities	√					√								√						√		
2012	DUE	DUET Group	Utilities	√				√	√								√						√		
2012	GNC	Graincorp Limited	Consumer Staples				√	√							√								√		
2012	TPM	TPG Telecom Limited	Telecommunication Services					√								√				√					
2009	PRY	Primary Health Care Limited	Health Care									√			√					√					
2010	PRY	Primary Health Care Limited	Health Care									√			√									√	
2011	PRY	Primary Health Care Limited	Health Care									√			√					√					
2012	SUL	Super Retail Group Limited	Consumer Discretionary				√							√		√				√					
2009	TAH	Tabcorp Holdings Limited	Consumer Discretionary									√					√						√		
2010	TAH	Tabcorp Holdings Limited	Consumer Discretionary									√					√			√					
2011	TAH	Tabcorp Holdings Limited	Consumer Discretionary	√													√			√					

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transactions on costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2012	TAH	Tabcorp Holdings Limited	Consumer Discretionary									√	√							√					
2009	SKI	Spark Infrastructure Group	Utilities	√				√						√						√					
2010	SKI	Spark Infrastructure Group	Utilities	√				√						√									√		
2011	SKI	Spark Infrastructure Group	Utilities				√	√						√						√					
2012	SKI	Spark Infrastructure Group	Utilities				√	√						√										√	
2009	WHC	Whitehaven Coal Limited	Energy		√	√	√	√								√							√		
2010	WHC	Whitehaven Coal Limited	Energy		√	√	√	√			√					√							√		
2011	WHC	Whitehaven Coal Limited	Energy		√			√		√	√					√				√					
2012	WHC	Whitehaven Coal Limited	Energy	√	√			√	√	√	√		√										√		
2010	DOW	Downer EDI Limited	Industrials	√	√	√		√			√			√						√					
2011	DOW	Downer EDI Limited	Industrials									√		√							√				
2012	DOW	Downer EDI Limited	Industrials	√	√						√			√						√					
2009	ANN	Ansell Limited	Health Care	√							√		√										√		
2009	MND	Monadelphous Group Limited	Industrials									√						√					√		
2012	MND	Monadelphous Group Limited	Industrials	√				√	√									√					√		
2009	ALL	Aristocrat Leisure Limited	Consumer Discretionary						√						√						√				
2010	ALL	Aristocrat Leisure Limited	Consumer Discretionary	√	√	√				√					√								√		
2011	ALL	Aristocrat Leisure Limited	Consumer Discretionary	√	√	√				√				√	√								√		
2012	ALL	Aristocrat Leisure Limited	Consumer Discretionary					√	√						√					√					
2009	SWM	Seven West Media Limited	Consumer Discretionary								√		√							√					
2010	SWM	Seven West Media Limited	Consumer Discretionary									√	√										√		
2011	SWM	Seven West Media Limited	Consumer Discretionary				√										√			√					
2012	SWM	Seven West Media Limited	Consumer Discretionary									√					√			√					
2009	MIN	Mineral Resources Limited	Industrials									√				√				√					
2010	MIN	Mineral Resources Limited	Industrials									√		√									√		
2009	AIX	Australian Infrastructure Fund Limited	Industrials									√	√							√					
2010	AIX	Australian Infrastructure Fund Limited	Industrials	√						√			√										√		
2011	AIX	Australian Infrastructure Fund Limited	Industrials	√									√										√		

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2012	AIX	Australian Infrastructure Found Limited	Industrials	√		√				√			√							√					
2009	BPT	Beach Energy Limited	Energy	√				√	√				√										√		
2010	BPT	Beach Energy Limited	Energy	√				√	√							√				√					
2011	BPT	Beach Energy Limited	Energy	√	√		√	√					√								√				
2012	BPT	Beach Energy Limited	Energy	√	√		√	√					√										√		
2009	UGL	UGL Limited	Industrials								√		√							√					
2010	UGL	UGL Limited	Industrials									√				√				√					
2011	UGL	UGL Limited	Industrials			√	√	√			√		√							√					
2012	UGL	UGL Limited	Industrials			√	√	√			√		√							√					
2009	ENV	Envestra Limited	Utilities									√		√		√							√		
2010	ENV	Envestra Limited	Utilities									√		√		√							√		
2011	ENV	Envestra Limited	Utilities									√		√		√				√					
2009	DLX	DuluxGroup Limited	Materials				√						√								√				
2010	DLX	DuluxGroup Limited	Materials					√					√							√					
2011	DLX	DuluxGroup Limited	Materials							√			√										√		
2012	OZL	OZ Minerals Limited	Materials	√						√				√										√	
2009	DJS	David Jones Limited	Consumer Discretionary									√		√										√	
2010	DJS	David Jones Limited	Consumer Discretionary									√		√										√	
2011	DJS	David Jones Limited	Consumer Discretionary									√		√										√	
2012	DJS	David Jones Limited	Consumer Discretionary									√		√										√	
2012	QUB	Qube Holdings Limited	Industrials									√				√					√				
2009	TPI	Transpacific Industries Group Ltd	Industrials									√	√								√				
2010	TPI	Transpacific Industries Group Ltd	Industrials									√	√										√		
2011	TPI	Transpacific Industries Group Ltd	Industrials	√	√	√		√		√	√		√								√				
2012	TPI	Transpacific Industries Group Ltd	Industrials	√	√	√		√		√	√		√							√					
2009	PNA	PanAust Limited	Materials									√		√									√		
2010	PNA	PanAust Limited	Materials									√		√						√					
2011	PNA	PanAust Limited	Materials	√							√								√	√					
2012	PNA	PanAust Limited	Materials	√		√					√								√	√					
2009	FXJ	Fairfax Media Limited	Consumer Discretionary	√		√		√						√							√				
2010	FXJ	Fairfax Media Limited	Consumer Discretionary	√		√				√	√			√						√					

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition on transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	FXJ	Fairfax Media Limited	Consumer Discretionary	√		√		√		√						√					√				
2012	FXJ	Fairfax Media Limited	Consumer Discretionary	√		√	√	√		√						√					√				
2012	AUT	Aurora Oil & Gas Limited	Energy	√											√						√				
2011	JBH	JB HI-FI Limited	Consumer Discretionary			√							√	√							√				
2010	GFF	Goodman Fielder Limited	Consumer Staples		√	√				√	√			√							√				
2011	GFF	Goodman Fielder Limited	Consumer Staples									√				√					√				
2012	GFF	Goodman Fielder Limited	Consumer Staples	√		√		√	√					√							√				
2009	IVC	InvoCare Limited	Consumer Discretionary									√				√							√		
2010	IVC	InvoCare Limited	Consumer Discretionary									√			√						√				
2011	IVC	InvoCare Limited	Consumer Discretionary									√	√								√				
2012	IVC	InvoCare Limited	Consumer Discretionary									√	√								√				
2009	ARI	Arrium Limited	Materials			√		√					√										√		
2010	ARI	Arrium Limited	Materials			√		√		√	√		√										√		
2011	ARI	Arrium Limited	Materials	√		√	√	√		√					√						√				
2012	ARI	Arrium Limited	Materials	√		√	√	√		√					√						√				
2009	SXL	Southern Cross Media Group Limited	Consumer Discretionary									√	√			√					√				
2010	SXL	Southern Cross Media Group Limited	Consumer Discretionary									√	√									√			
2011	SXL	Southern Cross Media Group Limited	Consumer Discretionary									√	√	√		√					√				
2012	SXL	Southern Cross Media Group Limited	Consumer Discretionary									√		√									√		
2012	LYC	Lynas Corporation Limited	Materials	√							√				√							√			
2009	CSR	CSR Limited	Materials									√				√					√				
2010	CSR	CSR Limited	Materials							√	√		√								√				
2011	CSR	CSR Limited	Materials	√		√		√		√	√				√								√		
2012	CSR	CSR Limited	Materials		√	√		√			√		√										√		
2011	NUF	Nufarm Limited	Materials	√						√	√			√							√				
2012	NUF	Nufarm Limited	Materials	√		√		√	√		√		√								√				
2012	EVN	Evolution Mining Limited	Materials									√	√								√				
2009	VAH	Virgin Australia Holdings Limited	Industrials		√		√		√								√				√				
2010	VAH	Virgin Australia Holdings Limited	Industrials									√			√									√	
2011	VAH	Virgin Australia Holdings Limited	Industrials									√	√									√			
2012	VAH	Virgin Australia Holdings Limited	Industrials									√	√											√	

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments										Underlying earnings reporting location						Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition on transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2012	AGO	Atlas Iron Limited	Materials			√								√							√				
2009	IRE	IRESS Limited	Software & Services									√	√							√					
2010	IRE	IRESS Limited	Software & Services									√	√							√					
2011	IRE	IRESS Limited	Software & Services									√	√							√					
2012	IRE	IRESS Limited	Software & Services									√	√							√					
2009	BRS (TSE)	Broadspectrum Limited	Industrials									√	√								√				
2010	BRS	Broadspectrum Limited	Industrials									√	√							√					
2011	BRS	Broadspectrum Limited	Industrials	√	√	√	√	√	√					√							√				
2012	BRS	Broadspectrum Limited	Industrials									√		√										√	
2012	IGO	Independence Group NL	Materials									√	√										√		
2009	ASL	Ausdrill Limited	Industrials									√			√					√					
2010	SIP	Sigma Pharmaceuticals Limited	Health Care									√				√					√				
2012	SIP	Sigma Pharmaceuticals Limited	Health Care									√		√						√					
2009	RSG	Resolute Mining Limited	Materials									√	√	√						√					
2010	RSG	Resolute Mining Limited	Materials									√	√	√							√				
2009	IIN	iiNET Limited	Telecommunication Services									√		√									√		
2010	IIN	iiNET Limited	Telecommunication Services									√		√						√					
2011	IIN	iiNET Limited	Telecommunication Services			√		√								√				√					
2012	IIN	iiNET Limited	Telecommunication Services		√		√	√						√						√					
2009	SKE	Skilled Group Limited	Industrials									√	√							√					
2010	SKE	Skilled Group Limited	Industrials	√		√	√				√		√							√					
2011	SKE	Skilled Group Limited	Industrials	√		√	√				√				√					√					
2012	SKE	Skilled Group Limited	Industrials									√	√							√					
2009	TEN	Ten Network Holdings Limited	Consumer Discretionary	√				√			√			√									√		
2010	TEN	Ten Network Holdings Limited	Consumer Discretionary					√					√										√		
2010	MML	Medusa Mining Ltd	Materials									√	√							√					
2009	PBG	Pacific Brands Limited	Consumer Discretionary	√	√	√				√	√				√						√				
2010	PBG	Pacific Brands Limited	Consumer Discretionary	√	√	√				√	√				√					√					
2011	PBG	Pacific Brands Limited	Consumer Discretionary	√	√	√				√	√				√						√				
2012	PBG	Pacific Brands Limited	Consumer Discretionary	√	√	√	√			√	√				√						√				
2009	MTU	M2 Group Ltd	Telecommunication Services									√		√						√					
2010	MTU	M2 Group Ltd	Telecommunication Services									√		√						√					

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments										Underlying earnings reporting location						Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2011	MTU	M2 Group Ltd	Telecommunications Services									√		√						√					
2009	GWA	GWA Group Limited	Industrials			√											√			√					
2010	GWA	GWA Group Limited	Industrials									√	√							√					
2012	GWA	GWA Group Limited	Industrials			√							√							√					
2009	BRG	Breville Group Limited	Consumer Discretionary	√		√				√				√						√					
2010	BRG	Breville Group Limited	Consumer Discretionary	√		√								√						√					
2011	BRG	Breville Group Limited	Consumer Discretionary			√			√					√						√					
2011	SAI	SAI Global Limited	Industrials			√	√	√		√				√						√					
2012	SAI	SAI Global Limited	Industrials			√	√	√		√				√						√					
2010	AWE	AWE Limited	Energy									√			√							√			
2011	AWE	AWE Limited	Energy									√	√									√			
2012	AWE	AWE Limited	Energy	√	√			√			√			√							√				
2009	BLY	Boart Longyear Limited	Industrials			√							√								√				
2012	BLY	Boart Longyear Limited	Industrials	√		√	√	√		√	√		√							√					
2009	SBM	St Barbara Limited	Materials	√	√	√							√								√				
2010	SBM	St Barbara Limited	Materials	√	√			√					√								√				
2011	SBM	St Barbara Limited	Materials	√	√			√						√		√							√		
2012	SBM	St Barbara Limited	Materials	√	√			√										√		√					
2009	AAD	Ardent Leisure Group	Consumer Discretionary							√				√		√					√				
2011	CAB	Cabcharge Australia Limited	Industrials							√			√										√		
2012	CAB	Cabcharge Australia Limited	Industrials	√									√							√					
2009	SGT	Singapore Telecommunications Limited	Telecommunications Services	√	√					√			√							√					
2010	SGT	Singapore Telecommunications Limited	Telecommunications Services	√	√				√	√			√							√					
2011	SGT	Singapore Telecommunications Limited	Telecommunications Services	√	√				√	√			√							√					
2012	SGT	Singapore Telecommunications Limited	Telecommunications Services	√	√	√			√	√	√		√							√					
2009	DLS	Drillsearch Energy Limited	Energy		√					√				√											√
2009	GUD	GUD Holdings Limited	Consumer Discretionary									√		√		√				√					
2010	GUD	GUD Holdings Limited	Consumer Discretionary									√		√		√				√					
2011	GUD	GUD Holdings Limited	Consumer Discretionary		√	√	√	√						√		√				√					
2012	GUD	GUD Holdings Limited	Consumer Discretionary		√	√	√	√						√		√						√			

Year	ASX code	Company name	GICS industry sector	Appendix 2 (continued) Underlying earnings adjustments									Underlying earnings reporting location							Impact of underlying earnings on statutory earnings					
				Impairment or revaluation of assets	Gain or losses on asset dispositions or investments	Redundancies and restructuring costs	Merge or demerger and acquisition transaction costs	Tax or interest effects	Foreign exchange gain or loss	Other unspecified adjustments	Equity accounting	No adjustments	Highlights	Managing Director's report	Financial performance summary	Chairman's report	Notes to financial statements	CFO reports	Appendix 4E	Increase profit	Loss to profit	Decrease loss	Decrease profit	No changes	Increase loss
2009	EHL	Emeco Holdings Limited	Industrials	√		√		√								√				√					
2010	EHL	Emeco Holdings Limited	Industrials	√		√		√	√	√						√					√				
2011	EHL	Emeco Holdings Limited	Industrials									√				√				√					
2012	EHL	Emeco Holdings Limited	Industrials		√													√		√					
2012	BBG	Billabong International Limited	Consumer Discretionary	√		√	√	√		√					√						√				
2009	IMD	Imdex Limited	Materials					√	√				√										√		
2010	IMD	Imdex Limited	Materials	√				√	√				√								√				
2011	IMD	Imdex Limited	Materials	√	√			√					√											√	
2012	IMD	Imdex Limited	Materials	√	√			√					√							√					
2010	MBN	Mirabela Nickel Limited	Materials	√					√	√							√					√			
2011	MBN	Mirabela Nickel Limited	Materials	√		√	√		√	√							√								√
2012	MBN	Mirabela Nickel Limited	Materials	√				√	√	√				√						√					

Appendix 3: IC items definitions and examples

IC items	Explanations	Example
Internal capital		
Intellectual property	‘Intellectual property’ is a term that includes copyrights, patents, and trademarks (Li et al., 2008, p.156).	Patented Ultramatrix™ diamond coring bits are engineered to drill faster, last longer, and outperform existing bit technology in a wide range of drilling conditions and formations (Boart Longyear Limited 2010, p.5). Our patented easyBreathe technology underpinned growth in CpAps, ApAps and VpAp bi-levels this past year (ResMed Inc. 2009, p.5). DuluxGroup Limited is an Australian company that owns the Dulux® trademark (DuluxGroup Limited 2011, p.1).
Management processes	‘A process that consists of a series of actions (e.g., administrative or operational processes, corporate specialisation, etc.) that are chiefly concerned with relations between people that enable the firm to accomplish its objectives’ (Newman et al., 1972, p.11).	To assist our people to understand what is expected of them, we launched Leading at Rio Tinto in 2009. This requires seven leadership competencies to be demonstrated at each level of our organisation and includes promoting sustainable development. It is being incorporated in our recruitment and selection, performance management and development planning processes (Rio Tinto Limited 2009, p24).
Technological processes	‘Any technological activity that devotes to the organizational capital creation’ (Roos et al., 1997, p.49).	Work also continues to commercialise Origin’s SLIVER® photovoltaic technology and focus has shifted to transitioning the manufacturing process to a larger wafer platform, a change which offers potential to significantly enhance SLIVER’s economics (Origin Energy Limited 2009, p7).
Information systems	‘These includes enterprise-wide systems that designed to manage all major functions of the firm such as PeopleSoft, JD Edwards, SAP, and general purpose database products targeted towards specific users, for example, products that offered by Microsoft, Oracle, and many others’ (Dewett & Jones, 2001, pp.313-314).	One of the major milestones this year was the implementation of SAP, Atlas’ new accounting software and reporting system. A key contributor to the success of the implementation was the commitment, dedication and enthusiasm of all those involved. As a result, we have an ERP that will support our growth through 15Mtpa and beyond (Atlas Iron Limited 2012, p45).
Network systems	‘Are information technologies which include a wide range of communication devises and media. These communication devises and media link people and information systems including video conferencing, e-mail, voicemail, voice conferencing, car phones, personal digital assistants, fax machines, the internet, corporate intranets and groupware, and so on’ (Dewett & Jones, 2001, p.314).	During the year employee relations and communication has been a key focus area. Langer Heinrich implemented the INVOCOM (Employee Involvement through Communication for Commitment and Innovation) methodology which is a delivery vehicle for improved business performance through organisation, operational and service excellence. This ensures that employees are involved through effective communication and information sharing (Paladin Energy Limited 2012, p55).
Management philosophy	‘It is the way leaders in the firm think about its employees and the firm’ (Brooking, 1996, p.62). ‘The management philosophy is often communicated through mission statements which can have either a positive or negative influence on corporate culture and firm’s performance. It is depending on whether employees understand, remember and committed to it’ (Bart, 2001, p.322).	MDL’s philosophy is that all work-related injuries, diseases and property losses are preventable. The Company continues to develop and implement programmes that comply with international safety management standards using both system and a behavioural-based approach for safety and training (Mineral Deposits Limited 2012, p12). Our philosophy is that at all times we shall: Hold ourselves committed and accountable for ‘Delivering the Promise’. Have as our driving force the achievement of client satisfaction. Offer and provide genuine value for money. Acknowledge the loyalty of our clients, shareowners, and suppliers. Recognise and reward the creativity and dedication of our people. Provide a safe and fulfilling work environment (Fleetwood Corporation Limited 2009, p.2)

Appendix 3 (continued)

IC items (Internal capital continued)	Explanations	Example
Corporate culture	‘The set of beliefs, key values, and understandings shared by firm’s members’ (Samson & Daft, 2003, p.50).	AGL’s culture is built around five values – One Team, Delivery, Authentic, Safe & Sustainable and Vitality – which create the framework for delivering our brand promise of ‘Actions, not words’ (AGL Energy Limited 2010, p.9).
Financial relations	‘Favourable relationships that the firm has with banks, investors, and other financiers’ (Brooking, 1996, p.80).	The banking group includes all four major Australian banks as well as international banks, reaffirming the attractiveness of PNG as a place to invest. It also highlights the strength of our banking relationships, which have been built up over two decades. The five year term of the new credit facility provides the Company with funding flexibility well beyond the commencement of cash flows from the PNG LNG Project (Oil Search Limited 2012, p.14).
External capital		
Brands	‘Strongly influence the decision of customers to purchase services and products in preference to another firm. They can encompass service brand that represents its reliability and quality, or corporate brands that express the value in the market place in relation to the name of the firm’ (Brooking, 1996, pp.20-21).	As the leading accommodation booking service across Australasia, Wotif.com saw its brand awareness remain above 50% 17 in Australia (Wotif.com Holdings Limited 2009, p.11).
Customer satisfaction	‘It is the after-purchase judgment or evaluation of customers on a specific service or product. The benefits are related to firm’s profitability, customer loyalty, higher economic returns, and less reliance upon price based competition (Stank et al., 1997, p.3).	The development of our private label range and controlled brands continues, with all our ranges gaining strong customer acceptance. The growth in private label products exceeds our overall sales growth, which is a strong endorsement of their quality and value for money and also demonstrates good levels of repeat purchase (Woolworths Limited 2009, p.4).
Quality standards	‘Retaining of requisite standards in services and products’ (The Oxford Dictionary for International Business, 1998, p.703).	The Group strives to ensure that its services are of the highest standard. Towards this aim the Group has gained national accreditation AS/NZS ISO 9001:2000 Quality Management Systems (SMS Management and Technology Limited 2010, p.56).
Company names	‘The evaluation of a firm by its stakeholders in terms of their esteem, impacts, and knowledge’ (Deephouse, 2000, p.1093).	In June 2009, the Company’s name was changed from Paladio Group Limited to Decmil Group Limited. This change was made to allow the Company to leverage value from our main subsidiary, Decmil Australia, which has operated successfully for 30 years and has developed an outstanding reputation for safety, engineering construction, maintenance and industrial services (Decmil Group Limited 2009, p.13).
Favorable contracts	‘A contract achieved because of the firm’s unique market position (Brooking, 1996, pp.33-34).	WorleyParsons won a number of major new contracts during the year, including several important global services agreements, reflecting the deep and enduring relationships we have with clients (WorleyParsons Limited 2010, p.3).
Business collaborations	‘Collaboration established with other business partners’ (Brooking, 1996, p.31).	AGL has partnered with Coles’ loyalty program which rewards customers for everyday spending on electricity and gas. AGL is the only energy retailer able to offer customers this benefit (AGL Energy Limited 2012, p.25).
Licensing agreements	‘A wide range of agreements that give the right to a party to sell services, products, or technology to other parties based on the conditions set out in the agreement’ (Brooking, 1996, p.33). They include both licensing and cross-licensing agreements’ (Burton & Cross, 1997, p.138).	The two Australian underwriting licences were consolidated during the year, which will result in capital efficiencies in the order of \$25 million and operational efficiencies arising from the development of shared services (Wesfarmers Limited 2009, p.42).

Appendix 3 (continued)

IC items (External capital continued)	Explanations	Example
Franchising agreements	‘A contractual agreement that grants the license by franchiser to franchisee to carry out a franchise, franchiser to provide assistance to franchisee to carry out business in payment of a franchise fee. But, it is not a transaction within the consolidated group of firms’ (Brooking, 1996, p.32).	Oates has been established in the Australian cleaning products sector since early in the 20 th century. It holds a unique position in the market having a strong franchise with both professional cleaners and Australian householders; it accesses these users through a blend of industrial/commercial distributors and traditional retail outlets such as supermarkets, hardware stores and mass merchants (GUD Holdings Limited 2012, p.9).
Distribution channels	‘They are internal networks of distribution, such as distribution centres. They are what a firm forms and owns a very essential part of the supply chain’ (Li et al., 2008, p.158).	We have re-engineered our supply chain to accommodate the introduction of this second distribution centre via the use of overseas consolidation hubs (The Reject Shop Limited 2010, p.2).
Market share	‘The extent of market share held in relation to the total market share for a given service or product’ (Ailawadi et al., 1999, pp.20-22).	It was also a year that produced sustained sales performance throughout all of our commercial regions, terrific gains in capturing market share and success in managing our expenses (ResMed Inc. 2009, p.4).
Favourable relations with stakeholders	Includes customer relationships, public relationships and supplier relationships. ‘Customer relationship includes programmes and policies for building customer relationships. Public relationship is defined as the managing of outside communication of a firm to generate and sustain a positive image. Supplier relationship includes, e.g., reliance on key suppliers, payment terms, knowledge of suppliers, support of suppliers and bargaining power against suppliers’ (Li et al., 2008 p.158).	Woodside has extensive experience in developing, constructing and operating LNG projects, and has a strong relationship with government and customers in the region. Woodside is well placed to proceed with its portfolio of conventional LNG projects. In doing so, we continue to play a leading role in the industry, both in Australia and in the global LNG community (Woodside Petroleum Limited 2010, p.15).
Human capital		
Employee involvement in the community	‘It is an opportunity for face-to-face communicate with an often concealed but significant part of the firm’s stakeholders. It is a source for new ideas and the best chance for furthering the development and growth of a vital social institution’ (Byrne & Powell, 1976, p.6).	In addition to being first response or mine rescue members, many company staff are also dedicated volunteers outside of work with organisations such as the local fire brigade and the St John ambulance service. This preparedness to volunteer within a range and number of independent community organisations illustrates the unique individual commitment company employees have to the communities in which they live and work (OceanaGold Corporation 2009, p.41).
Employee thanked	‘Express gratitude to an employee for his or her contribution to the firm publicly’ (The Concise Oxford Dictionary, 1977, p.1198).	On behalf of my Board and fellow shareholders, I extend my thanks to John Borshoff and all Paladin staff for continuing to focus on the business of the Company and steer it through an extremely difficult period (Paladin Energy Limited 2012, p.7).
Employee featured	‘Give special prominence to, or make special attraction or display of firm’s employees’ (The Concise Oxford Dictionary, 1977, p.381).	Our exploration team, including Mr John Evans and Ms Margaret Hawke – the Project Geologist credited with the DeGrussa discovery – received well-deserved recognition for their achievements with the award of the highly prestigious AMEC “Prospector of the Year” Award for 2010 and “Excellence in Discovery” award at the National Excellence in Mining Conference (Sandfire Resources NL 2010, p.5).
Employee numbers	‘Firm’s employee count’ (The Concise Oxford Dictionary, 1977, p.748).	Ramsay Health Care now employs almost 25,000 staff across three continents. To ensure that we have a sustainable business we must be able to build a sustainable workforce. Through our People & Culture division, we are implementing a number of programs to assist with this aim (Ramsay Health Care Limited 2009, p.8).

Appendix 3 (continued)

IC items (Human capital continued)	Explanations	Example
Professional experience	‘The number of years that an executive worked in his or her profession’ (Sveiby, 1997, p.79).	Mr Poll is the founding Managing Director of Mirabela Nickel and led the discovery and development of the Santa Rita project. He is a geologist with more than 20 years’ experience in the development of mining projects internationally, including several years as a corporate development consultant in London (Mirabela Nickel Limited 2009, p.11).
Value-added by employee	‘The value created by the activities of the group and its subsidiaries by employees in their disciplines’ (Abeysekera, 2008, p.84).	Betsy brings with her a wealth of experience and knowledge of our industry, particularly within the oil and gas sector and her contributions to the deliberations of the board will continue to be invaluable (Imdex Limited 2010, p.13).
Know-how	‘Amount of knowledge that an employee has to possess about a particular topic. It could be a straightforward activity (e.g., raise an invoice) or a complex activity (e.g., design airplane wings). It would be tacit, for instance, taste tea by tea taster’ (Brooking, 1996, p.41).	Our technology teams have a great depth of knowledge in this area and a number of experienced senior staff have relocated to the US for the duration of the project. Running the same platforms for all our major business lines allows us to call on resources from all over the world. A significant amount of the expected synergies will be realised by our Technology Group (Computershare Limited 2012, p.12).
Education	<p>‘The exposure to new concepts, new knowledge, and new ideas in a structured way to increase knowledge or modify beliefs and attitudes’ (Mayo & Lank 1994, p.51).</p> <p>In this thesis, it also includes the ‘education acquired by an employee of the firm for a particular vocation that proves the knowledge, skill, and understanding the employee has to a job well’ (Brooking, 1996, pp.48-50).</p>	<p>An electronic learning management system is being progressively rolled out across the business, ensuring wide access to e-learning and online induction. ‘On boarding’ sessions have been held widely across the business, ensuring new co-workers understand the Amcor values and The Amcor Way (Amcor Limited 2010, p.16).</p> <p>Mr Karl M Simich Managing Director and Chief Executive Officer Qualifications B.Comm, FCA, F.Fin Experience and other directorships (Sandfire Resources NL 2011, p.2).</p>
Career development	‘Gradual uncovering of a course of progress through history or life of an employee with a firm’ (The Concise Oxford Dictionary 1977, pp.149, 281).	Our two-year Foundations for Graduates Program has been recognised as a leader in the field and has been designed specifically for graduates from tertiary institutions. Our aim is for our graduates to build a long and successful career with BHP Billiton. Each year, we recruit approximately 400 graduates in meaningful business roles, who each have the opportunity to work across teams, businesses and geographic regions (BHP Billiton Limited 2011, p.47).
Training programmers	‘Solutions to learning needs that takes the form of teaching or showing a way of doing things and are essentially skills-oriented’ (Mayo & Lank, 1994, p.51).	During the year, Decmil developed people strategies aimed at supporting the Company’s long-term growth, including Indigenous Traineeship, Plumbing Apprenticeships, and Certificate IV Training in Front Line Management, Training and Assessment and Environmental Management (Decmil Group Limited 2010, p.18).
Entrepreneurial spirit, innovativeness, proactive and reactive abilities and changeability	‘It includes creativity (e.g., tolerance of creative people, valuing creativity), empowerment (responsibility taking), knowledge sharing, and employee proactive and reactive ability’ (Li et al., 2008, p.156).	Innovation is at the heart of everything we do. It is reflected in our creation of state-of-the-art plasma collection and manufacturing facilities, our investment in improving current therapies, finding new indications for existing therapies, and innovating new therapeutic products for unmet needs (CSL Limited 2011, p.1).
Employment safety	‘Freedom from risks or danger when an employee is at work’ (The Concise Oxford Dictionary, 1977, p.994).	Computershare acts to meet this commitment by implementing work practices and procedures throughout the Group that comply with the relevant regulations governing the workplace. Employees are expected to take all practical measures to ensure a safe and healthy working environment in keeping with their defined responsibilities and applicable law (Computershare Limited 2009, p.23).

Appendix 3 (continued)		
IC items (Human capital continued)	Explanations	Example
Employee diversity	‘Diversity is the division of classes among a certain population. It refers to the mix of gender, ethnicity, sexual, and colour orientation. Relevant disclosures include employee diversity policy, the mix and breakdown of employee by religion, race, and culture’ (Li et al., 2008, p.155).	Mirabela is an equal opportunity employer and in 2010 the Company employed people with disabilities through a program of social inclusion. Gender diversity is also important and at the end of 2010, 12.7% of the Company’s employees were women (Mirabela Nickel Limited 2010, p.10).
Employee welfare	It refers to the employee (excluding executive staff) benefits compensation plans, share and share options schemes (Abeysekera, 2008, pp.87-88).	At the time of launch in May 2008, Woolworths was the largest private sector employer to introduce Paid Parental Leave. 1,080 Woolworth’s employees have accessed this benefit (Woolworths Limited 2009, p.6). Under the Oceana Gold Corporation Employee Share Acquisition Plan (the “Plan”), the Company offers all employees of the consolidated entity (other than directors of the Company) the opportunity to purchase shares in OceanaGold. Eligible employees are able to direct up to 10% of their gross salary to acquire shares, with the Company matching the employee contribution on a dollar for dollar basis (OceanaGold Corporation 2009, p70).

Sources: Adopted from Abeysekera (2008, p79-appendix 5.2): definitions and examples of intellectual capital items in the coding sheet for content analysis and Li et al. (2008, p155-appendix): definition and nature of information.