The Usefulness of Direct Cash Flow Statements under IFRS

by

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Submitted in accordance with the requirements for the degree of
Doctor of Philosophy

The University of Leeds
Leeds University Business School
Accounting and Finance Division
Centre for Advanced Studies in Finance

May 2013

Intellectual Property Statement

The candidate confirms that the work submitted is his own and that appropriate credit has been given were reference has been made to the work of others.

Dedication of this Thesis

To my beautiful wife Rachel, thank you for your love, support, encouragement, and prayers throughout my doctoral studies.

Acknowledgments

All the glory and praise for this thesis belongs to my Lord and saviour Jesus Christ for providing me with the focus, discipline, and support to complete this project.

It gives me great pleasure in acknowledging my primary supervisor, Dr Iain Clacher, for his guidance, support, encouragement, and many thought provoking discussions throughout my doctoral studies. Further, I am grateful to my second supervisor, Professor Allan Hodgson, for his valuable input and guidance in my thesis. In addition, I would like to thank Professor David Hillier for encouraging me to pursue this doctoral study, and for his support and guidance in the early stages of my thesis. I am obliged to many of my colleagues, both at the Centre for Advanced Studies in Finance, and within the Accounting and Finance division of Leeds University Business School for the numerous thought provoking conversations and encouragement over the past years. Special mention goes to Michelle Dickson for her tireless enthusiasm, support, and encouragement.

I am eternally grateful for my friends and family, especially my parents, Kevin and Jocelyn, and my father and mother in law, Mark and Helga, who have constantly prayed for and encouraged me over the years. My deepest gratitude, I owe to my beautiful wife Rachel, to whom I have dedicated this thesis, for her love, patience, encouragement, prayer, and support throughout my doctoral studies.

Finally, I am truly indebted and thankful to the Centre for Advanced Studies in Finance (CASIF) for their financial support, without which it would have been impossible to complete this thesis.

Abstract

The International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) have recently proposed to mandate the use of direct cash flow statements as part of their project to harmonise accounting standards. Despite the magnitude of the proposed change to cash flow reporting, to date, the IASB and FASB have provided no empirical evidence under International Financial Reporting Standards (IFRS) to support their assertion that direct cash flow statements provide financial statement users with useful information. Given the growing evidence that adopting IFRS significantly changes the quality of financial reporting information, the usefulness of direct cash flow statements may have also changed. This thesis, therefore, examines the usefulness of reporting direct cash flow statements under IFRS in Australia. Australia is specifically examined because it was one of the few countries where all firms were mandated to report direct cash flow statements, and which prohibited the early adoption of IFRS.

The findings of this research show that, relative to Australian Generally Accepted Accounting Principles (AGAAP), direct cash flow statements are more value relevant after the adoption of IFRS. Moreover, the results demonstrate that direct cash flow statements provide financial analysts with useful information for their cash flow forecasts, and this information is more useful under IFRS compared to AGAAP. Finally, this thesis provides evidence that, while financial analysts use information from direct cash flow statements when issuing stock recommendations, buy-and-hold investors are

better off identifying mispriced stocks by using analysts' cash flow forecasts in discounted cash flow valuation models.

In sum, these results provide strong support for the current IASB/FASB proposal to mandate the use of direct cash flow statements and are consistent with IFRS improving the information set of investors.

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List of Abbreviations

AARF	Australian Accounting Research Foundation
AASB	Australian Accounting Standards Board
AGAAP	Australian Generally Accepted Accounting Principles
AICPA	American Institute of Certified Public Accountants
APB	Accounting Principles Board
ASSC	Accounting Standards Steering Committee
ASX	Australian Stock Exchange
CFA	Chartered Financial Analysts
CSHPS	Cash payments to suppliers and employees
CSHRC	Cash receipts from customers
E.U.	European Union
ED	Exposure Draft
FASB	Financial Accounting Standards Board
FRED	Financial Reporting Exposure Draft
FRC	Financial Reporting Council
FRS	Financial Reporting Standards
GAAP	Generally Accepted Accounting Principles
I/B/E/S	Thomson Reuters Institutional Brokers' Estimate System
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IASC	International Accounting Standards Committee
ICAA	Institute of Chartered Accountants in Australia
ICAEW	Institute of Chartered Accountants in England and Wales
IFRS	International Financial Reporting Standards
OCF	Operating cash flows
SCFP	Statement of Changes in Financial Position
SEC	Securities Exchange Commission

SFAC	Statement of Financial Accounting Concepts
SFAS	Statement of Financial Accounting Standards
SSAF	Statement of Source and Application of Funds
U.K.	United Kingdom
U.S.	United States of America

1 Introduction

1.1 Introduction

The International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) have proposed, as part of their joint project to harmonise accounting standards, that all cash flow statements be prepared according to the direct method.[1] Historically, however, while actively promoting the direct method, the IASB and FASB have provided preparers with a choice of either the direct or the indirect method of cash flow statement presentation (FASB, 1987; IASB, 2010). Moreover, when presented with this choice, less than 4% of firms in the United States of America (U.S.), United Kingdom (U.K.), and Canada, adopted the direct method, resulting in the overwhelming majority of firms disclosing operating cash flows using the indirect approach (Wallace *et al.*, 1997; Krishnan and Largay III, 2000). Only three countries, Australia, New Zealand, and China, have ever mandated the disclosure of operating cash flows using the direct method (Wallace *et al.*, 1997; Clinch *et al.*, 2002). Unsurprisingly, therefore, the joint proposal by the IASB and FASB, to mandate the use of direct cash flow statements, has led to widespread debate and comment on the usefulness of this method.

A recent survey conducted by the Chartered Financial Analysts Institute (CFA Institute), has provided the IASB and FASB with some of their strongest evidence in support of their current proposal. From the 541 respondents, 63% of financial analysts

[1] See the Proposed Accounting Standards Update FASB Staff Draft of an Exposure Draft on Financial Statement Presentation published in July 2010 (paragraph 177).

agreed, or strongly agreed, that, when compared to the indirect method, a direct cash flow statement provided better information for forecasting cash flows and evaluating earnings quality (CFA Institute, 2009). In contrast, however, comment letters from three of the big four accounting firms, Deloitte, KMPG and EY, all stressed that further research was needed to investigate the costs and benefits of reporting direct cash flows, prior to mandating their adoption (FASB, 2009, comment letters 63, 114 and 99). PriceWaterhouseCoopers were the only big four firm to support mandating the direct method as proposed in the discussion paper (FASB, 2009, comment letter 172).

While the recent IASB and FASB proposal generated a large response via comment letters, the mandating of direct cash flow statements has been debated for more than three decades. Even before cash flow disclosures were standardised, academics had already begun to express a definitive preference for the direct approach (e.g., Paton, 1963; Heath, 1978; Lee, 1981; Thomas, 1982; Ketz and Largay III, 1987). Moreover, after cash flow disclosure requirements became common around the world, U.S. and Australian surveys, conducted on diverse groups of accounting and finance academics and professionals, continued to show support for the direct approach (e.g., Jones *et al.*, 1995; McEnroe, 1996; Smith and Freeman, 1996; Jones and Ratnatunga, 1997; Jones and Widjaja, 1998; Goyal, 2004). Further, a small, but growing body of empirical evidence has found that direct cash flow statements provide useful information to predict earnings and cash flows (e.g., Krishnan and Largay III, 2000; Arthur and Chuang, 2008; Cheng and Hollie, 2008; Orpurt and Zang, 2009; Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013), and explain stock returns (e.g., Livnat and Zarowin, 1990; Clinch *et al.*, 2002; Orpurt and Zang, 2009).

Although these findings provide support for the IASB and FASB proposal, all the recent Australian studies, however, specifically exclude observations after the mandatory adoption of International Financial Reporting Standards (IFRS) (e.g., Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). Arthur *et al.* (2010) cite the significant changes to the financial data, caused by adopting IFRS, as reason to exclude all observations under the new standards. There is growing evidence that, in many cases, adopting IFRS does improve the comparability and quality of the financial information reported by firms (e.g., Daske *et al.*, 2008; Aharony *et al.*, 2010; Bissessur and Hodgson, 2011; Cotter *et al.*, 2012; Horton *et al.*, 2012).

Prior to Australia's adoption of IFRS, European markets were shown to have reacted positively to a series of announcements leading up to the European Union's (E.U.) adoption of IFRS (Armstrong *et al.*, 2010). Investors clearly believed that the mandatory adoption of IFRS by the E.U. would improve the overall quality of financial reporting information. There is evidence to suggest that this belief of improved accounting information under IFRS was correct. Using a global sample of IFRS adopters, Daske *et al.* (2008) found a general reduction in cost of capital and improved capital market liquidity after the mandatory adoption of IFRS, particularly when those standards were actively enforced. Although Ball (2006) raised concerns that, under IFRS, fair value accounting would increase earnings volatility, overall, annual reports prepared under IFRS seem to have provided users with a richer information set than was available under local GAAP.

The view that IFRS provides users with a richer information set is borne out by a number of recent studies both globally and in Australia, and show a significant increase in analysts' earnings forecast accuracy under IFRS (Bissessur and Hodgson, 2011;

Cotter *et al.*, 2012; Horton *et al.*, 2012). These findings help support the idea that accounts prepared under IFRS conventions present users with useful information to help evaluate an entity's future cash generating potential, a key goal of the IASB (IASB, 1989, paragraphs 15-18). Given the evidence that IFRS has improved the quality of financial reporting information, it is important to examine whether the importance of direct cash flow information changes in an IFRS environment, as it is an established source of information, which could be complemented by the improved information set provided by IFRS.

1.2 Contributions of the Thesis

To date, no research has examined whether direct cash flow statements provide useful information within an IFRS reporting framework. While the IASB and FASB are yet to make a decision on the mandatory use of direct cash flow statements, if it is decided that only direct cash flow statements are to be allowed, such a decision would affect cash flow reporting across most of the world. Given the significant changes made to financial reporting with the introduction of IFRS, before a decision is made to mandate direct cash flow statements, the IASB and FASB should understand whether direct cash flow statements are useful in an IFRS reporting framework. The objective of this thesis is, therefore, to understand whether or not direct cash flow statements are useful sources of information in an IFRS setting. In doing so, this thesis provides the first evidence as to whether the proposed mandating of direct cash flow statements would further improve the informational environment under IFRS.

Australia prohibited the early adoption of IFRS, and mandated the use of direct cash flow statements before and after the introduction of IFRS. Moreover, Australia is a high

enforcement regime and has both liquid and developed markets as well as sophisticated users of financial accounts. Australia is, therefore, an ideal setting to investigate how IFRS adoption may have changed the usefulness of information from direct cash flow statements. Accordingly, by using Australian data, Chapters 5 to 7 of this thesis, provide unique evidence regarding the usefulness of direct cash flow statements under IFRS.

1.2.1 The Value Relevance of Direct Cash Flows under IFRS

Chapter 5 examines whether there has been a change in the value relevance of operating cash flows and direct cash flow components since the adoption of International Financial Reporting Standards in Australia.

Using an Ohlson (1995) model, the findings show that direct cash flows are value relevant across all industries. Moreover, there is a significant increase in the value relevance of operating cash flows and direct cash flow components under IFRS for industrial firms. Overall, the findings support the proposition that direct cash flow statements are useful to investors, providing a reliable source of price relevant information under IFRS.

1.2.2 Direct Cash Flow Statements and Analyst Cash Flow Forecast Accuracy under IFRS

Chapter 6 examines whether information from direct cash flow statements are used by financial analysts in predicting future cash flows. In addition, this chapter tests whether there has been a change in the usefulness of cash flow statements for predicting future cash flows after the move from Australian GAAP to IFRS. Motivating this chapter is

the CFA survey feedback that analysts' believe direct cash flow statements provide useful information for forecasting future cash flows (CFA Institute, 2009).

The findings show that (i) direct cash flow components are a strong predictor of analysts' cash flow forecasts and (ii) this relationship has strengthened since the adoption of IFRS. Moreover, the results show a decrease in analysts' cash flow forecast errors in the post-adoption period, which is partly due to analysts' increased use of direct cash flow components under IFRS.

1.2.3 Are Analysts' Cash Flow Forecasts and Direct Cash Flow Statements Essential Inputs to Generate Stock Recommendations?

Chapter 7 is the final empirical chapter, which examines whether financial analysts' use their cash flow forecasts when issuing stock recommendations in Australia. In addition, the chapter tests whether information from direct cash flow statements are used by financial analysts when identifying mispriced securities.

Prior studies demonstrate that analysts' stock recommendations relate positively to valuation heuristics based on their earnings forecasts, but negatively to future excess stock returns and residual income valuations. While these findings validate the use of analysts' earnings forecasts as valuation inputs to identify mispriced securities, the extant literature has left unanswered whether analysts' cash flow forecasts are used in a similar manner. A growing body of research has demonstrated the value relevance of analysts' cash flow forecasts, and recent large-scale survey results show most analysts' believe direct cash flow statements provide useful information for forecasting future cash flows.

The findings in this chapter show that analysts do use their cash flow forecasts and historical direct cash flow information when setting stock recommendations. However, analyst stock recommendations relate negatively to future excess stock returns and discounted cash flow models. Overall, the results are consistent with the earnings based studies, and demonstrate that buy-and-hold investors are best off using analysts' forecasts in multi-period valuation models to identify mispriced securities. Moreover, comparing the profitability of multi-period earnings vs. multi-period cash flow valuation techniques, buy-and-hold investors are significantly better off using analyst cash flow forecasts in discounted cash flow models for identifying mispriced securities.

1.3 Structure of the Thesis

This thesis is organised as follows:

- Chapter 2 provides a historical overview of the development of cash flow reporting in the U.S., U.K., Australia, and by the IASB. Moreover, this chapter shows, when developing cash flow reporting standards over the past three decades, the centrality of the debate concerning the disclosure of operating cash flows for all accounting regulators regardless of jurisdiction. This chapter ends with an overview of the recent proposal by the IASB and FASB, as presented in their discussion paper, recommending the mandatory use of direct cash flow statements.
- Chapter 3 reviews the extant literature examining the usefulness of direct cash flow statements. Empirical results suggest that information from direct cash flow statements do provide incremental explanatory power and accuracy to cash flow prediction models in addition to explaining capital market returns. However, to date, all empirical studies have focussed on investigating the usefulness of direct cash

flow statements under domestic accounting standards in either the U.S. or Australia. No research has investigated the usefulness of direct cash flows when reported under IFRS. Chapter 3, therefore, also provides an overview of the key studies examining the impact of adopting IFRS around the world, showing that most studies have found a significant improvement in financial accounting quality under IFRS.

- Chapter 4 presents the sample selection criteria and high-level descriptive statistics of the sample used in this study. In doing so, this chapter illustrates the representative nature of the sample, and the relationship between key accounting variables over the period. More detailed descriptive statistics and sampling and selection criteria are presented and discussed in Chapters 5 to 7.
- Chapter 5 is the first empirical chapter, which examines the value relevance of direct cash flow statements under IFRS, and the change in value relevance of direct cash flow statements since Australia adopted IFRS.
- Chapter 6 empirically examines whether financial analysts use information from direct cash flow statements when forecasting cash flows under Australian GAAP and IFRS. Further, this chapter examines whether analysts find information from direct cash flow statements more useful for forecasting cash flows under IFRS, when compared to Australian GAAP.
- Chapter 7 is the final empirical chapter, which examines whether financial analysts use their cash flow forecasts and information from direct cash flow statements as inputs in the process of arriving at their final output, the stock recommendation. Further, this chapter examines whether buy-and-hold investors are better able to identify mispriced securities by following the analysts' recommendation or by using analysts' cash flow forecasts in discounted cash flow valuation models.

- Chapter 8 provides a summary and conclusion of the thesis, an overview of the policy implications, and direction for further research.

2
The Historical Development of Cash Flow Reporting

2.1 Introduction

2.1.1 Recording Cash Flows: The Oldest Form of Accounting

Cash flow accounting is one of the oldest forms of record keeping dating back to the middle ages, during which time, all recorded business deals related to actual cash receipts or payments with no regard given to the specific timing of these transactions (Edwards, 1996, page 32). Subsequently, double entry bookkeeping and accrual accounting developed, precipitating a radical change to accounting, to match the costs of resources used with the associated revenues generated by those same resources. Matching cost and revenue streams allowed firms to calculate a profit or loss for the reporting period, which was useful in ensuring the accuracy and completeness of the accounting records presented to the owner (Edwards, 1996, page 33) .

2.1.2 From The Balance Sheet to the Income Statement

Soon after the creation of accrual accounting, the balance sheet grew in prominence as a focal point within financial reporting, and remained so until the late 17th century. Edwards (1996, page 34) report that business owners were primarily concerned with the financial position of the firm and, therefore, placed far less importance on the profit and loss account, which was mainly used to balance the financial records. Moreover, the balance sheet provided owners with useful information to monitor management in the

fulfilment of their role as stewards of the business. However, by the early 18th century and rise of the industrial revolution, the focus had shifted from the balance sheet and onto the income statement (Brown, 1971, page 9).

Between 1920 and 1940, the income statement became increasingly more important to investors (Brown, 1971, page 57). The shift away from the balance sheet as the principal vehicle for reporting the financial position of a firm was a direct consequence of the rise of the modern corporation which had led to growing separation between managers and their owners (Brown, 1971, page 48). Moreover, the increased use of the stock market to raise external capital further shifted the focus of financial reporting off debt holders and towards equity holders. Firms, therefore, began to enhance their disclosures surrounding profitability, rather than focussing entirely on their ability to repay debts as they fell due. As equity holders started using this information, the income statement grew further in importance as a means of evaluating both managements' performance and the future prospects of dividend and capital growth.

Although the need for information by equity holders was a major catalyst surrounding the emergence of the income statement, two other important factors reinforced this shift away from the balance sheet. First, external pressure for accurate profit/loss figures came from governments demanding accurate information for the collection of corporate income taxation. Second, rapidly rising prices in the early 20th century resulted in the need for information to evaluate the effect of inflation on the profitability and going concern of the businesses (Brown, 1971, page 57). Income statements, accordingly, provided financial statement users with a good basis to measure the effects of changing prices on the business operations.

Investors, creditors, and analysts demands for more detailed financial information soon surpassed the level of information reported by the income statement and balance sheet alone. Firms, therefore, started voluntarily supplementing the income statement and balance sheet with a funds flow statement.[2] However, the 1987 global stock market crash, problems with the funds flow statement, and series of corporate failures, resulted in global reforms to cash flow reporting from the late 1980's to early 1990's (Thomas, 1982). Standard setters responded to the growing demand for cash flow information and mandated the disclosure of a "cash" flow statement in the financial accounts. A key difference between the "funds" and "cash" flow statements was that while, previously, the "funds" flow statement was a reconciliation of the changes in working capital, the "cash" flow statement now focussed on reconciling changes in cash and cash equivalents.

2.2 The American Influence on Cash Flow Reporting

Initial widespread global adoption and disclosure regulation of the funds flow statement, and subsequent cash flow statement, was pioneered and heavily influenced by standard setting bodies within the United States of America (U.S.), with other countries following their lead (Donleavy, 1994).[3] With this in mind, the historical development of cash flow reporting elsewhere in the world, such as in the United Kingdom (U.K.), Australia and by the International Accounting Standards Board (IASB), makes sense only when placed within the context of the development of cash flow reporting in the U.S.

[2] See Table 2-1 for an Illustrative example of a funds flow statement.
[3] See Table 2-2 for an overview of the historical development of cash flow reporting in the U.S.

Table 2-1 Illustrative example of a funds flow statement

ABC Holdings Limited	
Funds-Flow Analysis for the year ended 31.12.2012	**£ '000s**
Collections of long-term receivables originating in earlier periods	125,000
Receipts and current receivables originating from current sales	1,049,500
Cash or equivalent from equipment disposals	8,000
Funds from past and current revenues and disposals	1,182,500
Expenditures or equivalent included in expenses, taxes, and interest	(525,500)
Funds balance before dividends	657,000
Dividends	(65,000)
Funds balance after dividends	592,000
Utilisation of funds balance:	
Inventory replacement	(480,000)
Equipment expenditures	(47,000)
Leaseholds acquired	(50,000)
Increase in excess of liquid assets over current liabilities	15,000
Funds balance at the start of the year	50,000
Funds balance at the end of the year	**65,000**

Funds balance comprises of:	**Balance at the start of the year**	**Balance at the end of the year**
Cash and short-term receivables	275,000	295,000
Current liabilities	225,000	230,000
Excess of cash and receivables	**50,000**	**65,000**

The above example of a Funds Flow Statement has been adapted from Paton (1963), page 249.

2.2.1 The Development of the Funds Flow Statement in America

Prior to the 1960's, most U.S. firms only reported an income statement and balance sheet as part of their annual accounts, with little or no information about the flow of resources over the period. By the early 1960's, however, a number of firms had adapted their financial reports to address this problem, evidenced by the growing use of the funds flow statement (Davies *et al.*, 1994). In fact, a random sample of Fortune 500 firms revealed that 39% had reported some form of funds flow statement as part of their annual accounts by 1962 (Donleavy, 1994, page 65). Comparability between different

firms funds flow statements quickly became a problem, however, due to a lack of adequate regulation. Accordingly, in 1961 the American Institute of Certified Public Accountants (AICPA) intervened by initiating the launch of Accounting Research Study No. 2 - *"Cash Flow" Analysis and The Funds Statement*, in an effort to standardise their disclosure (Savoie, 1965).

Table 2-2 Summary of the development of cash flow reporting in the U.S.

Key Date	**Key Development**
1860's	A small number of companies were seen to be using some form of funds flow statement
1950's	Widespread use of various forms of funds flow statements in the U.S.
1963	Issue of *Opinion No. 3 "The statement of Source and Application of Funds"* by the APB whereby Funds flow statement disclosure is encouraged but not mandatory
1970	Issue of Securities Exchange Commission (SEC) Release No. 117, which required the mandatory disclosure of a Funds flow statement for all companies filing accounts.
1971	Issue of *Opinion No. 19 "Reporting Changes in Financial Position"* by the APB requiring the disclosure of a Funds flow statement for all companies disclosing both an Income Statement and Balance Sheet as part of their annual accounts
1984	Issue of *Statement of Financial Accounting Concepts (SFAC) No. 5 "Recognition and Measurement in Financial Statements of Business Enterprises"* which saw the inclusion of funds flow statements as an integral part of a company's annual accounts.
1987	Issue of *Statement of Financial Accounting Standards (SFAS) No. 95 "Statement of Cash Flows"* which superseded APB No. 19, effective for all companies with financial years ending on or after July 1988

Responding to the findings of AICPA in October 1963 the Accounting Principles Board (APB) issued their Opinion No. 3 *"The Statement of Source and Application of Funds"*, which recommended, but did not mandate, the use of a "*Statement of Source and Application of Funds*" (SSAF) as a supplementary part of a company's annual accounts (CFA Institute, 1964, page 14). Industry support for this standard was overwhelming, and by 1967 a random sample of Fortune 500 firms revealed 89% had voluntarily disclosed the SSAF (Donleavy, 1994, page 65) .

Growing acceptance and use of the SSAF, accordingly, motivated the U.S. Securities and Exchange Commission (SEC) to issue their Release No. 117 in 1970, mandating the inclusion of a SSAF for all companies required to file their annual accounts with them (Savoie, 1965). By March 1971, not long after the SEC release, the APB superseded their prior Opinion No. 3, and issued Opinion No. 19 – "*Reporting Changes in Financial Position"* mandating the disclosure of a renamed "*Statement of Changes in Financial Position*" (SCFP) for all companies disclosing an income statement and balance sheet as a part of their annual accounts.

Subsequently, however, a number of papers were highly critical of the mandated SCFP as required by APB No. 19. Comments stated that the funds flow statement was confusing, misleading and ambiguous (Holmes, 1976; Taylor, 1979; Han, 1981; Smith, 1985; cited in Donleavy, 1994, page 68). Moreover, the loose definition of "funds" by the standard, which could be either "working capital" or "cash", was heavily criticised (Spiller and Virgil, 1974; Swanson and Vangermeersch, 1981; Ketz and Kochanek, 1982; Clark, 1983; Bryant, 1984; cited in Donleavy, 1994, page 68).

An empirical study by Spiller and Virgil (1974) continued to find significant differences between the funds flow statements disclosed by their sample of 143 public

firms, mainly due to different interpretations of the requirements of APB No. 19. They concluded that the standard had significant weaknesses in clearly defining one overall purpose of the SCFP. The current purpose of APB No. 19 appeared mixed between reporting flows into and out of a "body of funds" and accounting for the movements in balance sheet accounts. Even the Financial Accounting Standards Board (FASB) acknowledged:

> *"The lack of clear objectives for the statement of changes in financial position…"*
>
> *(FASB, 1987, paragraph 2)*

A subsequent critical review of disclosed funds flow statements performed by Drtina and Largay III (1985) compared the SCFP's from three listed entities. Their findings further highlighted the significant caveats contained within APB No. 19 whilst at the same time motivating the use of the direct method to report operating cash flows. This method reported gross operating cash flows directly on the face of the cash flow statement, as opposed to the indirect approach, which calculated the net operating cash flow by adjusting the net profit for accruals and non-cash amounts. Drtina and Largay III (1985) demonstrated the direct method more accurately and clearly portrayed the firms operating cash flows, especially since APB No. 19 inadequately defined operations.

While most papers were highly critical of APB No. 19, some did comment positively that the SCFP provided useful information which could improve the accuracy of forecasting cash flows and business failures (Siegel and Simon, 1981; Byrd and Byrd, 1986; Coker, 1986; Gentry *et al.*, 1987; cited in Donleavy, 1994, page 67).

2.2.2 The Evolution to the Cash Flow Statement in America

Responding to the growing criticisms levelled against APB No. 19, the FASB issued Statement of Financial Accounting Standards (SFAS) No. 95 *"Statement of Cash Flows"* which superseded APB No. 19, effective for all companies with financial years ending after July 1988 (FASB, 1987). The U.S. was one of the first countries to introduce a standard on cash flow disclosure.[4] Although the standard was issued primarily to eliminate the ambiguities of APB No. 19, it also developed as a result of FASB completing their conceptual framework and issuing the Statement of Financial Accounting Concepts (SFAC) No. 5 *"Recognition and Measurement in Financial Statements of Business Enterprises"*. SFAC No. 5 saw the inclusion of cash flow statements as an integral part of a company's annual accounts (Donleavy, 1994).

SFAS No. 95 clarified the definition of cash flows and purpose of the standard, requiring the classification of cash receipts and payments according to whether they arose from operating, investing or financing activities. The purpose of the standard was to provide relevant information about cash receipts and payments during the period in order for users to be able to:

> *"…assess the enterprises ability to generate positive future net cash flows...meet its obligations...assess the reasons for the differences between net income and associated cash receipts and payments...and assess the effects on an enterprise's*

[4] Although the U.S. was the first country to pioneer the development of the funds flow statement, they were actually the second country to replace their funds flow statement with a cash flow statement, preceded by Canada. In 1985 the Canadian Institute of Chartered Accountants (CICA) issued The Standard no. 1540 *"Statement of Changes in Financial position"* requiring the disclosure of a cash flow statement as part of a complete set of accounts for all businesses (Donleavy, 1992). Comparisons of these and other major cash flow reporting standards issued around the world has been summarised by Wallace *et al.* (1997).

> *financial position of both its cash and non-cash investing and financing transactions during the period."*
>
> *(FASB, 1987, paragraphs 4-6)*

This definition made it clear that FASB designed SFAS No. 95 with the main objective of providing users with information to better estimate future cash flows in order to determine the firm's ability to meet their future obligations. FASB further anticipated the informational benefits from reporting actual cash receipts and payments, in addition to a reconciliation of operating profits to cash flows, which could be useful in assessing the persistence of historical earnings. This information could help measure the impact of accrual accounting on the underlying profitability and future cash generating capacity of the enterprise.

Standard setters, therefore, explicitly declared their preference for the direct disclosure of cash flows arising from operating activities through the presentation of gross cash receipts and payments on the face of the cash flow statement. This approach is commonly known as the direct method of cash flow presentation.[5] One of the most fiercely debated topics in cash flow reporting, has arisen from the standard setters' preference for this approach over the indirect method. This essentially forms the core of the thesis, which aims to examine the usefulness of direct cash flow statements further.

[5] See Table 2-3 for an example of operating cash flows reported using both the direct method and indirect method of presentation.

Table 2-3 Illustrative examples of the indirect and direct method of disclosure

XYZ Holdings Limited

Cash flows from operating activities using the Indirect Method	**£ '000s**
Profit for the year	27,049
Income tax expense recognised in profit or loss	14,724
Share of profits of associates	(1,186)
Finance costs recognised in profit or loss	4,418
Investment revenue recognised in profit or loss	(3,608)
Gain on disposal of property, plant and equipment	(303)
Net cash inflow on disposal of subsidiary	13,664
	54,758
Movements in working capital	
Increase in trade and other receivables	(3,046)
Increase in inventories	(5,900)
Decrease in trade and other payables	(446)
Cash generated from operations	**45,366**
Interest paid	(4,493)
Income taxes paid	(13,848)
Net cash generated by operating activities	**27,025**

Cash flows from operating activities using the Direct Method	**£ '000s**
Receipts from customers	211,032
Payments to suppliers and employees	(165,666)
Cash generated from operations	**45,366**
Interest paid	(4,493)
Income taxes paid	(13,848)
Net cash generated by operating activities	**27,025**

The above example has been adapted from the Deloitte Model Financial Statements 2009 (Deloitte, 2009)

Other notable issues arising from SFAS No. 95 were the classification of dividends paid as financing activities whilst dividends received, interest received and interest paid were all classified as operating activities. Disclosing “cash flow per share” was prohibited in the conclusion of the standard, based on the boards concern that this could

mislead shareholders in believing it to be an alternative measure of performance to earnings per share (FASB, 1987, paragraphs 122-125).

Both The Financial Reporting Council (FRC) in the U.K. and the Australian Accounting Standards Board (AASB) were quick to follow the U.S. by issuing their respective standards, Financial Reporting Standard (FRS) 1 in September 1991, and AASB 1026 in December 1991. Around the same time the International Accounting Standards Committee (IASC) issued IAS 7 (revised 1992) "Cash Flow Statements" which replaced IAS 7 (1977) "Statement of Changes in Financial Position" thereby aligning the IASC more closely with FASB. The next three sections of this chapter will therefore examine and discuss the development of cash flow reporting in the U.K., Australia and by the IASB.

2.3 The Development of Cash flow reporting in the U.K.

2.3.1 The Development of Funds Flow Reporting in the U.K.

The historical development of cash flow reporting in the U.K. followed a very similar pattern to the U.S., with one noteworthy exception, U.K. firms were a lot slower in their mass acceptance and use of the funds flow statement.[6] Davies *et al.* (1994), providing an overview of the history of cash flow reporting in the U.K. up to the issuance of FRS 1, comment that prior to the 1970's there was little evidence of the same widespread use of the funds flow statement in the U.K. compared to what had been observed in America. However, much like in America, Rosen and Don (1969) noted that a form of funds flow statement had been used by some U.K. companies from as early as 1862.

[6]See Table 2-4 for an overview of the historical development of cash flow reporting in the U.K.

Table 2-4 Summary of the development of cash flow reporting in the U.K.

Key Date	Key Development
1974, April	Issue of *Exposure Draft (ED) 13: Statements of Source and Application of Funds* for comment
1975, July	Issue of *Statement of Accounting Practice (SSAP) 10: Statements of Source and Application of Funds* effective for fiscal years ending on or after 1 January 1976
1978, June	Part 4 added to SSAP 10 highlighting the alignment of the standard with *IAS 7: Statement of Changes in Financial Position*
1990, July	Issue of *ED 54: Cash flow statements* issued by the ASC for comment
1991, September	Issue of *Financial Reporting Standard (FRS) 1: Cash Flow Statements* by the Accounting Standards Board (ASB) to supersede SSAP 10 effective for fiscal years ending on or after 23 March 1992
1994, March	Issue of Financial Reporting Exposure Draft (FRED) 10: Revision of FRS 1 Cash Flow Statements for comment
1996, October	Issue of *FRS 1 (Revised 1996): Cash Flow Statements* by the ASB effective for fiscal years ending on or after 23 March 1997
2002, July	Issue of *Regulation (EC) No 1606/2002 of the European Parliament and of the Council* requires that the consolidated accounts of all listed European firms be prepared in accordance with International Financial Reporting Standards (IFRS)
2005, January	The application of IFRS including *IAS 7* becomes mandatory for all consolidated accounts of listed U.K. companies with annual reporting periods on or after this date

Based on FRS 1 (1991), Davies *et al.* (1994), FRS 1 (1996), Cox and Pendersen (2002), and Rutherford (2007).

By the 1970's, however, the Institute of Chartered Accountants in England and Wales (ICAEW) surveys of published accounts show rapid acceptance and common use of the funds flow statement within U.K. companies. While only 13% of firms reported a funds flow statement in 1970, this had risen to 100% by 1979 (Rutherford, 2007, page

82). Driving the quick adoption of funds flow statements was the initial issue of Exposure Draft (ED) 13 *"Statements of Source and Application of Funds"* in April 1974 from the recently formed Accounting Standards Steering Committee (ASSC).[7] ED 13 offered U.K. companies guidance on how to disclose a funds flow statement, and received widespread support that resulted in the issuance of SSAP 10 *"Statements of Source and Application of Funds"* in July 1975, fifteen months later. SSAP 10 targeted all enterprises with turnover or gross income greater than £25,000 per annum and argued that companies should adopt it if their accounts were to provide a *"true and fair view of financial position and profit or loss"* (ICAEW, 1985, page 219; paragraph 9). Firms were, therefore, pressurised by the ASSC to adopt SSAP 10, since according to the Companies Act (1967), failing to adopt SSAP 10 could lead to a qualified audit opinion.[8]

It was not long, however, before SSAP 10 received similar criticisms to those levelled against the U.S. equivalent, APB No. 19. One of the standard's main weaknesses was its vague objective, which portrayed the funds flow statement as a reconciliation of the opening balance sheet and current year profits with the closing balance sheet (Davies *et al.*, 1994). From the standard's objective it was, therefore, unclear whether the ASSC anticipated SSAP 10 would provide any new information to financial statement users. In fact, the objective of SSAP 10 appeared to view the funds flow statement as a mere "reclassification" of information that was already available to the reader when it stated that:

[7] The ASSC was formed by the ICAEW in 1970 with the purpose of carrying out the objectives of the ICAEW Council's statement of intent as agreed on December 12, 1969 to publish authoritative standards, increase the uniformity of accounting practice and encourage the on-going improvement of accounting standards (Rutherford, 2007, pages 26 and 31).

[8] The Companies Act (1967) clearly stated in section 14 that the auditor had to express an opinion as to whether the accounts provided a "true and fair view" of the financial position and performance of the entity.

> *"The funds statement is in no way a replacement for the profit and loss account and Balance Sheet although the information which it contains is a selection, reclassification and summarisation of information contained in those two statements. The objective of such a statement is to show the manner in which the operations of a company have been financed and in which its financial resources have been used…"*
>
> *(ICAEW, 1985, pg 218; paragraph 2)*

Further to these criticisms, were those that noted the inadequate definition of "funds", and the lack of guidance to encourage a consistent format of disclosure. The missing emphasis on "cash" flow in the funds flow statement was demonstrated within the appendix of general guidance to SSAP 10. For example, an entity issuing shares in return for an interest in a subsidiary company was recommended to disclose the transaction as both a "source" and "application" of funds, even though there was no impact on the firm's cash resources (ICAEW, 1985, pg 224; example 3).

2.3.2 The Issue of FRS 1 Cash Flow Statements

The lack of clear guidance provided by SSAP 10, coupled with the vague objectives and poor definition of "funds", pressurised the ASC for further reforms, resulting in the issue of *Exposure Draft (ED) 54: Cash Flow Statements* in July 1990. After receiving the comments on ED 54, the newly formed Accounting Standards Board (ASB) issued *Financial Reporting Standard (FRS) 1 Cash Flow Statements* fourteen months later. FRS 1 was clearly influenced by SFAS No. 95, issued in the U.S. around four years prior to its development. From the outset of FRS 1, the ASB made it clear that they had

considered the criticisms levelled against SSAP 10 and there was, accordingly, far less ambiguity regarding the objective of FRS 1, which clearly stated:

> *"The objective of the FRS is to require reporting entities…to report on a standard basis their cash generation and cash absorption for a period."*
>
> *(FRS 1, 1991, paragraph 1)*

From this definition, it was apparent the ASB had addressed two notable caveats of SSAP 10. FRS 1 required reporting on a "standard basis", thereby, eliminating alternative methods of disclosure, which had previously reduced comparability between firms. Moreover, the standard had moved away from reporting "funds" flow and focussed on disclosing the "cash" generated and absorbed during the period.

2.3.2.1 Improved Comparability and Change in Scope

The ASB achieved their objective by mandating a very rigid format for the cash flow statement under five major categories: "operating activities", "returns on investments and servicing of finance", "taxation", "investing activities" and "financing". Strictly categorising cash flows helped to increase the comparability between enterprises, thereby, resolving one of the major problems of SSAP 10. Further, the scope of the standard changed to exempt a far wider range of entities when compared to the simple £25,000 threshold used by SSAP 10. Changing the scope was largely driven by the argument that the cost of disclosing a cash flow statement would likely outweigh the benefits of reporting cash flow information for certain entities (FRS 1, 1991, paragraph 58).

A clear definition of "cash flow" provided by the ASB, further helped to increase the comparability of cash flow statements between companies. The standard defined "Cash flow" as an increase or decrease in "cash" or "cash equivalents", with no reference made to "funds" or working capital. Moreover, FRS 1 defined "Cash" as cash in hand and demand deposits while it defined "cash equivalents", much like SFAS No. 95, as being "short-term highly liquid investments" convertible into cash without notice and maturing within three months from the date of issuance, such as treasury bills. These changes were a vast improvement on the loose definition of "net liquid funds" provided by SSAP 10 as they helped increase the comparability between cash flow statements.

A further change resulting from the move to FRS 1 concerned the disclosure of operating cash flows. FRS 1 allowed operating cash flows to be reported on a net or gross basis on the face of the cash flow statement along with a reconciliation of operating profit to cash flow to be shown as part of the notes to the accounts (FRS 1, 1991, paragraph 16-17). Reading the explanation to the standard makes it is clear that the ASB were not lobbying their constituents to use the direct method as hard as FASB when they presented SFAS No. 95. In fact, the ASB put forward a very balanced debate on the benefits of disclosing operating cash flows using either the direct or indirect method (FRS 1, 1991, paragraphs 69-72). Consequently, FRS 1 noted that the direct method may provide useful information for assessing future cash flows but the indirect method may be useful to assess the quality and persistence of earnings.[9] Even though four out of six of the illustrative examples in the standard's appendix made use of the direct method, the ASB only encouraged the use of this approach when the enterprise

[9] The ASB note that the indirect method helps investors assess the quality and persistence of historical earnings by providing a detailed breakdown of past accrual adjustments that would be useful when forecasting future earnings or cash flows.

believed the benefits of adopting the direct method would outweigh the associated costs of obtaining the required information. In either case, the ASB were clear that all firms adopting FRS 1 should disclose a reconciliation of operating profit to cash flow as part of the notes to the cash flow statement.

2.3.2.2 The Revision of FRS 1 and Subsequent Issue of FRS 1 (Revised)

With the widespread adoption of FRS 1, the ASB wanted feedback on the standard and, therefore, issued Financial Reporting Exposure Draft (FRED) 10: *Revision of FRS 1 Cash Flow Statements* for comment (FRS 1, 1996). Based on the responses received to FRED 10, the ASB issued a revised standard on cash flow reporting; *FRS 1 (revised 1996): Cash Flow Statements*. The first key change to the old standard concerned the definition of "cash flow" since business managers had criticised including "cash equivalents" as part of "cash flow". They did not consider investments with a maturity of less than three months at the date of inception to be "equivalent" to cash in the running of the enterprise. In view of these comments the ASB revised the definition of "cash flow" to include only "cash", meanwhile "cash equivalents", as defined by the original FRS 1, were reported under a newly created category, "management of liquid resources" (FRS 1, 1996, appendix 3.6-3.8).

In addition to this new category, the revised FRS 1 added two more levels of cash flow classification, increasing the total number of standard headings from five to eight. FRS 1 (Revised 1996) now split cash flows from investing activities into "capital expenditure and financial investment" and "acquisitions and disposals", and created two new categories, "equity dividends paid" and the aforementioned "management of liquid resources".

Finally, the last significant revision to the standard now required the reconciliation of "net debt" to be disclosed either adjoining the cash flow statement or as a separate note to the accounts. This helped to provide more detailed information regarding the "liquidity, solvency and financial adaptability" of the enterprise (FRS 1, 1996, appendix 3.11).

2.3.3 The U.K. Transition to IFRS and its Effect on Cash Flow Reporting

Until the adoption of International Financial Reporting Standards (IFRS) by the U.K. in 2005, and since the issue of FRS 1 (Revised 1996), there were no major changes to cash flow accounting within the U.K. In July 2002, the issue of *Regulation (EC) No 1606/2002 of the European Parliament and of the Council* required that all listed European firms prepare their consolidated accounts in accordance with IFRS for accounting periods commencing on or after 1 January 2005 (Cox and Pendersen, 2002). All U.K. listed companies were therefore required to undergo a transition from FRS 1 (Revised 1996) to the IFRS equivalent, *IAS 7 Cash Flow Statements*.

Significant differences were noted in the reporting of cash flows between U.K. GAAP and IFRS in a 2005 report by PriceWaterhouseCoopers. Defining "cash flows" was the most significant difference between the two standards, a legacy from the revisions that the ASB had made to the original version of FRS 1 (PriceWaterhouseCoopers, 2005). IAS 7 defined "cash flows" as "cash and cash equivalents" whilst the FRS 1 (Revised 1996) had amended their definition to exclude "cash equivalents" which were reported under the separate category of "management of liquid resources". Much like SFAS No. 95, IAS 7 also required cash flows reported under the three distinct categories of "operating", "investing" and "financing" activities as opposed to the eight stipulated under FRS 1 (Revised 1996). Further, IAS 7 did not

require a separate reconciliation of "net debt" or provide any exemptions to the application of the standard, thereby extending the scope of cash flow reporting requirements in the U.K. to many previously exempt firms. Finally, IAS 7 increased the disclosure requirements for U.K. firms reporting foreign exchange differences, presenting these separately in the reconciliation of the opening and closing cash and cash equivalent balances.

2.4 The Development of Cash flow Reporting in Australia

2.4.1 The Development of Funds Flow Reporting in Australia

Australian funds and cash flow reporting followed a similar cycle to that observed in both the U.S. and U.K., with firms incorporating some form of funds flow statement as part of their annual accounts by the start of the 1970's (Donleavy, 1994, page 98).[10] In January 1971, the Institute of Chartered Accountants in Australia (ICAA) initially recommended funds flow reporting by issuing *Technical Bulletin F1: "The Funds Statement"*. However, funds flow statements only became widespread after the Australian Associated Stock Exchanges amended their listing rules in 1972 to mandate all public companies file one as part of their annual accounts (Walker and Robinson, 1994).[11]

[10] See Table 2-5 for a summary of the development of cash flow reporting in Australia.
[11] The Australian Associated Stock Exchanges was the predecessor to the Australian Stock Exchange (ASX).

Table 2-5 Summary of the development of cash flow reporting in Australia

Key Date	Key Development
1971	Issue of *Technical Bulletin F1: The Funds Statement*, by the Institute of Chartered Accountants in Australia (ICAA) recommended but not mandatory for all public firms
1972	The Australian Associated Stock Exchange mandates the inclusion of a funds flow statement in all listed company accounts
1980	Issue of *Exposure Draft (ED) 16: Statement of Sources and Application of Funds* by the Australian Accounting Research Foundation (AARF) for comment
1983	Issue of *Australian Accounting Standard 12: Statement of Sources and Application of Funds* (AAS12) by AARF applicable to all firms
1985	*The Companies and Securities (Miscellaneous Amendments) Bill* in the Companies Act and Codes is amended by the National Companies and Securities Commission (NCSC) to require all companies to disclose a funds flow statement as part of their annual accounts
1986, June	AAS 12 is approved by the Accounting Standards Review Board (ASRB) and issues *ASRB 1007: Financial Reporting of Sources and Application of Funds.*
1986, July	Issue of *ED 37/Release 410: Proposed Amendment to Statement of Accounting Standards AAS 12 and Approved Accounting Standard ASRB 1007 to require the Disclosure of Cash Flow from Operations* by the ASRB and AARF
1990, October	The ASX proposes that companies should be required to report a cash flow statement rather than a funds flow statement as originally stipulated in their 1972 paper *An Issues Paper: Improved Reporting by Listed Companies*
1991, May	Issue of *ED 52: Statement of Cash Flows* by the AARF for comment
1991, December	Issue of *AASB 1026: Statement of Cash Flows* by the AASB requiring all Australian firms to report a Cash Flow Statement as part of a complete set of company accounts

Table 2-5 (continued)

Key Date	Key Development
1997, October	AASB 1026 is amended to conform with the requirements of International Accounting Standard 7: Cash Flow Statements
2004, July	Issue of *AASB 107: Cash Flow Statements* which is the equivalent of IAS 7
2005, January	Application date for *AASB 107* for annual reporting periods on or after this date
2006, November	Issue of *ED 151: Australian Additions to, and Deletions from, IFRSs* for comment
2007, April	Issue of *AASB Amendment Pronouncement (AP) 2007-4* which amends AASB 107 in response to *ED 151* to allow the use of the Indirect method of cash flow disclosure as well as allowing dividends paid to be classified as either a financing or operating cash flow
2007, July	Application date for *AASB AP 2007-4* for annual reporting periods on or after this date
2007, September	Issue of *AASB AP 2007-8* which amended the title of AASB 107 from *Cash Flow Statements* to *Statement of Cash Flows*

Based on Yap (1994), Belkaoui and Jones (1996), Henderson *et al*. (2004) cited in Farshadfar (2008), in addition to Walker and Robinson(1994) and AASB 107(2009)

Ten years later, responding to comments received back from the issue of *Exposure Draft (ED) 16: Statement of Sources and Application of Funds*, the accounting profession, in the form of the Australian Accounting Research Foundation (AARF), issued *Australian Accounting Standard 12: Statement of Sources and Application of Funds* (AAS12). Funds flow reporting in Australia was, therefore, further standardised whilst the accounting profession had signalled their support for the ASX requirement of their mandatory disclosure (Walker and Robinson, 1994; AASB 107, 2009). Further endorsement of the funds flow statement came from the National Companies and

Securities Commission (NCSC) when, in 1985, they amended the statutory rules to require all companies disclose a funds flow statement with their filed accounts.

Prior to 1985, the AARF largely developed and issued Australian Accounting Standards without any independent regulatory oversight. Regulation of Australian Accounting Standards only started once the Accounting Standards Review Board (ASRB) was formed in 1985 with the mandate to review all the standards issued by the AARF (Walker and Robinson, 1994). One of the first standards reviewed and issued by the ASRB was when they initially endorsed AAS 12 in 1986 and subsequently issued *ASRB 1007: Financial Reporting of Sources and Application of Funds*.

Conflicts between the ASRB and the AARF significantly slowed the transition from funds flow reporting to cash flow reporting in Australia (Walker and Robinson, 1994). SFAS 95 had found favour with the ASRB who were pushing to move away from the funds flow statement and adopt an entirely new method of cash flow reporting. Meanwhile, however, the AARF were content to retain the funds flow statement with modification. Ultimately, the development of cash flow reporting in America, and the 1987 Australian stock market crash, prompted increased pressure from analysts and the public for significant reforms in accounting and auditing (Walker and Robinson, 1994). Reforms were, however, slow as the ASRB and the AARF were still at a deadlock over whether or not to issue a cash flow reporting standard equivalent to SFAS No. 95.

2.4.2 The Development of Cash Flow Reporting in Australia

In response to this deadlock, the ASX intervened yet again and announced in October 1990 that if the ASRB issued an equivalent standard to SFAS No. 95 within the succeeding two years, they would require all listed companies to disclose a statement of cash flows by June 30, 1992 (Walker and Robinson, 1994). Responding to the ASX and

the growing demand for cash flow information, the AARF presented their Exposure Draft 52 *Statement of Cash Flows* in May 1991 and received overwhelming approvals from 96% of the respondents (Walker and Robinson, 1994). In December of the same year, the Australian Accounting Standards Board (AASB) issued *AASB 1026 Statement of Cash flows* which became effective by the ASX deadline.[12] SFAS No. 95 clearly influenced AASB 1026, which required cash flows be disclosed under the same three main headings of "operating", "investing" and "financing" activities, in addition to defining "cash equivalents" as:

> *"...highly liquid investments which are readily convertible to cash on hand..."*
>
> *(AASB 1026, 1991, paragraph 10)*

Disclosing operating cash flows was, however, the significant difference between AASB 1026 and SFAS No. 95. According to AASB 1026 (1991) paragraph 38-39, an entity complying with the standard would be required to present their operating cash flows using the direct method, with a note to the accounts reconciling operating profits and cash flows. Australia did not allow firms to report operating cash flows using the indirect method, although this was already used in the U.S. and U.K.

2.4.3 The Australian Transition to IFRS

Australia harmonised their cash flow reporting requirements with IAS 7, in March 1997, when the AASB issued Exposure Draft 77, followed in October 1997 by the issue of a revised AASB 1026. Consequently, Australia were far more prepared for the transition to IFRS than the U.K. as there were only minor notable differences between AASB

[12] The Australian Accounting Standards Board was formally known as the ASRB.

1026 and IAS 7, which concerned the disclosure of operating cash flows (Deloitte, 2005). Although IAS 7 encouraged the use of the direct method, the standard provided a choice between either the direct or the indirect method, so long as firms consistently applied the chosen approach from one period to the next. AASB 1026, on the other hand, only permitted constituents to use the direct method of disclosing operating cash flows and, much like SFAS No. 95, also required a reconciliation of operating profit to cash flow as part of the notes to the accounts. Classification of dividends paid was another difference between the two standards. Under IAS 7, dividends paid could be classified under either operating or financing activities, while AASB 1026 explicitly required their disclosure as part of the cash flows from financing activities.

Historically, the AASB had required operating cash flow disclosures under the direct method alone. When adopting IFRS, therefore, they issued their own standard on cash flow reporting in the form of *AASB 107 Cash Flow Statements* on July 15, 2004, and maintained their historical position. AASB 107 was equivalent to IAS 7 in all material respects, except it did not allow firms to disclose operating cash flows using the indirect method.

In April 2007, however, in order to align themselves more fully with IFRS, the AASB amended AASB 107 to permit Australian firms to choose between the two approaches. *AASB Amendment Pronouncement (AP) 2007-4* amended AASB 107 in response to *ED 151,* and allowed the use of the indirect method, in addition to requiring the classification of dividends paid as either financing or operating cash flows.

2.5 The Development of Cash flow Reporting by the IASC/IASB

2.5.1 The Development of Funds Flow Reporting by the IASC

Regulation of funds flow reporting in the U.S. and U.K. prompted the newly formed International Accounting Standards Committee (IASC) to issue *Exposure Draft (ED) 7* in June 1976 on the subject.[13] Both the preparers and users of financial statements had already become accustomed to the funds flow statement, so it was unsurprising that comment letters received back for ED 7 showed strong support for the new standard (Camfferman and Zeff, 2007). As a result, in October 1977, the International Accounting Standards Board (IASB) issued *IAS 7 Statement of Changes in Financial Position*, closely following the proposed guidelines laid down by ED 7. However, similar problems experienced in the U.S. and the U.K. occurred with the adoption of IAS 7. The definition of "funds" was vague, arising from what appeared to be a compromise reached by the members of the IASC, of being either "cash", "working capital" or "all financial resources" (Taylor, 1987).

2.5.2 The Issue of IAS 7 "Cash Flow Statements"

Much like FASB and the ASB, the IASC realised they needed to address the problems associated with funds flow reporting and, therefore, they issued *Exposure Draft (ED) 36: Cash Flow Statements* in July 1991 for public comment. Seventeen months later, they followed up ED 36 and issued *IAS 7 Cash Flow Statements*, effective for all financial years ending on or after 1 January 1994.

[13] See Table 2-6 for a summary of funds and cash flow regulation by the IASC.

Table 2-6 Summary of the development of cash flow reporting by the IASC/IASB

Key Date	Key Development
1976, June	Issue of Exposure Draft E7 *Statement of Source and Application of Funds* by the IASC for comment
1977, October	Issue of IAS 7 *Statement of Changes in Financial Position* by the IASC
1991, July	Issue of Exposure Draft E36 *Cash Flow Statements* by the IASC for comment
1992, December	Issue of IAS 7 (1992) *Cash Flow Statements* by the IASC effective for fiscal years beginning on or after 1 January 1994
2007, September 6	IASB renames IAS 7 (1992) "Cash Flow Statements" to "*Statement of Cash Flows"* as a consequential amendment resulting from revisions to IAS 1
2009, April 16	IAS 7 amended by Annual Improvements to IFRSs 2009 with respect to expenditures that do not result in a recognised asset effective for fiscal years beginning on or after 1 January 2010

Adapted from Deloitte (2010)

SFAS No. 95 rather than FRS 1, however, was the dominant influence in the development of IAS 7 leading to both standards employing a very similar definition and classification of cash flows. IAS 7 referred to "cash flows" in their objective as incorporating all inflows and outflows of "cash and cash equivalents" and did not exclude "cash equivalents" as done by FRS 1 (Revised 1996). "Cash equivalents" received the same definition as SFAS No. 95 and included "short-term, highly liquid investments" (IASC, 1992, paragraph 6). Classification of cash flows using the U.S. method of three distinct headings under operating, investing, and financing activities, rather than the eight required by FRS 1 (Revised 1996), was largely supported by comments received back from ED 36 (Donleavy, 1994, page 155). Incorporating this recommendation into the new standard provided IAS 7 with a striking resemblance to

SFAS No. 95. There were, however, some notable differences between these two standards concerning the disclosure of operating cash flows, interest and dividends.

Comments received on ED 36 were varied on the method of reporting operating cash flows. Only one third of respondents to ED 36 favoured the mandatory use of the direct method, with more than half the respondents preferring to allow a choice between either the direct or the indirect method (Donleavy, 1994, page 155). IAS 7, therefore, encouraged the use of the direct method while, at the same time, providing firms with the choice of using either the direct or the indirect method. Departing from the requirements of SFAS No. 95, however, the standard did not require firms to show a reconciliation between operating profit and cash flow if they chose the direct method. Unlike SFAS No. 95, compelling firms to prepare this reconciliation was seen by the IASC as a "disincentive" to adopting the direct method (Donleavy, 1994, page 155).

The other significant differences between SFAS No. 95 and IAS 7 concerned the classification of interest and dividends. IAS 7, paragraph 31, permitted interest and dividends to be classified either under "operating", "investing" or "financing" activities, so long as the chosen approach was applied consistently from one period to the next. FASB, however, argued that operating cash flows should reflect the *"cash effects of transactions...that enter into the determination of net income"* (FASB, 1987, paragraph 88). Thus, SFAS No. 95 only permitted the classification of interest received and paid and dividends received under "operating" activities, while classifying dividends paid as "financing" activities.

Subsequent to the issuance of IAS 7 in December 1992, there were largely minor amendments to the original standard at the time of writing this thesis. In September 2007, the IASB renamed *IAS 7 "Cash Flow Statements"* to "*Statement of Cash Flows"*.

More recently, effective for financial years ending on or after 1 January 2010, the IASB amended IAS 7 to require the disclosure of capital expenditure under investing activities for only those amounts resulting in the recognition of assets (IASB, 2010).

2.6 The FASB and IASB Convergence Project

SFAS No. 95, and the IASB equivalent, IAS 7, are very similar in a number of areas largely due to the significant influence the U.S. standard setters have had on the IASB. In September 2002, subsequent to the issuance of their respective standards on cash flow reporting, both FASB and the IASB entered into the Norwalk Agreement, and committed towards the convergence of U.S. GAAP and IFRS. As part of the convergence process, in October 2008, the IASB and FASB issued a discussion paper for comments on their preliminary views of financial statement preparation (IASB, 2008). Included in this paper, section 3.70-3.83 provided a detailed proposal for a new standard to regulate the disclosure of cash flows.

Besides recommending that "cash flows" should be defined as movements in "cash" only, and not "cash equivalents" (IASB, 2008, paragraph 3.72), there was no surprise that once again the major area of debate concerned the disclosure of operating cash flows. The discussion paper's proposal to mandate the direct method of reporting operating cash flows, once again, brought up the debate of whether or not to provide a choice of using either the direct or the indirect method (IASB, 2008, paragraphs 3.75-3.83). Further, the paper proposes a line by line reconciliation between the statement of cash flows and the statement of comprehensive income, as opposed to simply reconciling operating income and cash flows, as currently required (IASB, 2008, paragraph 3.80).

Improving the level of understanding concerning the relationship between line items on the statement of cash flows, the statement of comprehensive income, and financial position, is a key motive behind the proposed changes to cash flow reporting. The paper argued that the indirect method has a major deficiency due to the lack of disclosure of any of the major operating cash flow components of cash receipts or payments for the period. Operating cash flows reported using the indirect method were likened to reporting the profit or loss for the period by adjusting the annual change in shareholders' equity for the effects of dividend payments and share movements. While such an approach would arrive at the total profit or loss, this method would not reveal a vast amount of useful information for the users of the financial statements (IASB, 2008, paragraph 3.77).

In contrast, the discussion paper argues that disclosing operating cash flows using the direct method more consistently achieves the objectives of financial statement presentation. Examples of such objectives include "cohesiveness", "enabling users to assess the timing, amount and uncertainty of future operating cash flows", and "providing useful information regarding the entities liquidity and financial flexibility". The IASB and FASB considered the assertions regarding the advantages of the indirect method inadequate compared to the benefits of reporting actual operating cash receipts and payments under a directly prepared cash flow statement. Concluding the discussion paper, the FASB and IASB expressed their view that while there are arguments concerning the costs and benefits of implementing systems to report direct cash flows, these costs would most likely be a one-off outlay.

Two hundred and twenty nine public comments were received back from the discussion paper as shown by FASB (2009). Sampling the comment letters from the big

four accounting firms provides interesting insight into the view of the accounting profession regarding the proposed changes to cash flow reporting. Deloitte, KMPG and EY all highlighted the need for the IASB and FASB to further investigate whether the benefits of reporting direct cash flows would indeed outweigh the costs of changing and implementing financial reporting systems to capture the required information (FASB, 2009, comment letters 63, 114 and 99). PriceWaterhouseCoopers, on the other hand, showed strong support for mandating the direct method as proposed in the discussion paper. They did, however, highlight that the level of detail proposed by the discussion paper may be excessive (FASB, 2009, comment letters 172).

In response to the comment letters, a rough version of the FASB Exposure Draft on Financial Statement Presentation issued on July 1, 2010 revealed very little change from the initial discussion paper. With the exception of requiring a less detailed reconciliation to support the direct cash flow statement, the FASB and IASB has made no notable changes. The proposed mandatory use of the direct method was still clearly evident in the Exposure Draft (FASB, 2010, paragraphs 168-199). Changing information systems, or indirectly adjusting the statement of comprehensive income and financial position for accruals and other non-cash transactions, were the two recommended methods of obtaining the necessary information to disclose direct cash flows.

2.7 Summary and Conclusion

Cash flow reporting is, historically, the oldest form of accounting for transactions, dating back to medieval times. However, it was not until 1963 that the APB in the U.S. issued the first standard to govern the reporting of cash flows in the form of Opinion No.

3 *"The Statement of Source and Application of Funds"*. Australia and the U.K. followed suit around ten years later and issued *Technical Bulletin F1: The Funds Statement* in 1971 and *SSAP 10: Statements of Source and Application of Funds* in 1975 respectively.

Since their inception, similar problems plagued the various funds flow standards, with the main issues concerning the very vague definition of "funds" and the lack of clear guidance in their application. Addressing these problems, the standard setters in America, U.K. and Australia all issued superseding "cash" flow disclosure requirements towards the end of the 1980's and start of the 1990's. America, in the form of SFAS No. 95, having led the way, heavily influenced the standards on cash flow reporting subsequently issued around the world.

In the 1990's, U.S., Canada, U.K. and Australia, known as the "G4", committed to the harmonisation of accounting standards, along with the International Accounting Standards Committee (IASC), based on their similar conceptual frameworks (Street and Shaughnessy, 1998). Towards the end of the 20th century cash flow reporting was an area in which the G4 and the IASC had clearly gained rapid consensus, resulting in only minor notable differences between the various standards. More recently, with the growing acceptance and adoption of IFRS around the world, the U.K. and Australia have both been reporting their cash flows according to IAS 7. Australia, however, restricted the choice of disclosing operating cash flows to the direct method until the issue of *AASB Amendment Pronouncement (AP) 2007-4*, which amended AASB 107, thereby allowing the use of the indirect method of cash flow disclosure.

Operating cash flow disclosure is one area in cash flow reporting that has been the subject of fierce debate by standard setters, preparers and users of financial accounts. Central to this debate is whether to allow or remove the choice of disclosing operating

cash flows “indirectly” or “directly”. Indirect reporting requires a reconciliation between profits and net operating cash flow by adjusting for the effects of accrual accounting and other non-cash transactions. The direct method, however, requires the disclosure of the actual gross cash receipts and payments on the face of the cash flow statement, supported with a supplemental “indirect” reconciliation.

Currently, as part of the continuing harmonisation of U.S. standards with IFRS, both FASB and the IASB have proposed to settle the debate finally by removing the option to disclose operating cash flows using the indirect method and mandate the direct method for all companies. Comments received back in response to the Exposure Draft, entreated the FASB and IASB to reconsider whether the benefits of disclosing operating cash flows “directly” would exceed the associated costs of capturing and recording the requisite information. Establishing, therefore, which approach provides more useful information is not easily resolved.

3
Literature Review

3.1 Introduction

Over the past two decades, there has been growing interest concerning the usefulness of information provided from reporting operating cash flows using the direct method. Even before the standardisation of cash flow disclosures, a number of academic papers, examining various reporting formats for operating cash flows, had each expressed a definitive preference for the direct method (Paton, 1963; Heath, 1978; Lee, 1981; Thomas, 1982; Ketz and Largay III, 1987).

Before and after the regulation of cash flow reporting, there are three distinct avenues within which researchers have sought to measure the usefulness of estimated and reported operating cash flows, in addition to their components. Reviewing the extant literature up to 1990, investigating the usefulness of operating cash flows, Neill *et al.* (1991) summarised the published studies into three categories: the effects of cash flows on capital markets; their usefulness in forecasting future cash flows; and finally, their usefulness in predicting corporate failure. However, a crucial area they did not discuss was the benefits of reporting cash flows using the direct method, due to the lack of empirical research examining the usefulness of this information.

Surveys and case studies were the two initial methods used to assess the usefulness of cash flows disclosed using the direct method. Lee (1981) surveyed a group of Chartered Accountants in Scotland, and found that 80% of respondents were in favour of the model cash flow statement using the direct method provided in the paper. Moreover, the remaining respondents actually suggested a more detailed presentation of

operating cash flows (OCF) would be more useful. By contrast, however, a replication of this study on a group of U.S. audit partners, shortly after the release of SFAS No. 95, found that 57% favoured the indirect method (McEnroe, 1989).

Subsequent U.S. surveys, however, contradicted these initial findings, including a follow up study by McEnroe (1996) with increased sample size and diversity, covering academics, accountants, analysts and investors. McEnroe (1996) found 56% of respondents were in favour of reporting OCF using the direct method, a notable shift in preference from the 1989 results. Further, survey results reported by Smith and Freeman (1996) using a group of U.S. finance directors in 1993, provided additional support for the direct method. When compared with the indirect method, most respondents indicated the direct approach presented more concise, better quality, and understandable information. They also indicated support for a hybrid form of cash flow reporting, presenting operating cash flows directly, but also providing a supplementary reconciliation between the operating profit and cash flow for the period.

Similar surveys conducted in Australia, where direct cash flow statements were mandatory, provided further support for the direct method (Jones *et al.*, 1995; Jones and Ratnatunga, 1997; Jones and Widjaja, 1998; Goyal, 2004). Respondents noted, that, the direct method was easier to understand and analyse and, when compared with the indirect method, provided information that was useful to forecast future insolvency more accurately.

More recently, as part of the convergence project between IFRS and U.S. GAAP, the Institute of Chartered Financial Analysts (CFA Institute) surveyed their members for opinions on the usefulness of information reported by direct cash flow statements. Results published in July 2009 show that, out of 541 respondents, 63% either “strongly

agreed" or "agreed" that information provided by the direct method would improve the accuracy of future cash flow forecasts and be useful to measure earnings quality (CFA Institute, 2009). Moreover, 94% voted "Revenue collections from customers", information only available under the direct method, to be the most important information disclosed under the cash flows from operating activities.

In addition to these surveys, a few case studies have also investigated the decision usefulness of information provided by the direct and indirect method. Soon after the issuance of SFAS No. 95, Klammer and Reed (1990) used a fictitious case of a firm seeking a $5 million bank loan, in order to examine the differential usefulness of direct and indirect cash flow statements. After presenting this case to a group of bank analysts and loan officers, they provided half the group with a direct cash flow statement, and the remainder with an indirect cash flow statement. Their results show far greater consistency in the loan size granted between members using the direct cash flow statement as compared with the members using the indirect cash flow statement.

In a real life scenario, Trout *et al.* (1993) report that, after providing the bank with a direct cash flow statement, Chicago Central & Pacific Railroad Company received a critical loan that helped resolve their liquidity crisis. Management used the direct cash flow statement to identify the cause of the firm's cash flow budget variances, enabling a successful negotiation of a recovery package.

However, in contrast to these case studies, Kwok (2002) reported no participants in her behavioural study used information provided by the direct method when arriving at their final lending decision. By using a verbal protocol analysis methodology, she observed the decision making process of a group of twenty loan officers, analysts, academics and auditors. None of the subjects noted the difference between the two

methods of disclosing cash flows. Rather, they based their final lending decisions on information from the balance sheet and notes and derived any cash flow information indirectly.

3.2 Empirically Examining the Usefulness of Operating Cash Flows

The survey results and case studies findings highlight that users and preparers of financial accounts generally prefer the direct method. Unsurprisingly, therefore, standard setters' have promoted this approach ahead of the indirect method. However, the decisions by the FASB, FRC and IASC to allow the indirect method as an alternative, has motivated many papers to examine the comparative usefulness of these two options.

Prior to the empirical studies investigating the usefulness of direct cash flows, Neill *et al.* (1991) summarised the initial literature examining the usefulness of aggregate operating cash flows. Studies were categorised into three broad fields of those examining the usefulness of cash flows in predicting future cash flows and earnings, explaining capital market effects, and predicting corporate failure. Using the former two classifications, the next subsections extend the literature review by providing an overview of the research investigating the usefulness of reporting direct operating cash flows.

3.2.1 Using Cash Flow Data to Forecast Future Cash Flows and Earnings

An assertion FASB made in their Statement of Financial Accounting Concepts (SFAC) No. 1, motivated the initial empirical papers examining the usefulness of aggregate operating cash flows. Information from accrual accounting was claimed to provide a superior basis for estimating future cash flows when compared with the information

from the historical cash receipts and payments (FASB, 1978, paragraph 9). Since SFAS No. 95 only became effective from July 1988, the initial papers testing this assertion estimated the value of operating cash flows used as the dependent variable. Questions were raised, however, concerning the findings based on estimated proxies for operating cash flows rather than the actual amounts reported in the cash flow statement (e.g., Austin and Bradbury, 1995; Mitchell *et al.*, 1995; Bahnson *et al.*, 1996; Hribar and Collins, 2002). By estimating operating cash flows from data after the standardisation of cash flow reporting, results showed significant differences between these proxies and the actual reported values. It is imperative, therefore, to differentiate between studies using proxies for operating cash flows and those using reported operating cash flows.

Bowen *et al.* (1986), Greenberg *et al.* (1986), Lorek *et al.* (1993), Finger (1994), Lorek and Willinger (1996), and Dechow *et al.* (1998) all examined the usefulness of operating cash flows to forecast future cash flows by using estimated proxies for operating cash flows. Greenberg *et al.* (1986) and Bowen *et al.* (1986) provided two of the first papers which empirically tested the FASB assertion that earnings were superior to cash flows in forecasting future cash flows. Both of these papers used parsimonious cross-sectional models that employed either total earnings or total operating cash flows as explanatory variables. Greenberg *et al.* (1986) compared the ability of historical earnings and cash flows to predict cash flows for up to five years. Comparing the coefficients for each regression, their results supported the assertion that earnings provided a better basis to forecast cash flows for all but the fourth year forecast.

In contrast, Bowen *et al.* (1986) concluded that, based on their model forecasting one and two year cash flows, their results failed to uphold FASB's assertion. Pairwise sign tests, comparing cash flow prediction errors by using either net income or a proxy for

operating cash flows as explanatory variables, revealed no significant difference between the two models. Rather, the lowest reported forecast errors came from the models using working capital from operations or net income before depreciation and amortisation as explanatory variables.

3.2.1.1 Using Time Series Models to Forecast Cash Flows

Using a longer time horizon, Finger's (1994) results, based on more than 50 firm-year observations ending in 1987, the year before cash flow reporting became mandatory, again failed to uphold FASB's assertion. Unlike previous studies, using cross-sectional models with one year lagged explanatory variables, Finger (1994) used time series models with either two years of lagged cash flows or earnings to forecast cash flows for up to eight years. Comparing the distribution of the root mean squared errors between the two models, revealed that historical cash flows more accurately forecast future cash flows for short time horizons, whereas historical earnings and cash flows were equivalent predictors for longer time horizons.

Both Lorek *et al.* (1993) and Lorek and Willinger (1996) further examined the predictive ability of earnings and cash flows by using time series, rather than cross-sectional models, to control for individual firm variability in the explanatory variables. Unlike most studies, which used annual earnings and cash flows, they used quarterly data. Lorek *et al.* (1993) found that a seasonal univariate autoregressive model yielded the lowest mean absolute percentage error (MAPE) when compared to other time series and cross-sectional models predicting operating cash flows. Extending this study, Lorek and Willinger (1996) found that their multivariate time series prediction model yielded an even lower MAPE. Their paper was one of the first studies to disaggregate accruals and incorporate historical accrual components as explanatory variables in a cash flow

forecasting model. Cash flow prediction significantly improved after including the lagged values of receivables, inventory and payables, providing evidence for FASB's high view of the predictive content available from accrual accounting.

Using firm specific time series prediction models based on annual rather than quarterly data, Dechow *et al.* (1998) reported further evidence that historical earnings provided incrementally more predictive information than historical cash flows. Although their sample spanned both the pre and post SFAS No. 95 reporting period, they still estimated their proxy for operating cash flows and found that earnings were consistently more informative than cash flows in forecasting cash flows up to three years into the future.

3.2.1.2 Disaggregating Earnings and Operating Cash Flows

Most of the studies, up to and including Dechow *et al.* (1998), examined the incremental predictive power of earnings versus cash flows by using parsimonious cross-sectional or time series regression models, with few explanatory variables. Towards the start of the 21st century, however, the incremental information content within the components of total earnings and cash flows became an area of growing interest, resulting in an extension of more complex prediction models. Barth *et al.* (2001b) and Krishnan and Largay III (2000) presented two of the first papers that developed these models, while at the same time using reported rather than estimated operating cash flows proxies.

Barth *et al.* (2001b) expanded the model popularised by Dechow *et al.* (1998) by disaggregating total earnings into seven major components – changes in accounts receivable, changes in inventory, changes in accounts payable, depreciation, amortisation and other accruals – and total operating cash flows. After disaggregating

total earnings into these seven explanatory variables, their results showed an increase in the predictive model's goodness of fit, as measured by the adjusted R^2. Compared with models using either total earnings or total cash flows as independent variables, the model with disaggregated earnings revealed the highest adjusted R^2. Overall, these findings supported FASB's assertion that total earnings and its "components" would help improve the prediction of future cash flows more than historical cash flows alone.

In addition to Barth *et al.* (2001b), Krishnan and Largay III (2000) disaggregated earnings, but focussed primarily on disaggregating total operating cash flows, in their cross-sectional cash flow prediction models. They presented the first empirical study to examine the incremental information content of direct cash flow components in cash flow prediction models. Since most U.S. firms report operating cash flows under the indirect method, Krishnan and Largay III (2000) used a restricted sample of 405 firm-year observations which chose the direct method between 1988-1993. By comparing two cash flow prediction models - one using the actual reported operating cash flow components from the direct method, and the other using indirect method variables for the same firms - they found that using direct cash flow components yielded higher adjusted R^2. Further, following a similar methodology to Lorek and Willinger (1996), MAPE results were compared across different cash flow prediction models, with and without incorporating the components from the direct cash flow statement. Including direct operating cash flow components, however, consistently and significantly improved the accuracy of the cash flow prediction model, beyond those using aggregate cash flows alone. Since they were restricted to using a small sample of firms reporting direct cash flows, Krishnan and Largay III (2000) extended their tests by estimating direct cash flow components for a far larger sample, finding similar results.

Cheng and Hollie (2008) provide further evidence of the usefulness of direct operating cash flow components in predicting cash flows, extending Barth *et al.*'s (2001b) model by disaggregating total operating cash flows into "core" and "non-core" components. Their algorithms used to estimate the operating cash flow components were very similar to those used by Krishnan and Largay III (2000) when they estimated the direct cash flow components.[14] "Core" operating cash flow components included their estimates for cash receipts from customers, cash paid to suppliers, and cash paid for operating and administrative expenses, whilst "non-core" operating cash flows included interest paid, taxes paid, and other operating cash flows. Pair-wise tests of the difference in coefficients from the annual cross-sectional regressions of a large sample of U.S. firms showed, that, core operating cash flow components persisted more highly into future cash flows than non-core operating cash flow components. Comparing the adjusted R^2 of all their models, their results showed the highest adjusted R^2 for the model using disaggregated operating cash flows and aggregate accruals as explanatory variables, although this model also yielded the highest out of sample prediction error. However, when using in sample prediction tests, they showed a notable improvement in cash flow forecast accuracy after disaggregating total cash flows into their component parts, especially for firms with high cash flow volatility.

By including dividend receipts, as well as the disaggregated components of net interest as independent variables in their regression, Arthur and Chuang (2008) build on Cheng and Hollie's (2008) model. Using a sample of Australian firms, where the direct

[14] For example, Cash receipts from customers were calculated as sales less any changes in accounts receivable. Cash paid to suppliers was calculated by deducting any changes in accounts payable from the cost of goods sold. Cash paid from operating and admin expenses were calculated as operating expenses minus any changes in net operating working capital, excluding changes in trade accounts receivable, inventory, tax payable and interest payable (Cheng and Hollie, 2008).

method of cash flow presentation was mandatory, they produced the first paper to overcome the sample self-selection bias inherent in prior U.S. studies that used samples of firms choosing to use the direct method. Moreover, since Australian firms all reported their operating cash flows according to the direct method, they used actual, rather than estimated, direct cash flows for their explanatory variables. Comparing the respective adjusted R^2 of their annual cross-sectional models their findings showed the highest explanatory power when operating cash flows were disaggregated into their direct components. Moreover, they found the components of "Cash receipts from customers" and "Cash payments to suppliers and employees" were significant in predicting future operating cash flows across all their regressions.

Using a far larger sample of 3,672 firm-year observations from Australian listed companies between 1992 and 2005, Arthur *et al.* (2010) further examine the incremental benefits of reporting direct cash flow components. However, in contrast with prior studies, Arthur *et al.* (2010) examined and compared the ability of net and gross direct cash flows to forecast future earnings, rather than future cash flows. Results from both their pooled and annual cross-sectional models revealed higher explanatory power, as measured by the adjusted R^2, when using disaggregated direct cash flows compared to aggregate operating cash flows as independent variables. Moreover, their results show that a higher disaggregation of operating cash flows resulted in a lower MAPE and therefore a higher predictive accuracy of future earnings. Following Cheng and Hollie (2008), and classifying cash flows into core and non-core components, they further noted that the model with "core" cash flows along with disaggregated "non-core" components persisted more highly into future earnings, than the model with aggregate cash flows. Combining cash receipts and payments into "core" cash flows, however,

yielded almost the same explanatory power as disaggregating "core" cash flows into "cash received from customers" and "cash paid to suppliers and employees."

Orpurt and Zang (2009) also examined the predictive value of direct cash flow components to forecast future cash flows and earnings. Conducting their research in the U.S., their sample of 470 firm-year observations was restricted to entities employing the direct cash flow method from 1989-2002. To examine whether direct cash flows were incrementally informative to indirect cash flows, they calculated "articulation errors" for their sample of firms. Articulation errors are the difference between the reported direct cash flows and those estimated from the financial information available in the income statements, balance sheets, and indirect cash flow statements. By adjusting their estimated direct cash flows for these articulation errors, they were able to examine whether there was a significant difference between the predictive abilities of actual and estimated direct cash flows. Including the articulation errors as independent variables resulted in a significant increase in the explanatory power of the predictive models, providing further evidence to support the usefulness of the information content found within the components of a direct cash flow statement.

Recently, however, Lorek and Willinger (2009) criticised these multivariate cash flow prediction models which show increased explanatory power after disaggregating earnings or cash flows. They provide evidence that, although disaggregating earnings provides a high "goodness of fit" as measured by the adjusted R^2, this does not necessarily lead to an improved out of sample predictive accuracy. Using quarterly data, and a parsimonious model as was common pre Barth *et al.* (2001b), they revealed a significantly lower MAPE for their out of sample predictive tests than when using the more complex model as popularised by Barth *et al.* (2001b). Lorek and Willinger (2009)

also found that a time series model, rather than cross-sectional regression models, resulted in the highest increased out of sample predictive accuracy as they were able to better control for individual firm variability in the explanatory variables. Farshadfar and Monem (2013) and (2012) use both in and out of sample predictive tests to examine the usefulness of direct cash flow components to predict future cash flows. Using a sample of 348 listed Australian firms between 1992 and 2004, they find that disaggregating operating cash flows into direct cash flow components significantly improves the accuracy of both the in and out of sample predictive tests.

3.2.2 Using Cash Flow Data to Explain Capital Market Effects

Historical cash flows and earnings provide useful information to help forecast future cash flows and earnings, when evaluating both future performance and current firm value. Consequently, a number of studies have examined the association between market returns and historical cash flows and earnings. Ball and Brown (1968) produced one of the first seminal papers in this field, empirically examining the association between accounting numbers in the form of annual net income and company stock returns. Their findings emphasised the value relevance of historical accounting information, and demonstrated a strong link between accounting earnings and stock price movements. By approximating cash flows as equivalent to operating income, Ball and Brown (1968) further found that net income was superior to their cash flow proxy when predicting the sign of abnormal stock returns. Extending the work of Ball and Brown (1968), Beaver and Dukes (1972) examined the information content of different measures of net income. Once again, changes in net income had the highest association with abnormal stock returns, as compared with changes in their cash flow proxy calculated as net income before depreciation, amortisation and deferred taxation.

3.2.2.1 Information Content Studies and Disaggregating Total Earnings

Subsequent research in this area further developed these initial studies by investigating the incremental information provided by income and cash flow variables when explaining stock returns. Two of the first such papers were the studies by Patell and Kaplan (1977) and Beaver *et al.* (1982). Defining cash flows as working capital, Patell and Kaplan (1977) found no evidence that percentage changes in cash flows provided incremental information to earnings when explaining stock returns. Beaver *et al.* (1982), however, defined cash flows as net income before depreciation and amortisation, and found weak evidence that percentage changes in cash flows did provide incremental information to earnings when explaining annual stock returns. A significant limitation of these initial papers, however, concerns their definitions for "cash flows". These variables were highly correlated with earnings and, when explaining stock returns, were therefore unlikely to provide incremental information to earnings (Christie *et al.*, 1984).

Following a similar progression to the cash flow prediction literature, capital market studies also disaggregated total earnings to investigate the information content of these components when explaining stock returns. Rayburn (1986), Wilson (1986), Wilson (1987), Bowen *et al.* (1987), and Bernard and Stober (1989) were some of the first studies to examine the effect of disaggregating earnings into operating cash flows and accruals on traditional abnormal stock returns models.

Defining cash flows as earnings before depreciation, amortisation and working capital movements, Rayburn (1986) found a significant association between abnormal stock returns, total cash flows and total accruals. While this study did not specifically compare the information content of cash flows and accruals with total earnings, Wilson (1986), Wilson (1987), and Bowen *et al.* (1987) addressed this in their papers. By using

daily stock returns, Wilson (1986) and Wilson (1987) compared the market reaction between the earnings announcement date and annual report release date. This allowed them to measure the impact of any incremental information released from reporting the disaggregated earnings components of accruals and operating cash flows in the latter report. Their findings show that accruals and operating cash flow components provided significantly more information than total earnings alone.

Moreover, Bowen *et al.* (1987), reverting back to an annual event window, found further evidence that unexpected operating cash flows provided incremental information content to explain abnormal stock returns beyond aggregate unexpected earnings. However, Bernard and Stober (1989) failed to find any significant association between unexpected cash flows and abnormal stock returns when extending Wilson's (1987) model over a greater time period, implying that Wilson's (1987) results may have been sample specific.

Dechow (1994) further extended the literature by examining the association of realised, rather than unexpected or abnormal, stock returns with quarterly and annual earnings and operating cash flows. Compared with prior research, which focussed on the relative information content of operating cash flows, earnings and accruals, Dechow (1994) set out to establish which variable provided the single best measure of firm performance. Given that the sample ended just after the introduction of SFAS No. 95, cash flows were estimated as operating income before depreciation less interest, taxes, and non-cash changes in working capital. Results from the cross-sectional regressions and Vuong (1989) tests show historical earnings to be the superior measure of firm performance. Providing further evidence of the high association of stock returns with earnings, Sloan (1996) argued that investors "fixated" on earnings when assessing firm

value, effectively ignoring the information found in the components of total earnings. Once total earnings were disaggregated into accruals and cash flows, he found that firms with high/(low) levels of accruals, relative to cash flows in historical earnings, experienced significantly negative/(positive) future abnormal stock returns. Disaggregating earnings clearly provided incremental information beyond that available in total earnings.

3.2.2.2 Disaggregating Operating Cash Flow into the Direct Method Components

Most empirical research examining the capital market effects of the release of earnings and cash flow information investigated the information content of aggregate earnings, cash flows and accruals, rather than their disaggregated components. Livnat and Zarowin (1990), however, presented the first paper which tested the differential explanatory power of estimated direct cash flow components when explaining market returns. Their initial findings revealed statistically significant associations between cumulative abnormal stock returns and the unexpected cash collections from customers, payments to suppliers and employees, interest payments and other unexpected operating cash flows. Moreover, analysis of variance tests showed that direct cash flow components provide incremental information beyond aggregate operating cash flows when explaining cumulative abnormal stock returns.

Besides Livnat and Zarowin (1990), who estimated their direct cash flow components, no prior studies had examined whether direct cash flow components provided incremental information to aggregate operating cash flows when explaining capital market returns. Addressing this question would provide standard setters with useful evidence for the debate of whether or not to mandate the direct method of cash flow reporting. Clinch *et al.* (2002), therefore, extended Livnat and Zarowin's (1990)

study by examining a large sample of listed Australian firms from 1992-1997, where they could use actual, rather than estimated direct cash flows.

Clinch *et al.* (2002) reported a significantly strong positive association between annual stock returns and the variables for cash collections from customers and cash paid to suppliers and employees. Chi-square tests of coefficient equality, however, revealed that while the disaggregated accruals provided incremental information for all firms, disaggregating cash flows only provided more information for mining firms. For industrial firms, disaggregating cash flows did not provide any further information when explaining stock returns. However, when controlling for the predictive power of the cash flow components, they found that when direct cash flow components provided incremental predictive power, they also provided further information to explain stock returns. Finally, following Livnat and Zarowin (1990), they estimated direct cash flow components. When comparing the actual and estimated direct cash flows components across all firms, they found that as the difference between the two increased, the incremental information provided by the actual direct cash flow components also increased. Direct cash flow statements, therefore, clearly provided value relevant information, and more so when more difficult to accurately estimate.

More recently, for a sample of U.S. firms, Orpurt and Zang (2009), in addition to establishing the usefulness of direct cash flows in forecasting future cash flows and earnings, examined the capital market effects on firms reporting direct cash flows. Using dummy variables, they investigated whether stock prices reflected more future earnings information for firms reporting direct cash flows compared with those using the indirect method. For firms using the direct method, they demonstrated a strong correlation between future earnings and current stock returns, as well as between future

operating cash flows and current stock returns. Investors, therefore, could more accurately forecast earnings for firms reporting direct cash flows, resulting in stock prices that better reflected future performance expectations, compared with firms reporting indirect cash flows.

3.3 The Impact of Adopting IFRS

All the most recent studies, to date, examining the usefulness of direct cash flow reporting, have specifically excluded firm-year observations under IFRS (Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). Justifying their decision to exclude the years since Australia adopted IFRS from their sample, Arthur *et al.* (2010) reason that:

> *"…from this date, the measurement of both earnings and accruals changed"*
>
> *(Arthur et al., 2010, page 15).*

The potential impact of the mandatory, large-scale, adoption of IFRS received growing attention when, in July 2002, the European Parliament and Council announced that all listed European firms must prepare their consolidated accounts using IFRS on or after 1 January 2005. Immediately following this news, the Financial Reporting Council in Australia also announced that Australian companies would be required to comply with IFRS by the same deadline.

One of the main objectives of the International Accounting Standards Committee (IASC) Foundation as defined in their Foundation Constitution is:

> *"…to develop, in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require high quality, transparent and comparable information in financial statements and other financial reporting to help participants in the world's capital markets and other users make economic decisions"*
>
> *(IASC Foundation, 2009, paragraph 2a)*

From this definition, it is clear that the IASC believed that IFRS accounts should provide information to help users make sound economic decisions given their high quality, transparency and comparability between firms. Paragraphs 15-18 of the IFRS reporting framework, further emphasises that the decision usefulness of financial information is one of the main objective of IFRS (IASB, 1989). Repeated throughout these paragraphs, in order to meet this objective, is the aim that IFRS accounts should provide users with information to help evaluate an entity's future cash generating potential.

A growing number of studies have empirically tested these assertions, by examining the economic impact made by IFRS, and the change in reporting quality after either the voluntary or the mandatory adoption of IFRS, by firms around the world. Armstrong *et al.* (2010) presented one of the first papers to reveal investors' perceptions towards the adoption of IFRS by analysing European market reactions to 16 separate announcements between 2002 and 2005, indicating the likelihood of IFRS adoption in Europe. Investors could interpret the mandatory adoption of IFRS as either increasing or decreasing the quality of financial reporting. If investors' thought IFRS would improve reporting quality, they would react positively to the adoption announcements

as they anticipated the reduced information asymmetries and lower cost of capital from the increased quality. Alternatively, if investors thought IFRS would reduce reporting quality, by applying a one size fits all approach to very diverse reporting environments, they would react negatively to these same announcements. Using a large sample of firms, Armstrong *et al.* (2010) observed significantly positive market reactions surrounding the announcements of the mandatory adoption of IFRS by the E.U. Their findings clearly supported the former view, that investors perceived IFRS adoption would improve the quality of financial reporting in Europe.

Armstrong *et al.*'s (2010) results are consistent with prior research which found that voluntarily adopting IFRS led to better quality financial reporting. Examining the economic consequences of voluntary IFRS adoption, Barth *et al.* (2008) used a large sample of international firms that chose to early adopt International Accounting Standards (IAS) between 1994 and 2003. Compared to the pre-adoption period, and a matched sample of non-adopting firms, first time IAS adopters showed lower levels of earnings management, recognised losses in a timelier manner, and had more value relevant accounting numbers. Early voluntary IAS adoption evidently improved the financial reporting quality of these firms.

Further to the research examining the economic consequences of voluntarily IFRS adoption, a growing number of studies investigated the impact of mandatory IFRS adoption. Some of the more recent research in this field include papers by Daske *et al.* (2008), Bissessur and Hodgson (2011), Beuselinck *et al.* (2009), Li (2010), Cotter *et al.* (2012), and Yang (2010). By comparing the pre and post-adoption period, these studies investigate whether, and to what extent, IFRS adoption changed the quality of financial reporting. To address this broad question, the aforementioned papers may be

categorised as examining the economic effects, the capital market effects, and the effects on analyst forecast errors, arising from mandatory IFRS adoption.

3.3.1 Economic Effects from Mandatory IFRS Reporting

Daske *et al.* (2008) presented one of the most comprehensive and widely cited studies examining the economic consequences of the mandatory adoption of IFRS around the world, using a large global sample of firms adopting IFRS in 2005, and a control sample of firms which did not. Four different proxies measured liquidity and cost of capital, while a standard book to market ratio was used for Tobin's Q. Their findings revealed a significant increase in market liquidity after IFRS adoption. Moreover, in the year prior to the adoption of IFRS, cost of capital decreased and Tobin's Q increased. These results support the IASC's assertions that adopting IFRS would lead to improved financial reporting quality, reduced information asymmetries, and enhanced global comparability across firms. Further, although liquidity improved post-IFRS adoption, the market appeared to have anticipated the informational benefits of IFRS reporting before the mandated change had actually occurred. However, Daske *et al.* (2008) found that the capital market benefits associated with the implementation and adoption of IFRS, only held when the accounting standards were actively enforced.

In support of these findings, Li (2010) examined the effect of mandatory IFRS adoption on the cost of equity capital, using a sample of European firms, and found a significant decline in the cost of equity capital in the post-IFRS adoption period. Prior to the mandatory adoption of IFRS in 2005 there was a significant difference between the cost of equity capital of mandatory and voluntary IFRS adopters, but there was no difference after 2005. Moreover, consistent with Daske *et al.* (2008), the significant

decrease in cost of equity capital for mandatory adopters was directly related to the strength of the legal enforcement of the accounting standards.

3.3.2 Capital Market Effects from Mandatory IFRS Reporting

Bissessur and Hodgson (2011) and Beuselinck *et al.* (2009), meanwhile, investigate capital market effects by examining the change in stock market synchronicity pre and post-IFRS. Using a sample of listed Australian companies from 1999 to 2008, Bissessur and Hodgson (2011) followed Durnev *et al.* (2003) and Piotroski and Roulstone (2004) to construct their proxy for stock market synchronicity. Since IFRS adoption, after an initial decrease in synchronicity, they found a significant and sustained increase in market synchronicity, implying that IFRS improved the comparability of financial statements between firms. Moreover, in additional tests, they found that analysts' earnings forecast errors decreased significantly, by 17%, post-IFRS. Taken together, these results show a significant improvement in the information content available to sophisticated users, and higher comparability between financial statements, since the adoption of IFRS by Australia.

In a comparable European study between 2003 and 2007, Beuselinck *et al.* (2009) also found, after an initial decrease, there was a significant and sustained increase in stock market synchronicity post-IFRS. Moreover, firms with high analyst forecasting activity experienced a greater increase in stock market synchronicity than those with lower activity. Further, firms with large levels of institutional share ownership experienced an initial increase in stock market synchronicity in the year of IFRS adoption, returning to the pre-adoption levels in subsequent years. While analysts helped increase market synchronicity by disseminating firm specific information across the industry, institutional shareholders withheld private information thereby decreasing

market synchronicity. Overall, these results are consistent with Bissessur and Hodgson (2011) and show a sustained and significant increase in the levels of comparability of financial statements between firms, after adopting IFRS.

3.3.3 Impact on Analyst Forecast Errors from Mandatory IFRS Reporting

Cotter *et al.* (2012) and Yang (2010) further investigated the impact of mandatory IFRS adoption by examining the change in analyst forecast errors. Using a sample of listed Australian companies between 2004 and 2007, Cotter *et al.* (2012) found that, while there was no change in forecast dispersion, analyst forecast errors were significantly lower in both the adoption and post-adoption years, compared with the transition year 2005. These findings supported Bissessur and Hodgson (2011) who also found a significant decline in analyst forecast errors post-IFRS in Australia.

Using a global sample of firms adopting IFRS in 2005, Yang (2010) further corroborated these results, finding a significant increase in the accuracy of analysts' earnings forecasts and decrease in their dispersion post-IFRS. Moreover, the average analyst following significantly declined post-IFRS. Better quality financial reports under IFRS meant analysts required more time seeking firm specific information unknown to their peers, thereby reducing the number of firms they could follow. Consistent with prior studies, these results were significantly stronger for firms reporting in countries with a common law framework and strong shareholder protection rights. Clearly, the anticipated benefits associated with the adoption of IFRS are significantly impacted by the heterogeneous reporting environments between countries, particularly the enforcement framework for financial reporting (Pope and McLeay, 2011).

3.4 Summary and Conclusion

From these, and other empirical studies, it is evident that adopting IFRS reporting does result in a significant improvement in financial reporting quality. Providing evidence for this improvement are studies that show an impact on economic factors, capital markets and accuracy of analyst forecasts. Moreover, although the environment for legal reporting enforcement significantly influences these benefits, global IFRS reporting does appear to have reduced information asymmetries and increased cross firm and country comparability.

Further to establishing the improvements in financial reporting quality associated with IFRS adoption, a separate body of literature has been examining the usefulness of cash flows and their component parts. Initially examining the information content of aggregate earnings, these studies later evolved by using disaggregated earnings. Responding to various assertions made by standard setters, they first disaggregated earnings into accruals and operating cash flows, and then into accrual and cash flow components. They then examined the usefulness of both the aggregate and disaggregated components to explain stock returns and the accuracy of future earnings and cash flows forecasts. From these papers, a small and growing body of research has been developing which specifically examines the usefulness of operating cash flows reported using the direct method.

Accounting standard setters claimed that operating cash flows reported using the direct method provides information that would be more useful in estimating future cash flows than under the indirect alternative. Such a bold assertion provided strong impetus for the subsequent studies that sought to test whether direct cash flows were actually as useful as the standard setters made them out to be. From the results presented in the

literature so far, there is strong consensus that direct cash flows do provide information that is useful in estimating future cash flows beyond that found under the indirect alternative. However, no studies have yet tested whether, subsequent to the adoption of IFRS, the usefulness of reported direct cash flows has changed. Currently the IASB and FASB have both advocated mandating the direct method of cash flow reporting as part of their convergence project. This proposal has raised a vast amount of criticism, thereby highlighting the need for research that examines the usefulness of reporting cash flows under the direct method.

4
Sample Selection and Descriptive Statistics

The purpose of this chapter is to provide a high-level overview of the core sample used in this thesis, before applying more restrictive data requirements applicable to the methodology used by subsequent chapters. An outline is presented of the filtering process used to arrive at the core sample used in this thesis, followed by a graphical illustration and discussion of key descriptive statistics. Accordingly, while this chapter presents an overview of the thesis sample, chapter five to seven discuss more detailed descriptive statistics for the samples used each chapter.

4.1 Sample Selection

Given that the direct method of reporting operating cash flows was mandatory in Australia until 2007, the sample used in this thesis is comprised exclusively of Australian firms. Initially, a list of 652 companies, included on the ASX300 index from 31 December 2000 to 31 December 2010, was downloaded from DataStream. From this sample, 17 foreign domiciled firms were excluded, as they do not follow Australian GAAP. Next, 137 financial, and 14 utilities firms were identified by their Industry Classification Benchmark (ICB) codes and removed. Financial firms were removed because of their different reporting requirements, and utility firms excluded given their oligopolistic status. Eight firms were then identified as switching from the direct to the indirect method of reporting operating cash flows, since an amendment to AASB 107

provided firms with the alternative option.[15] These eight firms were therefore removed from the initial sample to avoid any potential bias in the results. Finally, seventeen firms were excluded due to missing data. From these seventeen, five firms were removed which historically had never reported direct cash flows due to their accounts being prepared according to conventions other than Australian GAAP or the Australian equivalents to IFRS. Moreover, one large conglomerate, Wesfarmers Limited, was removed, as they could not be allocated to any specific industry classification. Eleven remaining firms were excluded either due to missing market values, or due to missing financial information for key variables.

Figure 4-1 illustrates that, on average, the final sample of 459 firms shown in Table 4-1, Panel A, represents one third of market capitalisation of all firms listed on the ASX, and half those listed on the ASX300 throughout the sample period. Moreover, Figure 4-1 demonstrates the representative nature of the sample by reporting similar trends between the market capitalisation of the sample and all firms on the ASX300 and ASXALL share indices. This specifically includes mining and natural resources exploration companies. However, in line with Clinch *et al.* (2002) mining and natural resources exploration companies are separated and treated as a unique group of 'extractive' firms, whilst all remaining firms are classified as a further sample of 'industrial' firms. All financial data is obtained from the Aspect Huntley database, which provides a detailed breakdown of the direct cash flow components that are otherwise unavailable elsewhere.

[15] Australian firms were first permitted a choice between reporting their operating cash flows using the direct or indirect method when in April 2007 the AASB amended AASB 107 by issuing AASB Amendment Pronouncement (AP) 2007-4 thereby allowing firms with the alternative option. The main purpose of issuing AASB 2007-4 was to include all options available under IFRS in the Australian equivalents to IFRS in order to eliminate the remaining differences between the different standards.

Table 4-1 Sample selection and distribution

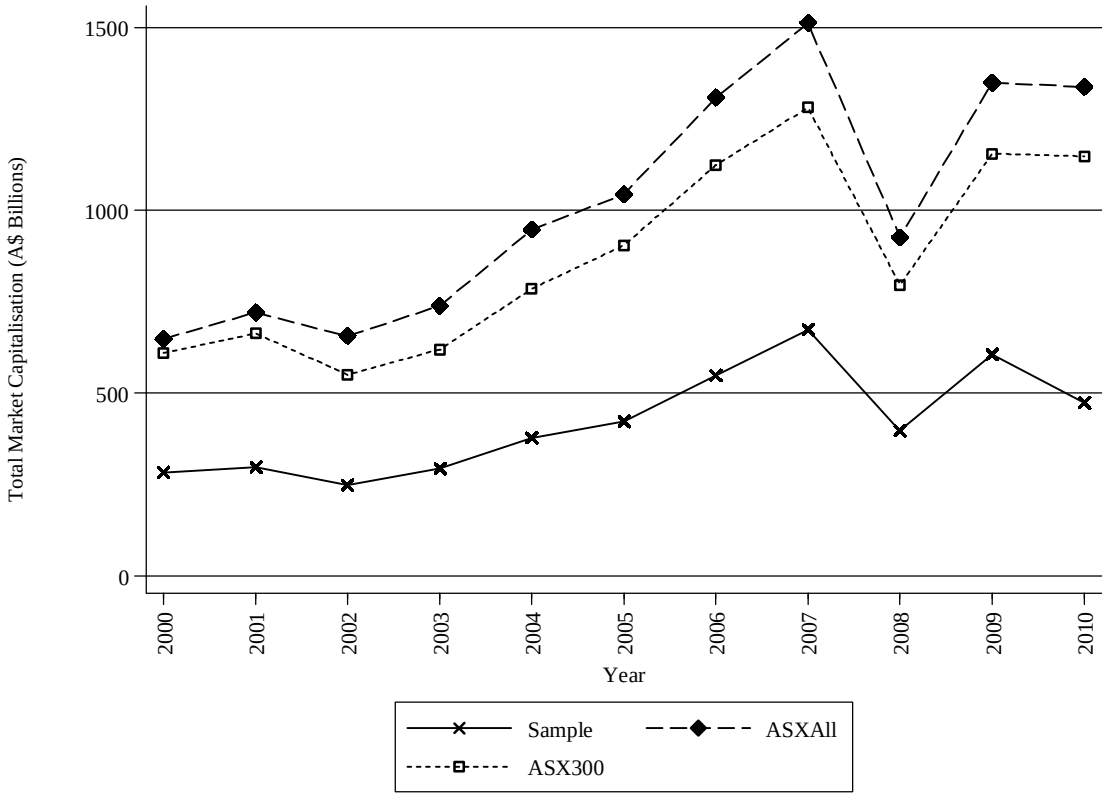
Panel A: Sampling process

	Total Firms
Initial sample of firms identified on the respective index for fiscal years from 2000 to 2010	652
Less: Foreign with a primary listing other than the ASX	(17)
Less: Financial firms	(137)
Less: Utility firms	(14)
Less: Firms switching to the indirect method of reporting cash flows	(8)
Less: Firms with missing data requirements	(17)
Final sample	459

Panel B: Sample distribution by industry sector and fiscal year

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Firm Years	Total Firms
Basic materials	9	7	8	9	9	9	10	10	8	7	6	92	11
Consumer goods and services	70	71	71	69	75	73	75	72	65	60	60	761	102
Extractive	83	85	90	92	108	118	136	138	125	123	113	1,211	171
Healthcare	26	31	30	31	31	31	31	28	26	19	15	299	37
Industrials	59	60	57	61	60	60	61	58	57	57	54	644	82
Technology	34	33	31	25	25	23	26	24	19	18	20	278	41
Telecommunications	10	11	10	8	7	7	8	9	9	9	8	96	15
Total	291	298	297	295	315	321	347	339	309	293	276	3,381	459

Figure 4-1 Comparison of total market capitalisation

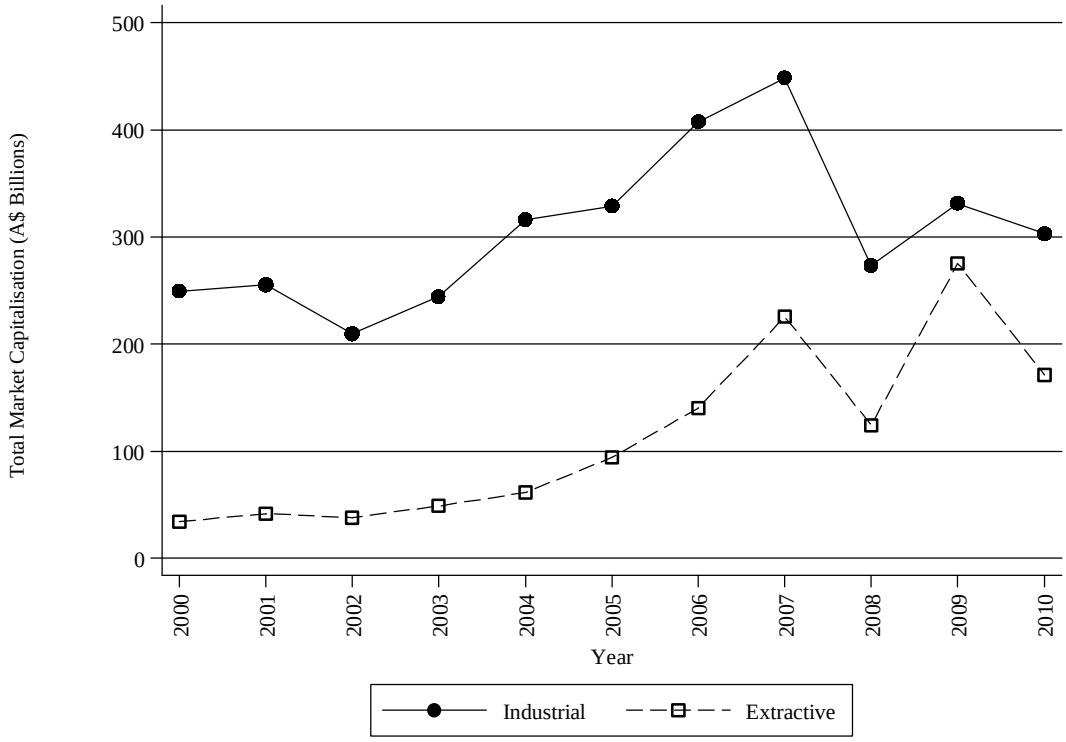


The figure presents a comparison between the total annual market capitalisation of the sample of 459 firms used in this thesis, all the firms included on the ASX300, and all the firms included on the ASXAll share index between 31 December 2000 and 31 December 2010.

Table 4-1, Panel B, presents the sample distribution by industry classification and firm-year. It shows that the number of extractive firms has grown considerably over the sample period from 83 in 2000 to 113 in 2010. This is further illustrated by Figure 4-2, which shows a significant growth in the total market capitalisation of extractive firms compared with industrial firms over the sample period. In December 2000, the total market capitalisation of extractive firms was 20% of industrial firms', and was 60% by December 2010. Distribution across other industry groups in Table 4-1, Panel B, remains relatively stable over the sample period, with the exception of the Healthcare and Technology industry, which declined over the sample period. Although the group of

industrial firms is not dominated by a single sector, the combination of Consumer goods and services and Industrials comprise 64% of firms in this sample.

Figure 4-2 Comparison of total market capitalisation for industrial and extractive firms



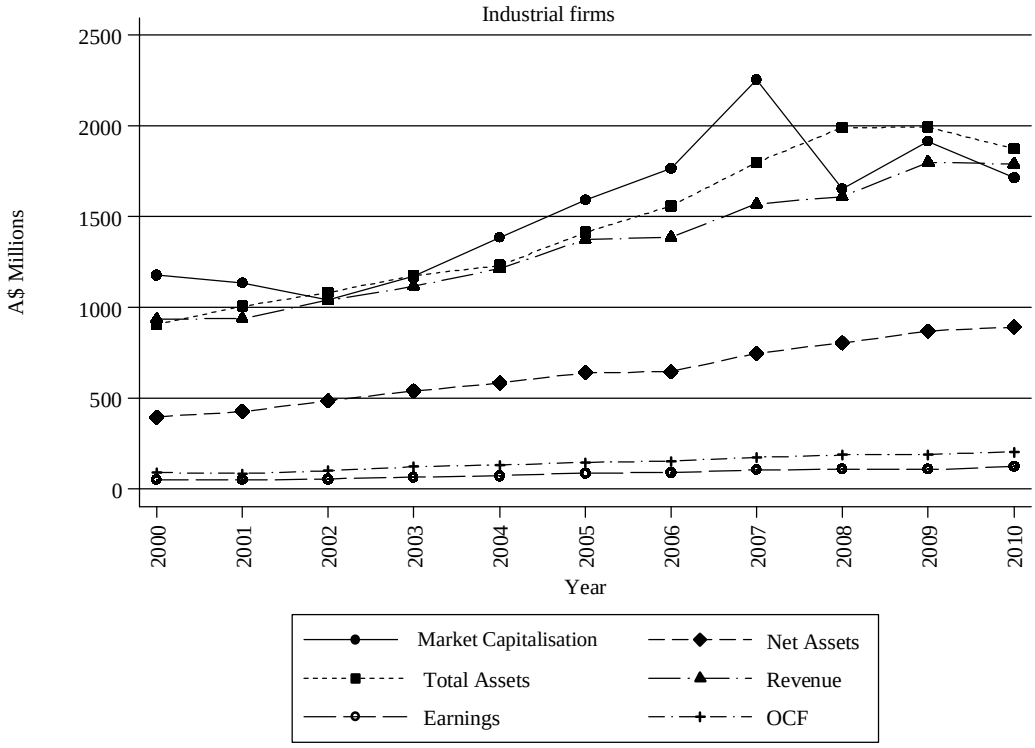
The figure presents a comparison between the total annual market capitalisation of the sample of 288 industrial firms and 171 extractive firms used in this thesis between 31 December 2000 and 31 December 2010.

4.2 Descriptive Statistics

Since chapter five to seven tabulate and discuss detailed descriptive statistics for their respective samples, this section presents only a high-level overview of the sample of 288 industrial and 171 extractive firms from 2000 to 2010. Using the raw, annually reported, figures, eight graphs illustrate the relationships, over the sample period,

between the average values of selected variables for both industrial and extractive firms.[16]

Figure 4-3 Comparison between average market capitalisation and accounting variables for industrial firms



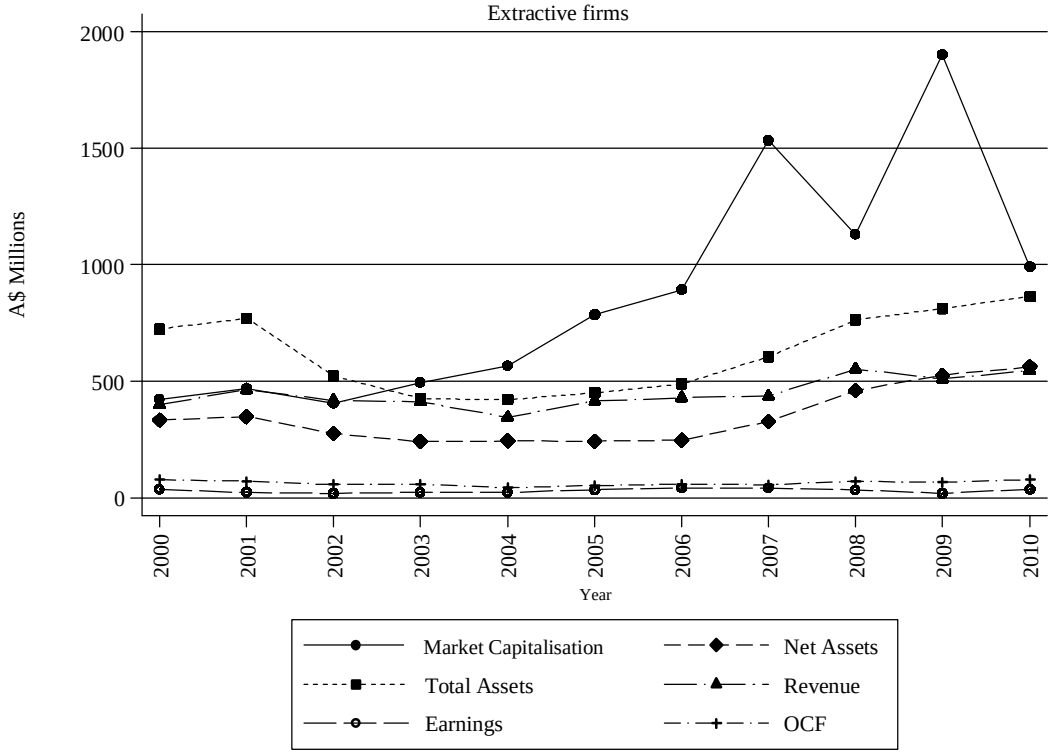
The figure presents a comparison between the average of the annual market capitalisation three months after the financial year-end, total assets, earnings, net asset, revenue, and operating cash flows (OCF) for the sample of 288 industrial firms used in this thesis between January 2000 and December 2010.

Figure 4-3 and Figure 4-4 present a comparison between the average of the annual market capitalisation three months after the financial year-end, total assets, earnings, net assets, revenue, and operating cash flows (OCF) for the samples of industrial and extractive firms respectively. Corresponding with the global fall in stock prices in 2008, there is a noticeable peak in average market value in 2007, followed by a sharp fall in

[16] Only mean values are presented since using median, rather than mean values, does not materially alter the relationships illustrated by, and ensuing discussion from, these graphs.

2008, for both industrial and extractive firms. Prior to the 2008 market collapse, the average industrial firm was valued at around A$2.3 billion, falling by 26% to A$1.7 billion within the space of 12 months. Comparatively, the average extractive firm was valued at A$1.5 billion in 2007, and also dropped by 26% to a value of A$1.1 billion in 2008. Both graphs then show a subsequent rise and fall in average market values for 2009 and 2010 respectively.

Figure 4-4 Comparison between average market capitalisation and accounting variables for extractive firms



The figure presents a comparison between the average of the annual market capitalisation three months after the financial year-end, total assets, earnings, net asset, revenue, and operating cash flows (OCF) for the sample of 171 extractive firms used in this thesis between January 2000 and December 2010.

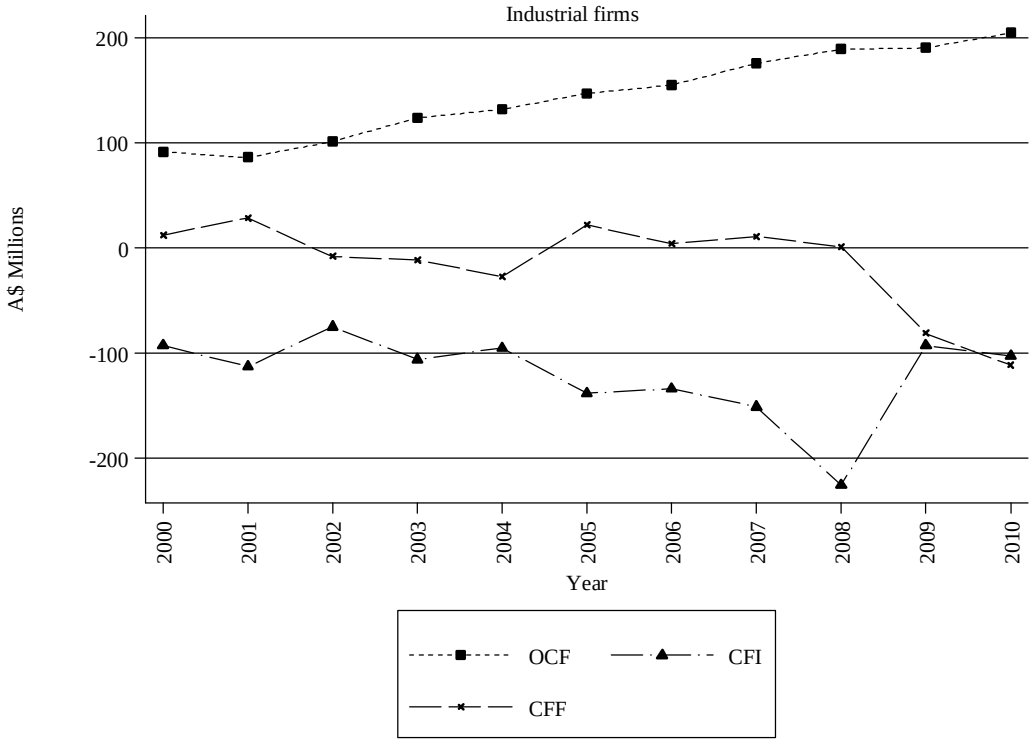
While these charts demonstrate volatile market values between 2007 and 2010, the average annual accounting values are far more stable throughout the sample period. Figure 4-3 show a steady growth in balance sheet value for industrial firms between 2000 and 2010. Average total assets more than doubled from A$900 million in 2000 to A$1.9 billion by 2010, and average net assets also doubled from A$400 million to A$900 million over the sample period. Average total revenue, earnings and operating cash flows also show growth across the sample period for industrial firms, contributing to the overall rise in average net assets.

In comparison to industrial firms, Figure 4-4 shows that average total assets and net asset values for extractive firms fall after 2001, remain relatively constant between 2003 and 2005, but grow significantly from 2006 onwards. Unlike industrial firms, however, average earnings, revenue, and operating cash flows are relatively constant between 2006 and 2010 for extractive firms', suggesting that the growth in average net assets was driven by factors other than internal resources. Given the huge increase in commodity prices over the same period, one explanation for this growth could be that firms were receiving rising levels of equity finance from outside investors.

Providing a further overview of the two samples, Figure 4-5 and Figure 4-6 compare the average annual values for operating, investing, and financing cash flows as reported in the cash flow statements for industrial and extractive firms. These graphs complement Figure 4-3 and Figure 4-4 as they provide additional insight into the causes of the observed changes in net assets for both samples. Compared with the previous charts, Figure 4-5 uses a smaller scale to better illustrate the growth in operating cash flows for industrial firms over the sample period. Rising operating cash inflows, with consistently low financing cash flows, but increasing cash outflows for

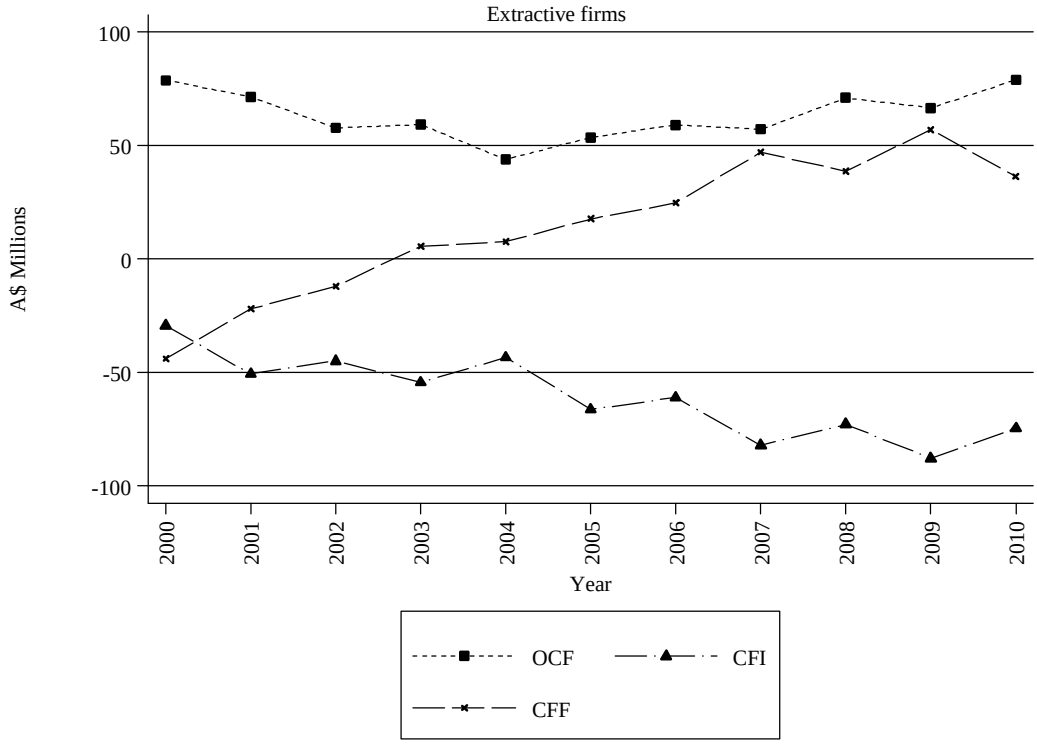
investing activities in Figure 4-5, further supports the view that the growth in industrial firms' net asset came from internal, rather than external, sources. In contrast, Figure 4-6 demonstrates a much higher reliance on external financing by extractive firms throughout the sample period. While operating cash flows remain relatively constant, financing cash inflows and investing cash outflows show steady growth between 2000 and 2010.

Figure 4-5 Comparison between average operating, investing, and financing cash flows for industrial firms



The figure presents a comparison between the average annual operating cash flows (OCF), financing cash flows (CFF), and investing cash flows (CFI), for the sample of 288 industrial firms used in this thesis between January 2000 and December 2010.

Figure 4-6 Comparison between average operating, investing, and financing cash flows for extractive firms

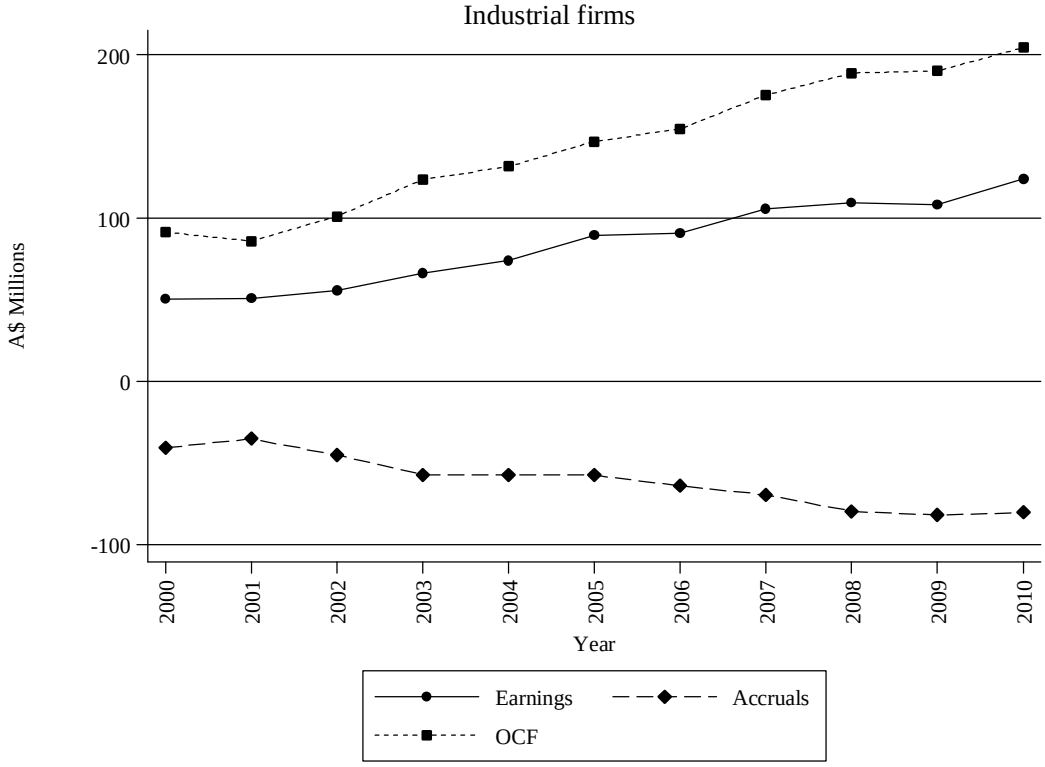


The figure presents a comparison between the average annual earnings, accruals, operating cash flows (OCF), financing cash flows (CFF), and investing cash flows (CFI), for the sample of 171 extractive firms used in this thesis between January 2000 and December 2010.

Figure 4-3 to 4-6 have illustrated the relationships between accounting values from the balance sheet, income statement, and cash flow statement, demonstrating factors that have contributed to the growth in net assets over the sample period. Further, examining the relationships between income statement and cash flow values, Figure 4-7 and Figure 4-8 compare operating cash flows, earnings, and accruals for industrial and extractive firms respectively. Accruals are calculated as the difference between earnings and operating cash flows and, therefore, all three values will be correlated with one

another, as shown by the related movements in earnings, OCF, and accruals in Figure 4-7 and Figure 4-8 across the sample period.

Figure 4-7 Comparison between average earnings, accruals, and operating cash flows for industrial firms

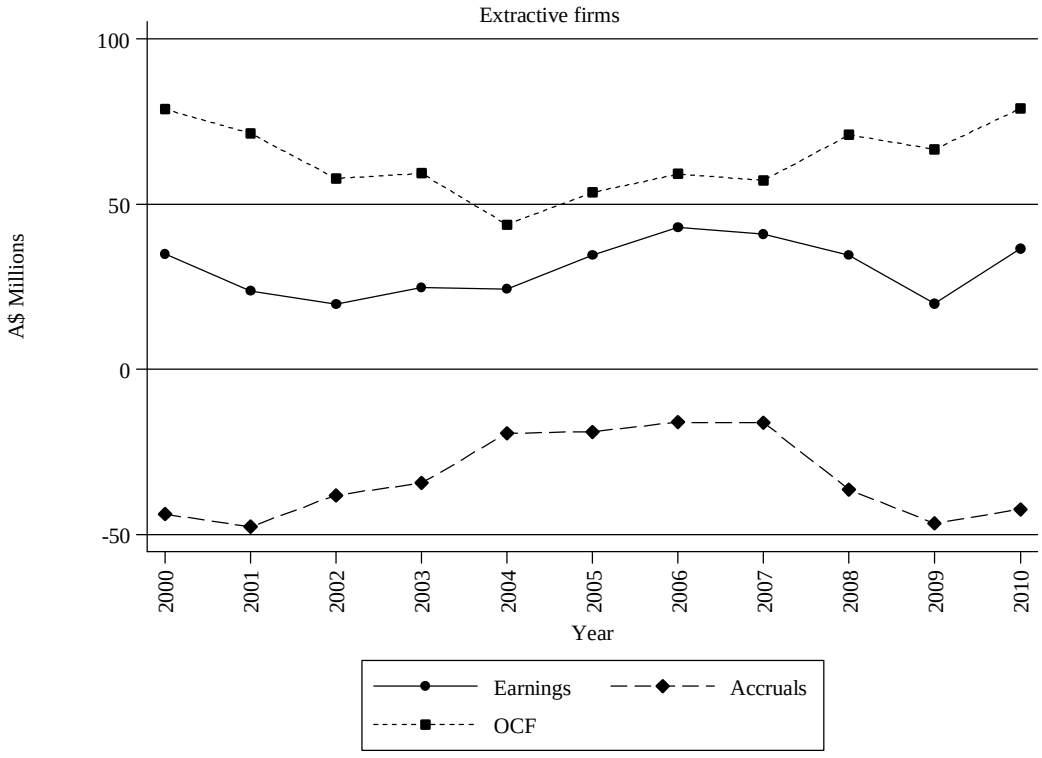


The figure presents a comparison between the average earnings, accruals, and operating cash flows (OCF), for the sample of 288 industrial firms used in this thesis between January 2000 and December 2010.

These graphs illustrate the useful information provided by disaggregating earnings into operating cash flows and accruals. For example, Figure 4-7 shows that the growth in average earnings across the sample period for industrial firms, is largely a result of a corresponding growth in operating cash flows, implying a real growth in business operations. Moreover, income-decreasing accruals in Figure 4-7 grow noticeably across the sample period, possibly due to increased depreciation on the rising investment in

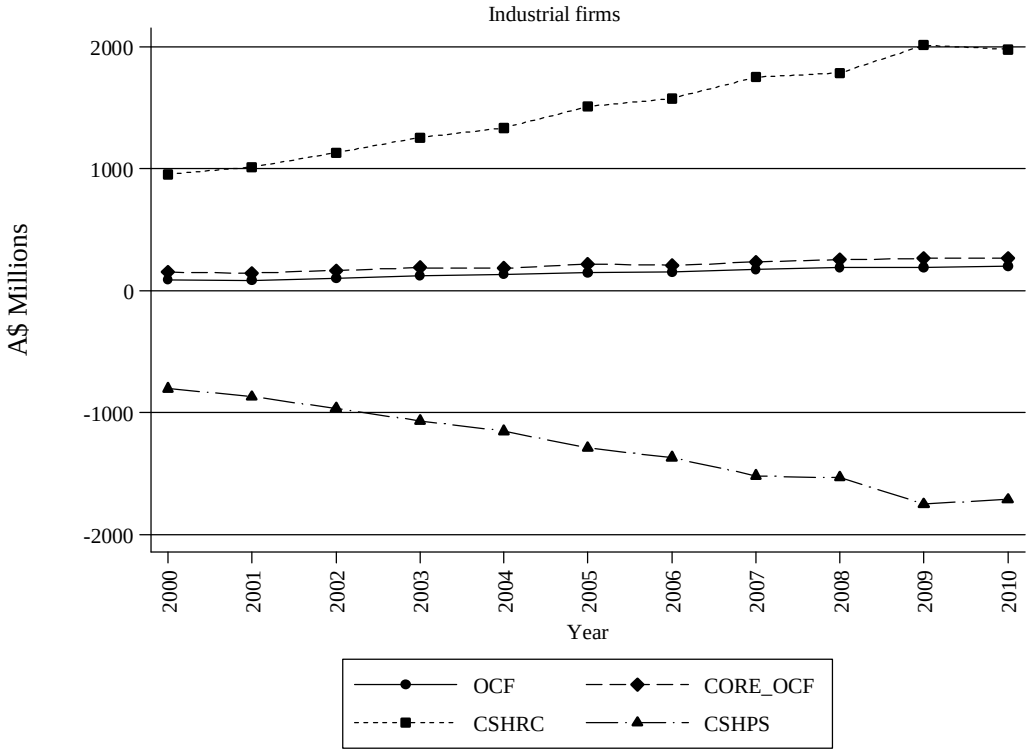
assets observed in Figure 4-5. On the other hand, disaggregating earnings for extractive firms shows a growth in earnings until 2007 caused by a successive reduction in income-reducing accruals coupled with increasing operating cash flows. Subsequent to 2007, however, earnings noticeably drop while operating cash flows continue to rise, due to a sharp rise in income-decreasing accruals. These relationships are not seen so easily without disaggregating earnings, and provide a far richer information set. It follows, therefore, that disaggregating operating cash flows into components could also provide a far richer information set than merely illustrating the movement in aggregate operating cash flows alone.

Figure 4-8 Comparison between average earnings, accruals, and operating cash flows for extractive firms



The figure presents a comparison between the average earnings, accruals, and operating cash flows (OCF), for the sample of 171 extractive firms used in this thesis between January 2000 and December 2010.

Figure 4-9 Comparison between average cash flow variables for industrial firms

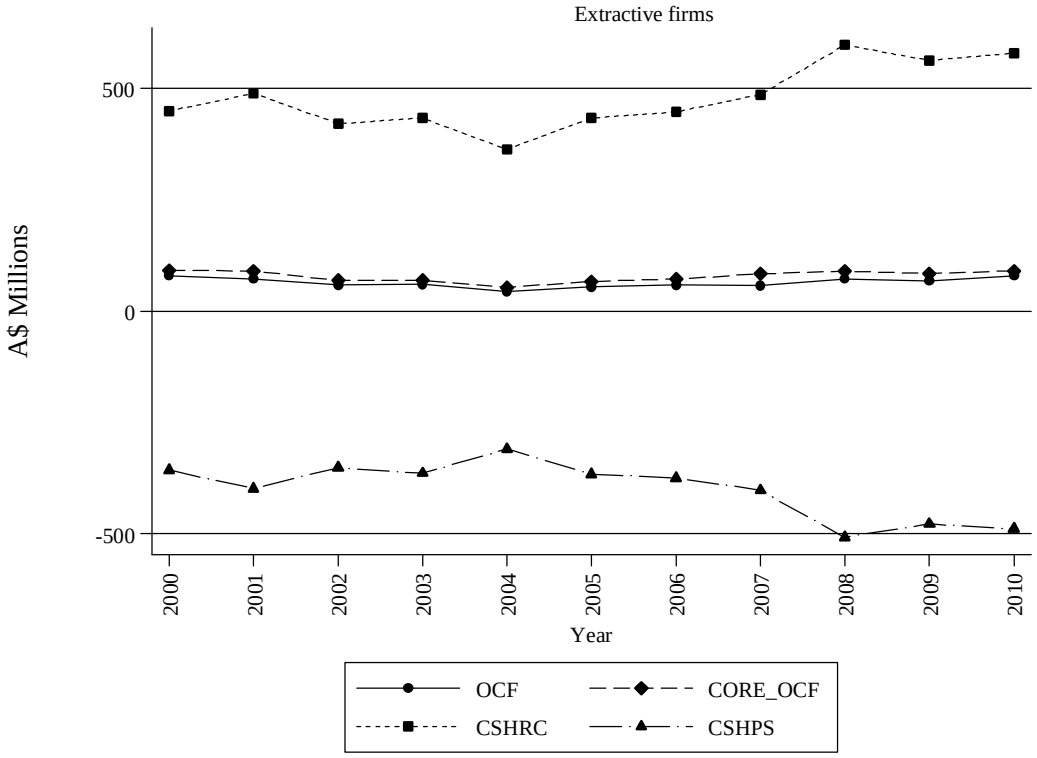


The figure presents a comparison between the average annual operating cash flows (OCF), core direct cash flows (CORE_OCF), cash receipts from customers (CSHRC), and cash payments to suppliers and employees (CSHPS) for the sample of 288 industrial firms used in this thesis between January 2000 and December 2010.

Figure 4-9 and Figure 4-10, illustrate the movement in and relationship between average OCF, cash receipts from customers (CSHRC), cash payments to suppliers and employees (CSHPS), and core direct cash flows (CORE_OCF), measured as the net of CSHRC and CSHPS. Both these graphs show an expected high level of correlation between CSHRC and CSHPS, and while CSHRC and CSHPS increase significantly over the sample period for industrial firms, they remain comparatively stable for extractive firms. A comparison of OCF and CORE_OCF shows that CSHRC and CSHPS account for the bulk of all direct cash flows, illustrating the economic significance of the information provided by these values. The following three chapters

in this thesis, therefore, aim to examine empirically the usefulness of direct cash flow information, with specific attention given to core direct cash flows and its component parts.

Figure 4-10 Comparison between average cash flow variables for extractive firms



The figure presents a comparison between the average annual operating cash flows (OCF), core direct cash flows (CORE_OCF), cash receipts from customers (CSHRC), and cash payments to suppliers and employees (CSHPS) for the sample of 171 extractive firms used in this thesis between January 2000 and December 2010.

5
The Value Relevance of Direct Cash Flows under IFRS

5.1 Introduction

The International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) are currently proposing that direct cash flow statements become mandatory for all firms under their harmonised cash flow reporting requirements.[17] Prior research has shown that direct cash flow statements provide useful information to users of financial accounts under local Generally Accepted Accounting Principles (e.g., Jones *et al.*, 1995; Clinch *et al.*, 2002; Goyal, 2004). While there is strong evidence for the usefulness of direct cash flow statements, to date, no research has examined whether this relationship still exists under International Financial Reporting Standards (IFRS). This chapter therefore, investigates the value relevance of direct cash flow statements under IFRS in Australia and assesses whether there has been a change in their value relevance since IFRS adoption.

For over 30 years, academics have strongly advocated the use of direct cash flow statements. It is interesting to note that the promotion of this method has been driven by a wide range of economic factors, such as liquidity problems (Ketz and Largay III, 1987), inflation and recession (Thomas, 1982), helping to provide clarity around

[17] See the Proposed Accounting Standards Update FASB Staff Draft of an Exposure Draft on Financial Statement Presentation published in July 2010 (paragraph 177).

insolvency (Trout *et al.*, 1993).[18] Throughout these times of uncertainty, direct cash flow disclosures have been advocated to provide useful information to users of accounts. The presentation of a direct cash flow statement allowed users of accounts to better assess the position of the firm, despite the various economic circumstances in which company financials were being reported.

In addition to the academic evidence on the usefulness of direct cash flow statements, there seems to be considerable support from users of accounts. The current IASB/FASB convergence project, if adopted, would mandate that all firms use the direct method coupled with an indirect reconciliation as part of the financial statement notes. This proposal received strong support in the 2009 Chartered Financial Analysis (CFA) Institute Member Poll: Cash Flow Survey. The results indicate that of the 541 respondents, 63% either 'agree' or 'strongly agree' that the information provided in a direct cash flow statement would help improve cash flow forecasts. Further, 94% voted that information regarding cash receipts from customers, which is only found in direct cash flow statements, was the most important information reported under operating cash flows.[19]

Given the evidence on the usefulness of direct cash flow statements, and the demand for the direct method from standard setters, academics and practitioners, it is important to understand whether direct cash flow statements provide relevant information in an IFRS reporting environment. There is a growing body of evidence that suggests countries who have adopted IFRS experienced an overall increase in financial reporting

[18] Trout *et al.* (1993) note how in 1987 the management of Chicago Central & Pacific Railroad Company were able to withdraw their Chapter 11 bankruptcy filing , after presenting direct cash flow statements to their bankers, which accurately identified the variances within the firm's cash flow budget thereby allowing the company to secure a much needed credit facility.

[19] It is worth noting that some preparers of accounts are opposed to the mandating of the direct method as a result of the additional disclosure costs firms would have to incur (Hales and Orpurt, 2012).

quality, comparability, and general usefulness in the accounting information presented to investors (Daske and Gebhardt, 2006; Barth *et al.*, 2008). Therefore, if IFRS has improved the financial reporting environment, it may be the case that direct cash flow disclosures are less relevant, as a result of the better information set provided by accounts prepared under IFRS. Consequently, the need for mandated direct cash flow statements becomes less clear given the implied cost of disclosure. However, the move to IFRS is likely to result in a large amount of uncertainty around any accounting numbers that are produced in the first few years of IFRS adoption, as investors will require time to adjust to the new accounting regime.[20] Bissessur and Hodgson (2011) for example show that post-IFRS, stock market synchronicity initially fell before increasing significantly. However, they caveat their results, as IFRS may not have unequivocally increased financial reporting quality in Australia, noting that an increased reliance on industry level information may explain their results. Direct cash flow statements may therefore become more relevant under IFRS, as historically, operating cash flows have provided investors with a stable source of information during times of uncertainty (Thomas, 1982).

Using a sample of non-financial companies listed on the ASX 300 from 2000-2010 this chapter examines whether there has been a change in the value relevance of direct cash flow statements under IFRS relative to AGAAP. Australia provides an ideal research environment to test this question, as Australia was one of the few countries to mandate direct cash flow statements under local GAAP, and most firms still follow this approach under IFRS, despite Australia allowing firms to choose between the direct and

[20] Prior to the adoption of IFRS, Ernst and Young (2005) anticipated that remaining differences between AGAAP and IFRS would lead to an overall 6% increase in profits and a 15% decrease in net assets under IFRS because of the changes brought about by the new standards.

the indirect method since 2008.[21] In addition, early adoption was prohibited and so IFRS reporting only came into effect for financial years beginning on or after 1 January 2005. This distinct break point in the reporting environment, therefore, will allow for a test of the value relevance of direct cash flow statements under IFRS. The results show that there has been a significant increase in the value relevance of both headline operating cash flow and in direct cash flow components for industrial firms. The findings suggest therefore, that direct cash flow statements have increased in value relevance under IFRS compared with AGAAP, and therefore remain a useful source of information to users of financial accounts.

5.2 Literature Review

5.2.1 Usefulness of Reporting Direct Cash Flows

Debating the disclosure of operating cash flows has been central in the development of all cash flow reporting standards over the past three decades. At the heart of this debate has been whether to allow firms the choice of reporting operating cash flows either under the indirect or direct method. Even before cash flow disclosures were standardised, academics had begun to express their preference for the direct approach (e.g., Paton, 1963; Heath, 1978; Lee, 1981; Thomas, 1982; Ketz and Largay III, 1987). Moreover, after cash flow disclosure requirements became common in accounting regimes around world, U.S. and Australian surveys conducted on diverse groups of accounting and finance academics and professionals all indicate continuing support for the direct approach (e.g., Jones *et al.*, 1995; McEnroe, 1996; Smith and Freeman, 1996; Jones and Ratnatunga, 1997; Jones and Widjaja, 1998; Goyal, 2004).

[21] See Bradbury (2011) for further discussion.

Although the IASB and FASB are advocating mandating direct method cash flow statements, few countries have previously done so,[22] and critics of mandating the direct method question whether the theoretical reporting benefits, outweigh the cost of changing accounting systems to capture the required information.[23] There is, however, a small but growing body of evidence that shows the inclusion of estimated or actual direct cash flow statements components increase the explanatory power and accuracy of cash flow and earnings prediction models (e.g., Krishnan and Largay III, 2000; Arthur and Chuang, 2008; Cheng and Hollie, 2008; Orpurt and Zang, 2009; Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). Moreover, there is also strong evidence for the value relevance of direct cash flows (e.g., Livnat and Zarowin, 1990; Clinch *et al.*, 2002; Orpurt and Zang, 2009).

Livnat and Zarowin (1990) examine the value relevance of estimated direct cash flow components and find a significant relationship between unexpected changes in estimated direct cash flows and annual abnormal stock returns. Moreover, Clinch *et al.* (2002), using actual direct cash flow statements for a sample of Australian firms, show that direct cash flow components are value relevant and have a direct correlation in forecasting future cash flows and annual stock returns. In addition, Orpurt and Zang (2009) find that U.S. firms that voluntarily report direct cash flows have a higher correlation between their stock prices and future earnings than firms using the indirect method.

[22] Australia, New Zealand and China were the only nations that have ever mandated the use of the direct approach (Wallace *et al.*, 1997; Clinch *et al.*, 2002).
[23] See the comment letters from the *FASB Preliminary Views on Financial Statement Presentation Reference Number: 1630-100* published in 2009.

5.2.2 Impact of Reporting Under IFRS

Investigating the impact of early adoption of IFRS, Barth *et al.* (2008) and Daske and Gebhardt (2006) both find a significant improvement in financial reporting quality of those firms that switched from local GAAP to IFRS. Notably, Barth *et al.* (2008) found increased value relevance of earnings under IFRS, whilst Daske and Gebhardt (2006) observed that users perceived IFRS financial statements to be of significantly higher quality than those prepared under local GAAP. Although these early studies provide some evidence for increased financial reporting quality, it was only after the 2005 mandatory adoption of IFRS by the E.U. and Australia that the impact of reporting under IFRS could be further examined by using far larger and richer data sets.

Daske *et al.* (2008) provides evidence on the economic benefits of IFRS adoption, with a general decline in cost of capital and an increase in Tobin's Q in the pre-adoption year, followed by an increase in capital market liquidity post-adoption. However, increased market liquidity under IFRS only occurred in countries with strong reporting incentives and legal enforcement of the standards. This result is consistent with the views of Ball (2006) and Soderstrom and Sun (2007), who postulated that the perceived benefits associated with the global mandatory adoption of IFRS, would be dependent upon the effectiveness of the enforcement of IFRS. Byard *et al.*'s (2011) findings further emphasise the important role of effective enforcement, as their results show a significant decline in analyst forecast errors following the mandatory adoption of IFRS in Europe, but only for firms in countries with a strong legal environment.

5.2.3 Adoption of IFRS by Australia

Australia provides an ideal setting in which to examine the impact of reporting under IFRS since there is a regime of high quality accounting enforcement coupled with low manipulation incentives (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012). Moreover, unlike the E.U., Australia prohibited the early adoption of IFRS. Consequently, any empirical results on the impact of IFRS adoption are free from early adoption bias. The Australian government had been on a process of IFRS convergence since 1996 (Tarca, 2004). However, by the time firms adopted the Australian equivalents of IFRS there were still noteworthy differences between the two standards.[24] If these differences were not significant then the mandatory adoption of IFRS would have caused very little or no change at all in the value relevance of accounting information (Aharony *et al.*, 2010). In fact recent studies specifically examining Australian firms have found that there has been a significant change in the value relevance of accounting information subsequent to adopting IFRS, evidenced by an increased accuracy of analysts' earnings forecasts (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012), and an increased level of stock market synchronicity (Bissessur and Hodgson, 2011).

5.3 Hypotheses Development

Cotter *et al.* (2012) and Bissessur and Hodgson (2011) both attribute their findings to a post-IFRS improvement in accounting information. However, an important question

[24] Some of the more significant differences between Australian GAAP and IFRS include IFRS prohibiting the disclosure of extraordinary items; disallowing the use of the full liability method of accounting for deferred taxation; prohibiting the recognition of certain non-goodwill related internally generated intangible assets; accounting for changes in the fair value of investment properties through the income statement rather than the statement of changes in equity; providing far more comprehensive requirements and guidance for the recognition and disclosure of financial instruments; requiring the recognition and disclosure of all share based payments irrespective of whether they were applicable to directors, executives or all staff. (*Deloitte, Differences between current Australian GAAP and Australian equivalents to IFRS*, published in August 2004).

that extant literature has generally left unanswered, is what specific accounting information under IFRS has improved the quality of accounting information and resulted in an overall improvement in earnings forecasts. Prior to the adoption of IFRS, Ernst and Young (2005) anticipated that the remaining differences between AGAAP and IFRS would lead to an overall 6% increase in profits, and a 15% decrease in net assets because of the changes brought about by the new standards. The most significant change under IFRS was the abolition of capitalising certain internally generated intangible assets, and the introduction of assessing goodwill for annual impairment, rather than amortising goodwill. Prior to IFRS, Matolcsy and Wyatt (2006) found a significant positive/(negative) association between firms which capitalised intangible assets and analyst following/(forecast errors). Further, subsequent to Australia's adoption of IFRS, Chalmers *et al.* (2010) present evidence of significantly higher analyst forecast errors for firms reporting lower levels of internally generated capitalised intangible assets. Taken together, these findings imply that the IASB's changes to intangibles in Australia may have resulted in a loss of value relevant information.

IFRS is also thought to increase earnings volatility because of the application of fair value accounting. Although Ball (2006) notes that increased earnings volatility is not necessarily a problem, it becomes a problem when it is caused by '*estimation noise*' or '*management manipulation*'. Earnings volatility may therefore be an issue under IFRS given the increased reliance on managerial discretion that fair value measurement requires. Moreover, as Ball (2006) notes, the recognition of both future gains and losses in the current reporting period is one of the most significant problems associated with

fair value accounting, and this approach is contrary to the conservative accounting approach of deferring expected future profits until realised.

Although IFRS was adopted in 2005, there were no major differences in cash flow reporting between AASB 1026, and the IFRS equivalent to IAS 7, AASB 107 *Statement of Cash flows*. Australian cash flow disclosure requirements have therefore remained consistent under both AGAAP and IFRS, while the reporting of net assets and earnings has changed. Cash flow reporting requirements were originally issued in order to provide additional information amid times of growing financial instability, when information from the balance sheet and income statement alone were not sufficient to provide information to users of accounts (Thomas, 1982). As a result, if the changes brought about by IFRS adoption, leads to increased uncertainty around the accounting numbers produced under IFRS in the short run, then cash flow information, which is reported consistently under AGAAP and IFRS, should increase in value relevance. The first hypothesis is therefore,

H1: Value relevance of operating cash flows increases under IFRS

In addition, since AASB 107 mandated that all firms use the direct method of reporting cash flows until 2007, operating cash flows are then disaggregated to examine the value relevance of direct cash flow components under IFRS. Further, both ‘core’ and ‘non-core’ direct cash flow disclosures are then analysed, given the perceived benefits of direct cash flow statements as a source of useful information for users of accounts, and the belief by analysts that components such as cash receipts from customers are useful informational disclosures. Prior research has shown that ‘core’ direct cash flows have been found to be more useful in forecasting future cash flows

than either 'non-core' or aggregate operating cash flows alone (Cheng and Hollie, 2008).[25]

In a 2009 CFA survey, the majority of respondents agreed that information provided by direct cash flow statements would improve their cash flow forecasts. Specifically, of those who responded, the direct cash flow component of 'cash receipts from customers' was considered to be the most important information within the operating section of a direct cash flow statement. Prior research has shown an increase in power and accuracy of cash flow and earnings prediction models after including direct cash flow components (e.g., Krishnan and Largay III, 2000; Arthur and Chuang, 2008; Cheng and Hollie, 2008; Orpurt and Zang, 2009; Arthur *et al.*, 2010). Further, studies also provide strong evidence of the value relevance of direct cash flows (e.g., Livnat and Zarowin, 1990; Clinch *et al.*, 2002; Orpurt and Zang, 2009). Accordingly, a rise in the value relevance of 'core' direct cash flows and direct cash flow components under IFRS is predicted. The second hypothesis is therefore,

H2: The value relevance of core direct cash flows and direct cash flow components increases under IFRS

5.4 Model Development and Data

5.4.1 Model Construction

Price levels models are often used to provide standard setters with insights into the value relevance of specific accounting information (Barth *et al.*, 2001a). To examine the

[25] 'Core' direct cash flows are calculated as the net amount of cash receipts from customers and cash payments to suppliers and employees. 'Non-core' direct cash flows include all other operating cash flows. Cheng and Hollie (2008) find that 'core' cash flows showed a higher level of persistence into future cash flows than 'non-core' cash flows. Moreover, this model revealed a higher explanatory power when compared with the more parsimonious model using aggregate operating cash flows.

value relevance of operating cash flows and the direct cash flow components pre and post-IFRS, therefore, the coefficients generated by the price levels Equations (5.1) to (5.5) below are compared before and after 1 January 2005.[26] Pooling the regressions for the entire sample period and including dummy variables interacting between the explanatory variables and the post-IFRS adoption period, will determine whether there has been a significant change in the value relevance of operating cash flows and direct cash flow components after the adoption of IFRS.[27] These models are derivations of the Ohlson model (Feltham and Ohlson, 1995; Ohlson, 1995), and are estimated using pooled cross-sectional regressions in which all the variables have been deflated by the number of common shares outstanding in order to mitigate the effects of heteroskedasticity (Barth and Clinch, 2009).

Of the few studies examining the usefulness of direct cash flows in Australia, Clinch *et al.* (2002) specifically treat mining firms separately in their analysis whilst Arthur *et al.* (2010) specifically exclude such firms. For this chapter, extractive firms are included for analysis, but treated as a separate industry group following Clinch *et al.* (2002) due to the fact that mining companies are characterised by long periods of cash outflow with little or no cash inflow. Accordingly, all the models are estimated using the two distinct groups of industrial and extractive firms. Following Barth and Clinch (1998) the first equation investigates the value relevance of net assets and earnings:

$$PRICE_{it} = \alpha + \beta_1 NETASS_{it} + \beta_2 EARN_{it} + \varepsilon_{it} \quad (5.1)$$

[26] Australia adopted IFRS in 2005, effective for all financial years beginning on or after 1 January 2005. Although the first published annual reports under IFRS would be for financial years ending on or after 31 December 2005, Australian companies were obliged to report on the impact of adopting IFRS as part of their accounts for the 2005 fiscal year. Accordingly, all fiscal year ends after 1 January 2005 are considered to be under IFRS.

[27] Wald tests are also used to test the pre and post-IFRS difference in value relevance and the results are qualitatively similar to those reported using the interactive dummy variable approach employed in this chapter.

Where, $PRICE_{it}$ is the closing unadjusted share price three months after the financial year-end. $NETASS_{it}$ is the reported net asset at the financial year-end, and $EARN_{it}$ is earnings after taxation but before accounting for any extraordinary items. Equation (5.1) is therefore the 'benchmark model' as the variable for earnings $EARN_{it}$ implicitly includes both operating cash flows and accruals at all possible levels of aggregation or disaggregation. The earnings variable is essentially identical to Clinch *et al.*'s (2002) 'operating income' variable which is calculated as the aggregate of operating cash flows and indirect accruals.

With adopting IFRS, the changes to accounting for intangibles may have resulted in a loss of value relevant information (Matolcsy and Wyatt, 2006; Chalmers *et al.*, 2010), Equation (5.2) therefore disaggregates $NETASS_{it}$. Intangible assets are treated as a separate explanatory variable thereby isolating any effects arising from the IASB's new accounting requirements for intangibles under IFRS:

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 EARN_{it} + \varepsilon_{it} \quad (5.2)$$

Where NA_{it} is net assets excluding intangibles, calculated as $NETASS_{it}$ minus $INTASS_{it}$, and $INTASS_{it}$ is reported net intangible assets at the financial year-end.

Equation (5.3) directly examines the value relevance of operating cash following Sloan (1996) and Barth *et al.* (2001b), where earnings are disaggregated into the two major components of operating cash flows and accruals:

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 OCF_{it} + \beta_4 ACC_{it} + \varepsilon_{it} \quad (5.3)$$

Where OCF_{it} is net operating cash flow for the financial year and ACC_{it} are total accruals calculated as $EARN_{it}$ minus OCF_{it}. Equations (5.1) to (5.3) are used to test

hypothesis H1 by examining the change in the coefficients for the explanatory variables pre and post-IFRS.

Next, operating cash flows are disaggregated into 'core' and 'non-core' cash flows as prior research has found that 'core' direct cash flows are more useful in forecasting future cash flows than either 'non-core' or aggregate operating cash flows alone (Cheng and Hollie, 2008). Accordingly, Equation (5.4) follows Cheng and Hollie (2008) by disaggregating operating cash flows into net core direct cash flows and non-core operating cash flows:

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 CORE\_OCF_{it} + \beta_4 NCORE\_OCF_{it} + \beta_5 ACC_{it} + \varepsilon_{it} \quad (5.4)$$

Where $CORE\_OCF_{it}$ is net core direct cash flows calculated as the net of cash receipts from customers and cash payments to suppliers and employees, and $NCORE\_OCF_{it}$ is non-core operating cash flows calculated as OCF_{it} minus $CORE\_OCF_{it}$.

The final equation follows Krishnan and Largay III (2000), Orpurt and Zang (2009) and Arthur *et al.* (2010) by further disaggregating operating cash flows into the direct cash flow components which are reported in the direct cash flow statements:

$$\begin{aligned} PRICE_{it} &= \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 CSHRC_{it} + \beta_4 CSHPS_{it} + \beta_5 INTP_{it} + \beta_6 TXP_{it} \\ &+ \beta_7 CSHOTH_{it} + \beta_8 ACC_{it} + \varepsilon_{it} \end{aligned} \quad (5.5)$$

Where $CSHRC_{it}$ is cash receipts from customers and $CSHPS_{it}$ is cash payments to suppliers and employees. Non-core direct cash flows are disaggregated into interest paid $INTP_{it}$, net taxes paid or tax refunds received TXP_{it}, and all other operating cash flows $CSHOTH_{it}$. Equations (5.4) and (5.5) are used to address hypothesis H2.

5.4.2 Sample Construction and Descriptive Statistics

The initial sample consists of 652 firms representing companies listed on the Australian Stock Exchange (ASX) 300 index at the end of each of the ten years from 2000-2010.[28] From this list, financials and utilities firms are removed, along with firms that are not primarily listed on the ASX, and firms missing key financial information.[29] All firms that subsequently chose to report their cash flows under the indirect method are also removed.[30] Only eight firms in the sample chose to switch from the direct to the indirect method. The low uptake of the indirect method by Australian companies is likely a result of Australian firms having already invested in the information systems needed to capture the requisite information reported in a direct cash flow statement (Bond *et al.*, 2012). Accordingly, there is no added cost for Australian firms to continue reporting direct cash flows since this is effectively a sunk cost. In addition, the removal of this information may be viewed as a negative signal as the firm would be disclosing less information than previously, and so firms are not willing to switch. Consequently, if firms are disclosing direct cash flow components, they are likely to continue doing so, even when given the option to switch.

The final sample of 459 firms shown in Table 5-1, Panel A, represents, on average, one third of market capitalisation of all domestic firms listed on the ASX throughout the sample period. This specifically includes mining and natural resources exploration companies. However, in line with Clinch *et al.* (2002), mining and natural resources

[28] The ASX300 comprises the 300 largest firms in Australia.
[29] Financial firms are removed because of their different reporting requirements and utility firms are excluded given their oligopolistic status. Foreign domiciled firms are also excluded from the sample, as they do not follow Australian GAAP.
[30] Australian firms were first permitted a choice between reporting their operating cash flows using the direct or indirect method when in April 2007 the AASB amended AASB 107 by issuing AASB Amendment Pronouncement (AP) 2007-4 thereby allowing firms with the alternative option. The main purpose of issuing AASB 2007-4 was to include all options available under IFRS in the Australian equivalents to IFRS in order to eliminate the remaining differences between the different standards.

exploration companies are treated as a unique group of 'extractive' firms, whilst all remaining firms are classified as a further sample of 'industrial' firms. All financial data is obtained from the Aspect Huntley database, which provides a detailed breakdown of the direct cash flow components that are otherwise unavailable elsewhere.

Table 5-1, Panel B, presents the sample distribution by industry classification and firm-year. It reveals that the number of extractive firms has grown considerably over the sample period from 83 in 2000 to 113 in 2010. The distribution across other industry groups remains relatively stable over the sample period, with the exception of the Healthcare and Technology industry, which sees a sharp fall in numbers by the end of 2010. Although the group of industrial firms is not dominated by a single sector, Consumer goods and services and Industrials combined comprise 64% of firms in this sample.

Summary descriptive statistics reported in Table 5-1, Panel C, presents the market capitalisation, net assets, total assets, earnings, operating cash flows and revenue of the pooled sample of industrial firms and extractive firms as well as the pre and post-IFRS periods. Consistent with Clinch *et al.* (2002), this table shows that all the variables are highly positively skewed for both industrial and extractive firms. Further, the means and medians for the variables in the industrial sample are consistently larger than extractive firms. Although the means and medians for most of the variables for extractive firms are roughly half the size of industrial firms, the medians for earnings, operating cash flows and revenue of extractive firms are all less than 10% of those for industrial

firms.[31] This is most likely due to the nature of the industry, which requires a lengthy start-up period of exploration before revenue generation begins. Finally, means and medians of all variables are shown to increase noticeably after the adoption of IFRS, with the exception of median earnings, operating cash flow and revenue for extractive firms.

Table 5-2 provides summary descriptive statistics of all the variables used in the regression analysis, which are standardised by common shares outstanding at the financial year-end to mitigate any potential scale effects (Barth and Clinch, 2009). Consistent with the unscaled variables in Table 5-1, Panel C, the deflated variables in Table 5-2 Panel A are positively skewed with average share price, net assets, earnings and operating cash flows per share being larger for industrial than extractive firms. Further, the mean value per share of each variable increases in the post-IFRS period. Overall, the summary statistics in Table 5-2, Panel A are in line with those in Clinch *et al.* (2002).

[31] The comparatively smaller size of the variables for extractive firms is partly due to the exclusion of Rio Tinto and BHP Billiton, two of the largest extractive firms. These firms are excluded because of the sample selection criteria to exclude all firms reporting indirect cash flow statements during the sample period. Rio Tinto Limited and Rio Tinto Plc. merged in December 1995, subsequent to which the group reported under U.K. GAAP using the indirect method of cash flow reporting. BHP Billiton elected to report their cash flow statement using the indirect method from 2008 after the AASB provided firms with a choice between the two methods. As a result, both for these firms were dropped from the analysis.

Table 5-1 Sample selection and distribution

Panel A: Sampling process

	Total Firms
Initial sample of firms identified on the respective index for fiscal years from 2000 to 2009	652
Less: Foreign with a primary listing other than the ASX	(17)
Less: Financial firms	(137)
Less: Utility firms	(14)
Less: Firms switching to the indirect method of reporting cash flows	(8)
Less: Firms with missing data requirements	(17)
Final sample	459

Panel B: Sample distribution by industry sector and fiscal year

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Firm Years	Total Firms
Basic materials	9	7	8	9	9	9	10	10	8	7	6	92	11
Consumer goods and services	70	71	71	69	75	73	75	72	65	60	60	761	102
Extractive	83	85	90	92	108	118	136	138	125	123	113	1,211	171
Healthcare	26	31	30	31	31	31	31	28	26	19	15	299	37
Industrials	59	60	57	61	60	60	61	58	57	57	54	644	82
Technology	34	33	31	25	25	23	26	24	19	18	20	278	41
Telecommunications	10	11	10	8	7	7	8	9	9	9	8	96	15
Total	291	298	297	295	315	321	347	339	309	293	276	3,381	459

Table 5-1 (continued)

Panel C: Size of sample firms

	Full sample			Pre-IFRS			Post-IFRS		
	(2,170 firm-years)			(1,038 firm-years)			(1,132 firm-years)		
Industrial firms Variable	Mean A$ Mill	Median A$ Mill	SD A$ Mill	Mean A$ Mill	Median A$ Mill	SD A$ Mill	Mean A$ Mill	Median A$ Mill	SD A$ Mill
Market capitalisation	1,510.00	303.00	4,750.00	1,180.00	238.00	4,850.00	1,820.00	401.00	4,640.00
Net assets	629.00	142.00	1,400.00	486.00	113.00	1,260.00	759.00	184.00	1,500.00
Total assets	1,430.00	298.00	3,540.00	1,080.00	205.00	3,040.00	1,760.00	406.00	3,910.00
Earnings	82.50	16.30	322.00	59.50	11.50	304.00	104.00	22.40	336.00
Operating cash flow	142.00	23.00	618.00	107.00	15.80	516.00	175.00	31.00	697.00
Revenue	1,320.00	268.00	3,850.00	1,050.00	204.00	3,110.00	1,570.00	377.00	4,410.00
	(1,211 firm-years)			(458 firm-years)			(753 firm-years)		
Extractive firms Variable	Mean A$ Mill	Median A$ Mill	SD A$ Mill	Mean A$ Mill	Median A$ Mill	SD A$ Mill	Mean A$ Mill	Median A$ Mill	SD A$ Mill
Market capitalisation	934.00	171.00	3,740.00	476.00	72.20	1,220.00	1,210.00	257.00	4,620.00
Net assets	350.00	76.30	788.00	285.00	42.60	671.00	390.00	102.00	850.00
Total assets	622.00	124.00	1,440.00	562.00	71.10	1,370.00	659.00	148.00	1,480.00
Earnings	31.40	(0.61)	114.00	25.30	0.15	86.70	35.20	(1.22)	127.00
Operating cash flow	62.90	0.95	198.00	61.10	3.77	177.00	64.10	(0.33)	210.00
Revenue	452.00	24.40	1,780.00	405.00	27.90	1,340.00	480.00	19.80	2,000.00

The sample consists of 459 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. "Market capitalisation" is measured three months after the end of each financial year. "Earnings" are measured as earnings after taxation before extraordinary items. All other accounting variables are as reported in the annual financial statements for each firm. Using the Industry Classification Benchmark (ICB) code, all firms included in the three ICB sector codes 0530, 1750 and 1770 are classified as "extractive" firms whilst all remaining companies are included under "industrial" firms. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005.

From Table 5-2, Panel A, it can be seen that cash receipts from customers (CSHRC) and cash payments to suppliers and employees (CSHPS) represent the greatest proportion of operating cash flows and show the highest standard deviation among all the cash flow components. This suggests that the perceived importance of these amounts over and above the other cash flow components may be justified and provides some justification for their classification by Cheng and Hollie (2008) as 'core' operating cash flows. Moreover, consistent with the extant literature, the correlations reported in Table 5-2, Panel B report a high correlation between CSHRC and CSHPS suggesting that one dollar per share of cash receipts from customers explains more than ninety-eight cents per share of cash paid to suppliers and employees. Due to this high correlation, this chapter deliberately examines the net 'core' operating cash flows in a separate model to prevent the findings from being unduly influenced by this high correlation.

Table 5-2 Descriptive statistics

Panel A: Descriptive statistics of variables used in the regression analysis

	Full sample			Pre-IFRS			Post-IFRS		
Industrial firms	(2,170 firm-years)			(1,038 firm-years)			(1,132 firm-years)		
Variable	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
PRICE	4.22	2.16	7.22	3.37	1.90	4.81	5.00	2.49	8.80
NETASS	1.75	1.05	2.06	1.53	0.93	1.79	1.95	1.20	2.26
INTASS	0.94	0.25	1.66	0.64	0.17	1.25	1.21	0.37	1.92
CSHRC	4.55	1.95	6.93	3.94	1.60	6.20	5.11	2.26	7.50
CSHPS	(4.06)	(1.60)	6.42	(3.51)	(1.27)	5.76	(4.56)	(1.82)	6.94
CORE_OCF	0.49	0.25	0.99	0.43	0.21	1.00	0.55	0.29	0.97
TXP	(0.08)	(0.04)	0.13	(0.07)	(0.03)	0.10	(0.10)	(0.04)	0.15
INTP	(0.07)	(0.02)	0.11	(0.06)	(0.02)	0.09	(0.08)	(0.03)	0.13
CSHOTH	(0.02)	0.01	0.71	(0.04)	0.01	0.82	0.00	0.01	0.59
OCF	0.32	0.18	0.54	0.27	0.14	0.47	0.37	0.21	0.59
ACC	(0.12)	(0.05)	0.34	(0.11)	(0.04)	0.34	(0.12)	(0.05)	0.35
EARN	0.21	0.12	0.35	0.15	0.10	0.25	0.25	0.15	0.41
Extractive firms	(1,211 firm-years)			(458 firm-years)			(753 firm-years)		
Variable	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
PRICE	2.24	0.76	5.12	1.23	0.52	2.04	2.85	0.97	6.21
NETASS	0.84	0.34	1.33	0.77	0.28	1.12	0.88	0.38	1.44
INTASS	0.05	0.00	0.21	0.04	0.00	0.18	0.05	0.00	0.23
CSHRC	1.32	0.08	6.43	1.22	0.16	4.45	1.37	0.04	7.39
CSHPS	(1.13)	(0.07)	6.19	(1.03)	(0.10)	4.25	(1.18)	(0.06)	7.11
CORE_OCF	0.19	0.01	0.46	0.19	0.03	0.36	0.19	(0.00)	0.51
TXP	(0.03)	0.00	0.09	(0.02)	0.00	0.07	(0.03)	0.00	0.10
INTP	(0.02)	(0.00)	0.04	(0.02)	(0.00)	0.04	(0.02)	(0.00)	0.04
CSHOTH	0.00	0.00	0.15	0.00	0.00	0.05	(0.00)	0.00	0.19
OCF	0.15	0.00	0.41	0.15	0.02	0.30	0.14	(0.00)	0.47
ACC	(0.07)	(0.02)	0.25	(0.09)	(0.02)	0.17	(0.06)	(0.01)	0.28
EARN	0.07	(0.00)	0.25	0.06	0.00	0.17	0.08	(0.00)	0.28

Table 5-2 (continued)

Panel B: Industrial firms (below the diagonal) and Extractive firms (above the diagonal) Pearson correlations of variables used in the regression analysis

Variable	PRICE	NETASS	INTASS	CSHRC	CSHPS	CSHRAP	TXP	INTP	CSHOTH	OCF	ACC	EARN
PRICE		0.506	0.087	0.249	-0.225	0.465	-0.355	-0.361	-0.189	0.329	-0.099	0.449
NETASS	0.629		0.282	0.641	-0.606	0.814	-0.640	-0.630	0.042‡	0.708	-0.462	0.713
INTASS	0.413	0.667		0.193	-0.186	0.187	-0.174	-0.250	0.033‡	0.154	-0.062	0.194
CSHRC	0.540	0.669	0.375		-0.998	0.569	-0.567	-0.540	0.032‡	0.459	-0.269	0.493
CSHPS	-0.500	-0.646	-0.347	-0.992		-0.518	0.535	0.520	-0.030‡	-0.410	0.234	-0.448
CSHRAP	0.541	0.496	0.370	0.568	-0.459		-0.730	-0.562	0.049‡	0.904	-0.620	0.881
TXP	-0.740	-0.644	-0.440	-0.674	0.635	-0.598		0.375	-0.047‡	-0.561	0.282	-0.651
INTP	-0.392	-0.670	-0.489	-0.545	0.526	-0.405	0.455		0.276	-0.333	0.144	-0.410
CSHOTH	-0.026‡	0.024‡	-0.054	-0.074	-0.030‡	-0.710	0.056	-0.037‡		0.436	-0.610	0.111
OCF	0.699	0.648	0.402	0.671	-0.621	0.674	-0.688	-0.479	0.020‡		-0.832	0.828
ACC	-0.260	-0.296	-0.176	-0.402	0.366	-0.440	0.253	0.242	-0.056	-0.773		-0.377
EARN	0.822	0.707	0.446	0.638	-0.596	0.605	-0.812	-0.499	-0.025‡	0.778	-0.203	

Variable Definitions:

PRICE	= closing unadjusted share price three months after the financial year-end;	TXP	= net taxes paid or tax refunds received;
NETASS	= reported net assets at the financial year-end;	INTP	= interest paid;
INTASS	= reported net intangible assets at the financial year-end;	CSHOTH	= all other operating cash flows
CSHRC	= cash receipts from customers;	OCF	= net operating cash flow for the year;
CSHPS	= cash payments to suppliers and employees;	ACC	= accruals calculated as *EARN* minus *OCF;*
CORE_OCF	= core operating cash flows calculated as net *CSHRC* and *CSHPS*;	EARN	= earnings after taxation before extraordinary items.

The sample consists of 459 publicly traded Australian firms, including 2,170 Industrial firm-year observations and 1,211 Extractive firm-year observations, included on the ASX 300 index between January 2000 and December 2010. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. All variables are deflated by the issued number of ordinary shares at the financial year-end. In Panel B, insignificant correlations (two tailed p-value < 0.05), are shown by ‡.

Table 5-2, Panel A, also shows that mean operating cash flows are consistently larger than accruals for both industrial and extractive firms consistent with comparable descriptive statistics reported by Clinch *et al.* (2002). Further, subsequent to adopting IFRS there has only been a slight increase in the ratio of operating cash flows to accruals suggesting that these amounts did not change significantly after adopting IFRS. In contrast, there has been a significant increase in the ratio of mean/(median) intangible assets to net assets for industrial firms from 42% (18%) to 62 % (30%). For extractive firms however, intangible assets consistently comprise around 5% of net assets pre and post-IFRS. The change in the magnitude of intangible assets between AGAAP and IFRS shows that the separate treatment of intangible assets within the latter models is justified, as there has clearly been a large change in the amount of intangible assets in the balance sheet of the average industrial firms.

5.5 Empirical Results

To ensure the results are not unduly influenced by extreme observations, the same approach adopted by Francis and Schipper (1999) and Clinch *et al.* (2002) is followed by removing all observations with an absolute student residual greater than 3.0. Moreover, Newey and West (1987) correction procedures are used to adjust the standard errors and mitigate against potential problems associated with heteroskedasticity and first-order serial correlation. Finally, Variance Inflation Factors (VIF), are reported in Table 5-3 to 5-7 to identify potential problems of multicolinearity.[32]

[32] Multicolinearity is usually regarded as being high when the Variance Inflation Factors are greater than 10 (Lennox *et al.*, 2012; Tsalavoutas *et al.*, 2012).

Table 5-3 to 5-8 summarise the results for estimating regression Equations (5.1) to (5.5) before and after the adoption of IFRS for both industrial and extractive firms. The tables present the mean coefficients, two tailed *t*-statistics, and adjusted R^2 values for the pre-IFRS period (from January 2000 to December 2004), the post-IFRS period (from January 2005 to December 2010), and pooled regressions (from January 2000 to December 2010). Interactive dummy variables are included in the pooled regressions to test whether there is a significant change in the value relevance of the mean coefficients post-IFRS.[33]

5.5.1 Value Relevance of Earnings and Net Assets

Table 5-3, presents the results for the benchmark model (Equation, 5.1) which tests the value relevance of earnings and net assets pre and post-IFRS. The earnings coefficients for both samples of industrial and extractive firms are positive and significant under both AGAAP and IFRS. Further, results from the pooled regression of industrial firms report a significant and positive mean coefficient of 4.25 for the interactive earnings dummy variable 'EARN'. Earnings for industrial firms have therefore significantly increased in value relevance since the adoption of IFRS. Although there is no change in the value relevance of earnings for extractive firms, the results for the industrial sample are similar to those found by Aharony *et al.* (2010) who note a significant increase in the value relevance of earnings after the adoption of IFRS in the E.U.

This contrast in results between industrial and extractive firms is further emphasised by the fact that there has been a significant rise in the value relevance of net assets under IFRS for extractive firms. As a result, the initial tests suggest that the changes

[33] Variance Inflation Factors are not reported for the pooled regressions using interactive dummy variables, since this is simply an efficient method to test for the significance of the change in coefficients post-IFRS. Untabulated Wald tests were also conducted and both methods report consistent results.

brought about by IFRS adoption have had the strongest effect on earnings of industrial firms and on the balance sheets of extractive firms.

Table 5-3 Comparing the value relevance of aggregate earnings and net assets before and after the adoption of IFRS

$PRICE_{it} = \alpha + \beta_1 NETASS_{it} + \beta_2 EARN_{it} + \varepsilon_{it}$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.797***	0.474***	0.830***	0.301***	0.773***	0.294***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NETASS	0.661***	0.462***	0.570***	0.696***	1.514***	0.850***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EARN	8.272***	13.131***	9.223***	3.902***	3.773***	4.151***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_Intercept			-0.347**			0.452***
			(0.017)			(0.006)
D_NETASS			-0.149			0.674**
			(0.291)			(0.016)
D_EARN			4.254***			-0.394
			(0.000)			(0.715)
VIF Max	2.01	2.03		1.82	2.02	
VIF Mean	2.01	2.03		1.82	2.02	
n	1,019	1,111	2,133	449	744	1,200
Adjusted R^2	0.715	0.800	0.781	0.752	0.647	0.666

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. Variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Descriptive statistics in Table 5-2, Panel A, reveal intangible assets comprise a relatively small proportion of net assets for extractive firms, whilst representing more than 50% of industrial firms' net assets. Thus, if the IASB's changes to intangibles had led to a loss of valuable information, the greater impact would be expected for the sample of industrial firms.

Table 5-4 Comparing the value relevance of aggregate earnings, net assets and intangible assets before and after the adoption of IFRS

$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 EARN_{it} + \varepsilon_{it}$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.843***	0.473***	0.852***	0.301***	0.725***	0.298***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NA	0.411***	0.447***	0.359***	0.695***	1.683***	0.867***
	(0.001)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)
INTASS	0.794***	0.472***	0.727***	0.721***	0.127	0.480**
	(0.000)	(0.000)	(0.000)	(0.004)	(0.764)	(0.027)
EARN	8.775***	13.132***	9.627***	3.904***	3.857***	4.120***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
D_Intercept			-0.372***			0.404***
			(0.009)			(0.007)
D_NA			0.025			0.828***
			(0.881)			(0.003)
D_INTASS			-0.283*			-0.256
			(0.057)			(0.583)
D_EARN			3.856***			-0.484
			(0.001)			(0.648)
VIF Max	2.08	2.03		1.83	2.10	
VIF Mean	1.76	1.90		1.55	1.73	
n	1,020	1,111	2,133	449	745	1,199
Adjusted R^2	0.719	0.800	0.784	0.751	0.673	0.679

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. NA equals NETASS minus INTASS. Variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Investigating this further, Table 5-4 disaggregates net assets by removing intangible assets and treating this as a separate explanatory variable in Equation (5.2). As predicted, for the sample of industrial firms a significant decline in the value relevance of intangible assets is observed whilst intangible assets in extractive firms lose their significance after IFRS adoption. These findings corroborate the predictions of Matolcsy and Wyatt (2006) and recent findings by Chalmers *et al.* (2010) which reveal the changes to intangible assets causing a loss of useful financial information. Earnings

are still found to increase in value relevance for industrial firms while net assets increase in value relevance for extractive firms after the introduction of IFRS. IFRS has therefore caused a significant loss of value relevant information from the balance sheet for both industrial and extractive firms, due to the changes in accounting for intangible assets.

5.5.2 Disaggregating Earnings

By disaggregating earnings into its constituent parts, Table 5-5 to 5-8 present results for testing H1 and H2 by investigating the value relevance of operating cash flows and direct cash flow components pre and post-IFRS. Table 5-5 presents the results of Equation (5.3) which disaggregates earnings into operating cash flows and accruals (Sloan, 1996). In line with the significant increase in value relevance of earnings for industrial firms, support for H1 is found as a correspondingly significant rise in the value relevance of operating cash flows is observed. Pre-IFRS, the mean coefficient for operating cash flows is significant and positive for industrial firms. Moreover, the value relevance post-IFRS of operating cash flows in the pooled regression reveals a significant increase in the importance of operating cash flows in explaining firm value. Likewise, accruals, which are significantly positive under AGAAP and IFRS, also increased in value relevance for industrial firms under IFRS.

Table 5-5 Comparing the value relevance of operating cash flows, accruals, net assets and intangible assets before and after the adoption of IFRS

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 OCF_{it} + \beta_4 ACC_{it} + \varepsilon_{it}$$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.798***	0.362***	0.857***	0.297***	0.789***	0.294***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
NA	0.416***	0.351***	0.334***	0.656***	1.576***	0.833***
	(0.000)	(0.001)	(0.006)	(0.000)	(0.000)	(0.000)
INTASS	0.785***	0.382***	0.762***	0.668***	0.227	0.433*
	(0.000)	(0.000)	(0.000)	(0.007)	(0.576)	(0.063)
OCF	8.489***	12.961***	8.677***	3.840***	3.728***	4.077***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ACC	7.582***	10.166***	7.775***	3.403***	3.887***	3.698***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.003)
D_Intercept			-0.495***			0.479***
			(0.000)			(0.001)
D_NA			0.018			0.745***
			(0.913)			(0.006)
D_INTASS			-0.381***			-0.163
			(0.008)			(0.721)
D_OCF			4.283***			-0.182
			(0.000)			(0.868)
D_ACC			2.391**			0.738
			(0.041)			(0.652)
VIF Max	7.74	4.42		6.07	4.25	
VIF Mean	4.14	2.71		3.47	2.58	
n	1,019	1,109	2,133	449	743	1,197
Adjusted R^2	0.731	0.819	0.794	0.752	0.655	0.668

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. Variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

For extractive firms, there is no significant change in the relevance of operating cash flows, however, the significant increase in the value relevance of net assets under IFRS remains. The fact that there is no increase in the value relevance of operating cash flow needs to be interpreted carefully. Operating cash flows remains significant in the IFRS period, and so the disclosure of operating cash flow still provides value relevant

information for extractive firms. This may also be driven by the rise in the number of extractive firms compared with industrial firms in the post-IFRS sample period.[34] Consequently, and as noted previously, firms within this industry often experience a lengthy period with no or little operating cash flows whilst they are still in the exploration phase of their business cycle. Moreover, there is a large rise in the number of extractive firms reporting negative operating cash flows post-IFRS, up from 40% under AGAAP to 51% under IFRS. The increased number of new extractive firms' post-IFRS with very low and negative cash flows may explain, therefore, why there is no increase in value relevance of operating cash flows. Alternatively, however, net assets reported under IFRS may capture incremental information, which is reflected in prices for extractive firms, as the assets of these firms give an indication of future profitability once they are in the extraction phase.

In sum, these results present evidence that operating cash flows are value relevant pre and post-IFRS and that there is a significant increase in the value relevance of operating cash flows for industrial firms. The first hypotheses, H1, can therefore be accepted for the sample of industrial firms that the value relevance of operating cash flows increases under IFRS.

5.5.3 Disaggregating Cash Flows

Testing the second hypothesis H2, Equation (5.4) further disaggregates operating cash flows into 'core' and 'non-core' direct cash flows.[35] Table 5-6, Panel A presents

[34] Table 1, Panel A shows a significant rise in the number of Extractive firms in the post-IFRS period from 2005-2010. Pre-2005 there is an average of 92 Extractive firms each year, whereas post-2004 this average rises by 37% to 126 firms.

[35] Core operating cash flows are defined as the net of cash receipts from customers and cash payments to suppliers and employees. Non-core cash flows are defined as interest paid, net taxes paid or refunds received, and all other operating cash flows.

findings consistent with the more parsimonious model used in Table 5-5, as there is a significant increase in value relevance of both 'core' and 'non-core' operating cash flows and accruals under IFRS for the sample of industrial firms. Further, for extractive firms, core operating cash flows remain value relevant although there is a significant decline in the value relevance of non-core operating cash flows under IFRS. Other than the decline in value relevance of non-core operating cash flows for extractive firms, these findings are in line with the observations made for net operating cash flows in Table 5-5. Overall, however, these findings should be treated cautiously given the high multicolinearity reported for industrial firms, as the VIF is greater than 10.

To address the problem of high multicolinearity reported in Table 5-6, Panel A, a remedial measure recommended by Gujarati (1999) is followed by re-estimating Equation (5.4) after dropping non-core operating cash flows, one of the collinear variables. Non-core cash flows are chosen as the variable to be dropped as the focus of the research question is on core cash flows, which can only be obtained from a direct cash flow statement. Table 5-6, Panel B reports the results for the more restricted model and the VIF are now less than 10, thereby addressing the problem with high multicolinearity reported in Table 5-6, Panel A. Moreover, while the magnitude of the coefficients for core direct cash flows and accruals are lower than those reported in Table 5-6, Panel A, the findings presented in Table 5-6, Panel B, remain consistent with those reported in Table 5-6, Panel A.

Table 5-6 Comparing the value relevance of core and non-core operating direct cash flows, accruals, net assets and intangible assets before and after the adoption of IFRS

Panel A: Core and non-core direct cash flows, accruals, net assets and intangible assets

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 CORE\_OCF_{it} + \beta_4 NCORE\_OCF_{it} + \beta_5 ACC_{it} + \varepsilon_{it}$$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.782***	0.354***	0.841***	0.269***	0.793***	0.281***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
NA	0.432***	0.360***	0.350***	0.812***	1.556***	0.955***
	(0.000)	(0.001)	(0.004)	(0.000)	(0.000)	(0.000)
INTASS	0.773***	0.372***	0.749***	0.723***	0.204	0.532***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.629)	(0.006)
CORE_OCF	8.220***	12.793***	8.423***	3.667***	3.665***	4.124***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NCORE_OCF	7.967***	12.459***	8.170***	5.426***	3.185	6.067***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.119)	(0.000)
ACC	7.237***	10.038***	7.447***	3.210***	3.826***	3.848***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)
D_Intercept			-0.486***			0.458***
			(0.000)			(0.001)
D_NA			0.010			0.606**
			(0.949)			(0.037)
D_INTASS			-0.377***			-0.289
			(0.008)			(0.539)
D_CORE_OCF			4.371***			-0.755
			(0.000)			(0.491)
D_NCORE_OCF			4.289***			-4.987**
			(0.000)			(0.025)
D_ACC			2.590**			0.152
			(0.025)			(0.922)
VIF Max	40.74	15.61		8.75	6.84	
VIF Mean	16.67	6.42		3.91	3.27	
n	1,019	1,109	2,133	450	743	1,195
Adjusted R^2	0.735	0.820	0.795	0.754	0.655	0.683

Table 5-6 (continued)

Panel B: Core direct cash flows, accruals, net assets and intangible assets

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 CORE\_OCF_{it} + \beta_4 ACC_{it} + \varepsilon_{it}$$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.651***	0.467***	0.670***	0.278***	0.790***	0.269***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NA	1.285***	0.826***	1.312***	0.634***	1.518***	0.895***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTASS	1.307***	0.506***	1.394***	0.639*	0.156	0.432
	(0.000)	(0.000)	(0.000)	(0.050)	(0.718)	(0.161)
CORE_OCF	0.943**	6.166***	0.740***	2.231***	2.880***	2.063***
	(0.031)	(0.000)	(0.000)	(0.000)	(0.000)	(0.010)
ACC	-0.120	3.582***	-0.302	1.360*	3.044***	1.387
	(0.790)	(0.000)	(0.409)	(0.076)	(0.005)	(0.250)
D_Intercept			-0.245			0.467***
			(0.118)			(0.001)
D_NA			-0.431**			0.656**
			(0.016)			(0.028)
D_INTASS			-0.878***			-0.205
			(0.000)			(0.698)
D_CORE_OCF			5.367***			1.040
			(0.000)			(0.280)
D_ACC			3.659***			2.353
			(0.000)			(0.127)
VIF Max	1.64	3.25		6.12	4.24	
VIF Mean	1.39	2.17		3.42	2.58	
n	1,019	1,119	2,141	448	743	1,195
Adjusted R^2	0.630	0.740	0.716	0.716	0.651	0.676

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. NCORE_OCF is the accumulation of non-core operating cash flows calculated as the difference between OCF and CORE_OCF. All other variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Pooling data from different post-IFRS adoption years in Table 5-3 to 5-6 may mask what could be a temporary change in value relevance. Accordingly, Equation (4), restricted to exclude non-core operating cash flows to control for multicolinearity, is re-estimated on an annual basis for both industrial and extractive firms, and the results reported in Table 5-7. Consistent with a post-IFRS increase in value relevance for core direct cash flows, there is a significant and sustained increase in the magnitude of the coefficients for CORE_OCF for industrial firms for each year post-IFRS. Moreover, the findings for extractive firms confirm an increase in value relevance of net assets post-IFRS as evidenced by a significant increase in the interactive dummy variable NA in four out of the six years between 2005 and 2010. These findings confirm the earlier results, that the observed post-IFRS change in value relevance is significant and persistent.

Overall, the findings from Table 5-6 and Table 5-7 provide strong initial support for the value relevance of direct cash flows statements under IFRS across all industries. Moreover, post-IFRS adoption, while remaining value relevant across all industries, core direct cash flows significantly increase in value relevance for industrial firms. Further, for industrial firms, non-core direct cash flow information, which would be available in an indirect cash flow statement, is significantly more value relevant under IFRS than AGAAP. Core direct cash flows evidently capture incremental information which is reflected in prices for both industrial and extractive firms, but more so under IFRS for industrial firms.

Table 5-7 Annual comparison of the value relevance of core operating direct cash flows, accruals, net assets and intangible assets before and after the adoption of IFRS

	Industrial Firms						Extractive Firms					
Variable	Pre-IFRS Vs. FY2005	Pre-IFRS Vs. FY2006	Pre-IFRS Vs. FY2007	Pre-IFRS Vs. FY2008	Pre-IFRS Vs. FY2009	Pre-IFRS Vs. FY2010	Pre-IFRS Vs. FY2005	Pre-IFRS Vs. FY2006	Pre-IFRS Vs. FY2007	Pre-IFRS Vs. FY2008	Pre-IFRS Vs. FY2009	Pre-IFRS Vs. FY2010
Intercept	0.651***	0.660***	0.626***	0.616***	0.660***	0.660***	0.268***	0.231***	0.251***	0.231***	0.269***	0.268***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NA	1.285***	1.277***	1.354***	1.327***	1.277***	1.277***	0.772***	0.838***	0.862***	0.838***	0.895***	0.772***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTASS	1.307***	1.322***	1.399***	1.366***	1.322***	1.322***	0.648**	0.577*	0.521*	0.577*	0.432	0.648**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.043)	(0.059)	(0.088)	(0.060)	(0.163)	(0.043)
CORE_OCF	0.943**	0.949**	0.713***	0.911**	0.949**	0.949**	1.966***	2.254***	2.155***	2.254***	2.063**	1.966***
	(0.031)	(0.032)	(0.000)	(0.031)	(0.032)	(0.032)	(0.000)	(0.005)	(0.008)	(0.005)	(0.010)	(0.000)
ACC	-0.120	-0.089	-0.297	-0.101	-0.089	-0.089	1.459*	1.870	1.662	1.870	1.387	1.459*
	(0.790)	(0.844)	(0.376)	(0.817)	(0.844)	(0.844)	(0.061)	(0.104)	(0.154)	(0.104)	(0.253)	(0.061)
D_Intercept	0.158	-0.177	-0.388	-0.605**	-0.550**	-0.822***	0.276***	0.516***	0.777***	-0.114	0.549**	0.071
	(0.444)	(0.450)	(0.178)	(0.015)	(0.024)	(0.001)	(0.010)	(0.002)	(0.000)	(0.451)	(0.022)	(0.583)
D_NA	-0.666**	-0.906***	-0.560*	-0.851***	-0.547**	-0.387*	0.886***	0.506	0.845**	1.019***	0.475	0.882***
	(0.016)	(0.000)	(0.056)	(0.000)	(0.032)	(0.093)	(0.006)	(0.238)	(0.021)	(0.004)	(0.248)	(0.008)
D_INTASS	-0.528**	-0.771***	-0.978***	-1.375***	-1.098***	-1.029***	0.834	-0.170	-0.285	-0.064	-0.220	-0.437
	(0.010)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.433)	(0.815)	(0.651)	(0.885)	(0.768)	(0.649)
D_CORE_OCF	4.043***	7.203***	8.612***	7.089***	7.257***	7.902***	1.178	0.996	0.162	-1.172	1.736	1.366
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.211)	(0.477)	(0.869)	(0.307)	(0.205)	(0.451)
D_ACC	1.834	5.520***	2.931	5.472***	8.521***	8.911***	3.458**	1.696	-1.346	0.014	5.071**	1.828
	(0.129)	(0.000)	(0.161)	(0.000)	(0.000)	(0.000)	(0.042)	(0.470)	(0.573)	(0.994)	(0.018)	(0.368)
n	1,219	1,227	1,212	1,199	1,187	1,181	563	581	584	570	570	558
Adjusted R2	0.673	0.688	0.711	0.691	0.705	0.711	0.783	0.754	0.798	0.632	0.742	0.724

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors for the pooled regressions, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. Variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5-8 presents the results for Equation (5.5), which has the highest level of cash flow disaggregation. Given Equation (5.5) has by design two highly collinear variables, CSHRC and CSHPS, this final model naturally suffers from high multicolinearity. However, for completeness, and in order to be consistent with Clinch *et al.* (2002), the results of Equation (5.5) are reported, but these are only presented for consistency with prior research. The results show that direct cash flow components, with the exception of tax (TXP), are value relevant both pre and post-IFRS for the sample of industrial firms. Moreover, the mean coefficients for the interactive dummy variables show a significant increase in the value relevance of the two 'core' direct cash flow measures, namely, cash receipts from customers (CSHRC) and payments to suppliers and employees (CSHPS). Interest paid (INTP) and other operating cash flows (CSHOTH) increase in value relevance under IFRS. Accruals (ACC) are also found to be value relevant for industrial and extractive firms under both AGAAP and IFRS, but there is no increase in relevance since the adoption of IFRS.

Much like industrial firms, the direct cash flow components for the sample of extractive firms all reveal a strong association with the share price under both AGAAP and IFRS, with the exception of INTP and TXP, which are insignificant at levels less than 5% post-IFRS. However, in contrast to the findings for industrial firms, based on the dummy variables from the pooled regressions for extractive firms, adopting IFRS has only resulted in a significant change in the value relevance of CSHOTH after the adoption of IFRS. Consistent, with a rise in the number of extractive firms, as shown in Table 5-2, reporting positive other operating cash flows (CSHOTH) pre-IFRS, but negative CSHOTH under IFRS, there is a change in signs of the coefficient for net other operating cash flows.

Table 5-8 Comparing the value relevance of direct operating cash flow components, accruals, net assets and intangible assets before and after the adoption of IFRS

$$PRICE_{it} = \alpha + \beta_1 NA_{it} + \beta_2 INTASS_{it} + \beta_3 CSHRC_{it} + \beta_4 CSHPS_{it} + \beta_5 INTP_{it} + \beta_6 TXP_{it} + \beta_7 CSHOTH_{it} + \beta_8 ACC_{it} + \varepsilon_{it}$$

	Industrial firms			Extractive firms		
Variable	Pre-IFRS	Post-IFRS	Pooled	Pre-IFRS	Post-IFRS	Pooled
Intercept	0.740***	0.376***	0.796***	0.280***	0.468***	0.304***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NA	0.416***	0.373***	0.323***	0.832***	2.341***	0.975***
	(0.000)	(0.003)	(0.009)	(0.000)	(0.000)	(0.000)
INTASS	0.745***	0.413***	0.689***	0.740***	0.777*	0.479**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.052)	(0.022)
CSHRC	7.518***	9.693***	7.424***	3.666***	3.538***	3.911***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
CSHPS	7.512***	9.664***	7.415***	3.682***	3.695***	3.887***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
INTP	7.999***	12.795***	8.188***	6.596***	8.243*	9.809***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.098)	(0.000)
TXP	4.031**	-0.043	2.491	3.632***	1.533	4.366***
	(0.028)	(0.987)	(0.301)	(0.000)	(0.592)	(0.002)
CSHOTH	7.321***	9.478***	7.249***	5.962***	-4.674***	7.446***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
ACC	6.566***	7.516***	6.610***	3.454***	4.619***	3.606***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
D_Intercept			-0.443***			0.209*
			(0.000)			(0.078)
D_NA			-0.030			1.202***
			(0.857)			(0.000)
D_INTASS			-0.334**			0.216
			(0.023)			(0.626)
D_CSHRC			2.818**			-0.599
			(0.016)			(0.568)
D_CSHPS			2.797**			-0.428
			(0.018)			(0.682)
D_INTP			4.317*			-4.447
			(0.077)			(0.401)
D_TXP			-1.663			-4.019
			(0.624)			(0.172)
D_CSHOTH			2.787**			-11.967***
			(0.019)			(0.000)
D_ACC			1.532			0.896
			(0.208)			(0.550)
n	1,020	1,113	2,130	450	745	1,200
Adjusted R^2	0.734	0.827	0.808	0.755	0.763	0.752

All explanatory variables are deflated by the issued number of ordinary shares at the financial year-end. "Pre-IFRS" includes all firms with financial years ending up to and including December 31, 2004, whereas "Post-IFRS" incorporates all firms with financial years ending on or after January 1, 2005. "Pooled" regressions include all firms spanning both the pre and post-IFRS period. When estimating the coefficients' standard errors, Newey and West (1987) robust estimators are used to correct standard errors for both heteroskedasticity and first-order serial correlation. Variable definitions are as reported in Table 5-2. Dummy variables are prefixed by "D", taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Taken as a whole, these findings provide strong evidence of direct cash flows reported under IFRS capturing incremental information which is reflected in the stock prices. Specifically, 'core' cash flows that are unavailable under indirect cash flow statements are value relevant and reflected in share price across all industries. Further, 'core' direct cash flows at the very least remain value relevant after the move to IFRS, and for industrial firms they are shown to increase significantly in value relevance under IFRS. The second hypothesis H2 can therefore be accepted, that there will be a rise in the value relevance of direct cash flow components under IFRS.

5.5.4 Robustness Tests

Although Australian firms were prohibited from full early voluntary adoption of IFRS, they were required to report on the impact of adopting IFRS in their 2005 financial statements. To account for the release of this information to investors in 2005, firm-year observations were included from this year as part of the post-IFRS sample period. However, in order to test the robustness of the findings all 2005 firm-year observations were dropped in following Jones and Finley (2011). The results for all of the models remained consistent with the above findings. In addition, all the analysis was re-estimated to include industry level dummies in all the models to control for any unobserved industry group effects. Once more, the results of the analysis including industry controls remain qualitatively similar to the above findings. Finally, Wald tests were used to examine the change in value relevance of direct cash flow disclosures and the results are consistent with those presented above.

5.6 Conclusions

Currently, the IASB and FASB are proposing that direct cash flow statements become mandatory for all companies under their harmonised cash flow reporting joint project. While there is strong academic evidence to support the mandating of direct cash flow statements given their usefulness to users of accounts (e.g., Jones *et al.*, 1995; Clinch *et al.*, 2002; Goyal, 2004), there are a number of critics of the proposal to mandate the direct method given the cost of disclosure (Hales and Orpurt, 2012). This chapter therefore analyses whether direct cash flow disclosures remain value relevant for a sample of Australian firms, to test whether direct cash flow statements continue to capture the rich information set reflected in stock prices in an IFRS reporting environment.

The results provide strong evidence that direct cash flow statements are a value relevant disclosure under AGAAP and IFRS, and that this result holds for both industrial and extractive firms. Moreover, for the sample of industrial firms the findings reveal that there has been an increase in the value relevance of direct cash flows since the adoption of IFRS. In addition, 'core' and 'non-core' cash flow disclosures are found to increase in value relevance for industrial firms under IFRS. Consequently, if the IASB were to mandate direct cash flow statements it would, in all likelihood, provide users of accounts with a valuable incremental source of information.

The observed increase in value relevance for industrial firms under IFRS is also consistent with increased uncertainty around the accounting numbers that are being disclosed. Based upon the evidence of Bissessur and Hodgson (2011), the move to IFRS created a degree of uncertainty in the accounting numbers being disclosed. In particular, and consistent with Chalmers *et al.* (2010), for industrial firms the findings provides

evidence that IFRS has resulted in a loss of value relevant information regarding intangibles. As a result, an increase in the value relevance of direct cash flow numbers is unsurprising in times of uncertainty. In addition, the sample period also includes one of the biggest periods of uncertainty in recent times, namely the financial crisis, and so a continued reliance on direct cash flow numbers is again unsurprising. Ultimately, whether the increased value relevance on direct cash flow numbers persists beyond the current market turmoil would merit future investigation. Regardless of this, the findings in this chapter present strong evidence that direct cash flow disclosures are value relevant in an IFRS reporting environment.

While this chapter provides strong evidence that direct cash flow statements provide investors with useful information under AGAAP and IFRS, survey results by the CFA Institute also show financial analysts are a significant proponent of direct cash flow statements. Analysts' assert that direct cash flow statements provide useful information when forecasting future cash flows. Moreover, these survey results have provided the IASB and FASB with strong evidence to support their proposal to mandate direct cash flow statements. Accordingly, the subsequent empirical chapter examines whether financial analysts use information from direct cash flow statements when forecasting cash flows under AGAAP and IFRS. Further, Chapter 6 investigates whether analysts find information from direct cash flow statements more useful for forecasting cash flows under IFRS, when compared to AGAAP.

6
Direct Cash Flow Statements and Analyst Cash Flow Forecast Accuracy under IFRS

6.1 Introduction

The recent proposal by the International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) to mandate direct cash flow statements received strong support from financial analysts.[36] Survey results conducted by the CFA Institute show most analysts believe direct cash flow statements provide better information for forecasting future cash flows and measuring earnings quality than indirect cash flow statements.[37] These results are unsurprising given the strong empirical evidence which shows direct cash flow statements provide incremental information when forecasting future cash flows under local Generally Accepted Accounting Principles (GAAP) (e.g., Krishnan and Largay III, 2000; Orpurt and Zang, 2009; Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). However, although these studies advocate direct cash flow reporting, the more recent studies do so after specifically excluding all observations since the adoption of International Financial Reporting Standards (IFRS), reasoning that financial reports under IFRS were significantly different to local GAAP (Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). This reasoning was a priori confirmed by the Australian Accounting Standards Board (AASB) who predicted IFRS would significantly change financial reporting and benefit users by providing relevant and reliable financial information (Fenton-Jones,

[36] See the FASB Proposed Accounting Standards Update published in July 2010 (paragraph 177).
[37] See the CFA Institute Member Poll: Cash Flow Survey published in 2009.

2003). Providing further evidence of these changes, empirical studies found significant improvements in the quality and comparability of Australian financial reports, evidenced by a significant rise in the accuracy of analysts' earnings forecasts under IFRS (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012), which is consistent with other international studies (e.g., Byard *et al.*, 2011; Tan *et al.*, 2011; Horton *et al.*, 2012).

Examining the usefulness of direct cash flow statements to forecast cash flows under IFRS would provide both the IASB and FASB empirical evidence, to assist with the decision of whether or not direct cash flow reporting should be mandatory. Further, while prior studies substantiate that direct cash flow components improve the accuracy or explanatory power of random walk cash flow prediction models, to date, no research has empirically tested whether financial analysts find this information useful when predicting cash flows. A significant factor behind the motivation for the joint proposal by the FASB and IASB to mandate direct cash flow statements is the recent CFA Institute survey findings showing financial analysts' strongly support the use of direct cash flow statements. Whether financial analysts actually use direct cash flow statements when predicting future cash flows, and whether this information remains useful under IFRS, are the two questions that this chapter aims to address.

By using a sample of non-financial Australian companies listed on the ASX300 from 2000-2010 this chapter examines whether analysts find direct cash flow statements useful when predicting annual cash flows, and whether this has changed under IFRS compared to local GAAP. Moreover, this chapter examines whether the accuracy of analysts' cash flow predictions has improved under IFRS, and if the improvement is associated with an increased use of direct cash flow components. Australia provides an ideal context in which to test these questions since the use of direct cash flow

statements was mandatory until 2007, after which most firms continued to use this approach for the remainder of the sample period. Further, Australian firms were prohibited from early adoption of IFRS, and so all firms commenced reporting under IFRS for fiscal years beginning on or after 1 January 2005. There is, therefore, a distinct break in time, which permits the examination of analysts' use of direct cash flow statements before and after IFRS adoption, and whether analysts' cash flow forecast errors change under IFRS.

The main findings show financial analysts do use information from direct cash flow statements when predicting annual cash flows across the entire sample period and significantly more so under IFRS. Further, analyst cash flow forecast errors are shown to significantly decline under IFRS, suggesting that IFRS adoption improved the quality of analysts' information environment. Taken together, these findings support the assertion made by standard setters and analysts that direct cash flow statements provide useful information for predicting cash flows. This suggests that the proposal of the IASB and FASB is not without its merits, and if implemented could further improve the information environment for users of financial accounts.

6.2 Background and Hypothesis Development

6.2.1 Direct Cash Flows and Forecasting

Since cash flow reporting requirements were standardised three decades ago, on-going debates have focussed on the benefits of reporting operating cash flows using the direct method. Academics have generally favoured the direct method (e.g., Jones *et al.*, 1995; McEnroe, 1996; Smith and Freeman, 1996; Jones and Ratnatunga, 1997; Jones and Widjaja, 1998; Goyal, 2004). Moreover, standard setters have asserted that information

from direct cash flow statements is useful when forecasting future cash flows.[38] Nevertheless, Australia, New Zealand and China are historically the only countries that required the mandatory use of direct cash flow statements (Wallace *et al.*, 1997; Clinch *et al.*, 2002).[39] All other nations, which provided a choice between the two approaches, found most companies applied the indirect approach.[40] The recent IASB/FASB proposal to mandate the use of direct cash flow statements has therefore provoked a significant response.[41] Based on the comment letters, it is evident that most preparers remain unconvinced about the stated benefits of direct cash flow reporting, especially given the perceived high costs of changing information systems to capture this information.[42]

However, in contrast to this feedback, a recent survey conducted by the Institute of Chartered Financial Analysts (CFA Institute) found most respondents were in favour of mandating the use of direct cash flow statements. 63% *'strongly agreed'* or *'agreed'* that information from direct cash flow statements could improve analyst cash flow forecast accuracy and would also provide useful measures of earnings quality. Further, 94% voted *'Revenue collections from customers'*, which is only reported in direct cash flow statements, to be the most important information disclosed as part of cash flows from operating activities.[43] This supports the arguments put forward by academics, which note the theoretical superiority of direct cash flow statements by arguing this

[38] See for example, U.S. accounting standard SFAS 95: Statement of Cash Flows, issued in 1987 (paragraph 107), or the International Accounting Standards Board (IASB) standard IAS 7: Statement of Cash Flows, issued up to 2009 (paragraph 19), and Australian accounting standard AASB 1026: Statement of Cash Flows, issued in 1997(paragraph 6.2.2).
[39] In 2007 the AASB amended AASB 107: Statement of Cash Flows by issuing Amendments to Australian Accounting Standards 2007-4 allowing firms the choice of reporting operating cash flows indirectly thereby aligning themselves with IFRS.
[40] Orpurt and Zang (2009) reveal that less than 2% of all firms in America currently use the direct method.
[41] See the FASB Proposed Accounting Standards Update published in July 2010 (paragraph 177).
[42] See the comment letters from the FASB Preliminary Views on Financial Statement Presentation Reference Number: 1630-100 published in 2009.
[43] See the CFA Institute Member Poll: Cash Flow Survey published in 2009.

method to be less confusing (Paton, 1963), providing better information (Thomas, 1982), and having better linkage to the income statement (Ketz and Largay III, 1987), compared to the indirect method. Moreover, and consistent with the recent CFA institute findings, direct cash flow statements were also asserted to provide useful information for credit analysis (Heath, 1978).

Empirically examining the usefulness of direct cash flow information, Livnat and Zarowin (1990) provide the first evidence for the value relevance of direct cash flows. By estimating direct cash flow components, they find a significant association between abnormal stock returns and unexpected changes in direct cash flow components. Extending this study, Clinch *et al.* (2002) use a sample of Australian firms providing further evidence of the value relevance of direct cash flows. By using actual, rather than estimated, direct cash flow components, they find annual stock returns are better explained by direct cash flow components, compared to aggregate operating cash flows, when controlling for their ability to predict future operating cash flows.

These results corroborate earlier findings by Krishnan and Largay III (2000) who also find strong evidence in support of the widely held belief that direct cash flow statements provide useful information for predicting next year's cash flows. By using a sample of U.S. firms voluntarily reporting direct cash flows, their results show an increased accuracy for their cash flow prediction models after including direct cash flow components as explanatory variables. Providing further support for the predictive power of direct cash flow statements, subsequent U.S. (Cheng and Hollie, 2008; Orpurt and Zang, 2009), and Australian (Arthur and Chuang, 2008; Arthur *et al.*, 2010) studies also confirm a significant increase in accuracy and explanatory power after including estimated or reported direct cash flow components in their models. However, despite

these findings affirming the usefulness of direct cash flow statements, there is no known study that has investigated whether analysts' use information from direct cash flow statements to predict future cash flows.

6.2.2 Analysts' Use of Direct Cash Flow Components

Providing cash flow forecasts alongside earnings forecasts is a relatively new and growing phenomenon. DeFond and Hung (2007) sample more than 70,000 earnings forecasts from 36 countries. These results show a rise in the number of earnings forecasts being accompanied by cash flow forecasts up from only 30% in 1994 to 58% in 2002. Examining this trend, DeFond and Hung (2003) find that analysts issue cash flow forecasts as a complement to their earnings forecasts in response to market demand for price relevant information for firms with volatile earnings, high accruals, and poor financial health. Further, issuing both earnings and cash flow forecasts is found to significantly increase the accuracy of analysts' earnings forecasts (Call *et al.*, 2009), whilst at the same time providing an external deterrent to managers undertaking earnings management (Call, 2008; McInnis and Collins, 2011).

There is, however, debate as to whether analysts' cash flow forecasts are really a sophisticated projection of future cash flows (DeFond and Hung, 2003; Call *et al.*, 2012) or rather a simple adjustment of their earnings forecast (Givoly *et al.*, 2009). Although Givoly *et al.* (2009) and Call *et al.* (2012) argue the sophistication of analysts cash flow forecasts, both agree that analysts cash flow forecasts outperform the more mechanical Barth *et al.* (2001b) time series prediction models based on lagged earnings components. Further evidence for the sophistication of analysts cash flow forecasts is provided by Call *et al.* (2012), when analysing random samples of full text analyst reports. Their analysis showed 80% of analysts considered working capital and other accrual

adjustments when predicting cash flows. However, to date, extant research examining the sophistication of analysts' cash flow forecasts assumes analysts use information from indirect cash flow statements as much of this research is based in the U.S. (e.g., DeFond and Hung, 2003; Call *et al.*, 2012).

Investigating whether the layout of operating cash flows would influence the accuracy of cash flow predictions, Hodder *et al.* (2008) exploit an experimental setting of 50 business graduates, providing them with either an indirect cash flow statement which reconciles net income to operating cash flows, or, the same information, but this time reconciling operating cash flows to net income. Their results show significantly higher forecast errors and dispersion in the sample of graduates using traditional indirect cash flow statements, implying that the structure of operating cash flows can significantly affect users' abilities to forecast cash flows accurately. This may explain why feedback from the 2009 CFA Institute survey show financial analysts agree that information from direct cash flow statements would improve the accuracy of future cash flow forecasts, and provides motivation for the first hypothesis:

H1: Analysts will find direct cash flow components useful in forecasting future cash flows.

6.2.3 IFRS Adoption and Analysts' Use of Direct Cash Flow Components

Both prior to the adoption of IFRS in 2005, and for two years subsequently, Australia mandated the use of direct cash flow statements until, in 2007, they provided the option of using an indirect cash flow statement. Before Australia's adoption of IFRS, there were already signs from European markets that investors anticipated the mandatory European Union (E.U.) wide adoption of IFRS would improve the information set reported by firms under the new standards (Armstrong *et al.*, 2010). This was shown by

a series of positive European market reactions following announcements for the mandatory adoption of IFRS in the E.U. Subsequently, E.U. and Australian studies corroborated these investor sentiments finding a general reduction in cost of capital and improved capital market liquidity after the mandatory adoption of IFRS (Daske *et al.*, 2008). While there was concern that, under IFRS, fair value accounting would increase earnings volatility (Ball, 2006), overall, annual reports prepared under IFRS appeared to provide a richer information set than was previously available under local GAAP.

Daske *et al.* (2008), however, also noted that the increased market liquidity under IFRS only occurred in countries with strong reporting incentives and legal enforcement of accounting standards. This is consistent with the views of Ball (2006) and Soderstrom and Sun (2007), who hypothesised, that, the effectiveness of the enforcement of IFRS would significantly influence the perceived benefits associated with adopting the new standards. Further, emphasising the important role of effective enforcement after Europe's mandatory adoption of IFRS, Byard *et al.*'s (2011) results show analyst earnings forecast errors decline significantly, but only in countries with a strong legal environment. Australia has a strong legal environment, and recent findings show a significant increase in analysts' earnings forecast accuracy under IFRS (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012). These are consistent with the global study, including Australia, of Horton *et al.* (2012), which also found significant improvements in analysts' information environment post-IFRS.

After the adoption of IFRS in Australia, Bissessur and Hodgson (2011) and Cotter *et al.* (2012) state that the significant decline in analyst earnings forecast errors is a consequence of IFRS providing Australian analysts with a far richer source of information than was previously available. This is consistent with the view of analysts

acting as information intermediaries who utilise a range of information sources, one of which is the annual report, to arrive at their earnings and cash flow forecasts (Barth and Hutton, 2004). However, Bissessur and Hodgson (2011) and Cotter *et al.* (2012), do not consider the sources of information in the annual report that are used by analysts to improve their forecasts.

Sloan (1996) identifies two key sources of information used by analysts in financial accounts are historical accruals and operating cash flows, with operating cash flows providing a useful source of information given their persistence. When Australia adopted IFRS in 2005, there were no major changes to cash flow reporting between AASB 1026, and the IFRS equivalent to IAS 7, AASB 107 *Statement of Cash flows*. Australian cash flow disclosure requirements, therefore, have remained consistent under both AGAAP and IFRS, while the reporting of net assets and earnings changed.

Given the consistency in reporting direct cash flows pre and post-IFRS, Australia provides an ideal setting to examine how IFRS adoption may have changed the usefulness of information from direct cash flow statements. Recent Australian studies, examining the predictive power of direct cash flows, cited the significant changes to the measurement of earnings and accruals under IFRS as reasons to exclude all observations under IFRS (Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). However, excluding observations under IFRS fails to consider how the usefulness of this information may have changed. While cash flow reporting requirements have remained unchanged by the adoption of IFRS in Australia, Bissessur and Hodgson (2011) and Cotter *et al.* (2012) find that there has been an overall improvement in analysts' ability to more accurately forecast earnings. If IFRS provides a richer information set than previously available, the overall importance of direct cash flow

information should also increase, as it is an established source of information for financial analysts, which would be complemented by the improved information set provided by IFRS when forecasting future cash flows. Accordingly, the next hypothesis states:

H1b: Analysts will find direct cash flow components significantly more useful in forecasting future cash flows after adopting IFRS.

6.2.4 IFRS Adoption and Analysts' Information Environment

Investigating the impact of IFRS adoption on financial analysts earnings forecasts, empirical studies conclude IFRS adoption improves analysts information environment for predicting earnings, as evidenced by increased forecast accuracy after early voluntary IFRS adoption (Ashbaugh and Pincus, 2001; Bae *et al.*, 2008; Hodgdon *et al.*, 2008). Further, analyst earnings forecast errors also dropped significantly after the mandatory adoption of IFRS, corroborating these findings within a mandatory adoption framework (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012; Horton *et al.*, 2012). Moreover, the greatest improvements in the accuracy of analyst earnings forecasts were found in countries with strong enforcement of accounting standards, and significant differences between local GAAP and IFRS (Byard *et al.*, 2011). Consistent with an earlier study by Hope (2003), strong enforcement of the new accounting standards allowed the IFRS accounts to provide financial analysts with a richer information set.

Given Australia's strong enforcement of accounting standards, and the notable[44] differences between local GAAP and IFRS, recent studies have found a strong improvement in the accuracy of earnings forecasts by Australian analysts (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012). Prohibiting the voluntary adoption of IFRS, and actively enforcing accounting standards, makes Australia an ideal country to examine the impact of IFRS adoption on analysts' information environment. However, while studies provide strong evidence that IFRS adoption improved financial analysts' information environment, they do so using changes in the accuracy of analysts' earnings forecasts as a proxy for information changes. To date, no research has considered changes in the accuracy of analysts' cash flow forecasts as an alternative proxy for information changes. According to the IASB financial reporting framework, an underlying objective of financial statements prepared according to IFRS is providing users with information that will be useful in assessing an entities prospect of generating future cash inflows.[45] It follows, therefore, that if the adoption of IFRS has improved analysts' information environment, financial analysts would be expected to forecast annual cash flows more accurately. Accordingly, the next hypothesis states:

H2: Analysts' cash flow forecast errors will significantly reduce after adopting IFRS.

[44] Some of the more significant differences between Australian GAAP and IFRS include: IFRS prohibiting the disclosure of extraordinary items; disallowing the use of the full liability method of accounting for deferred taxation; prohibiting the recognition of certain non-goodwill related internally generated intangible assets; accounting for changes in the fair value of investment properties through the income statement rather than the statement of changes in equity; providing far more comprehensive requirements and guidance for the recognition and disclosure of financial instruments; requiring the recognition and disclosure of all share based payments irrespective of whether they were applicable to directors, executives or all staff. (Deloitte, Differences between current Australian GAAP and Australian equivalents to IFRS, published in August 2004).

[45] See paragraph OB3 of the September 2010 IFRS Foundation Conceptual Framework

Comparing the forecast accuracy of different cash flow prediction models, Krishnan and Largay III (2000) found the lowest mean absolute percentage error for the model that included direct cash flow components. They conclude that historical direct cash flow components provide more useful information than historical indirect cash flows when predicting future cash flows. The previous hypotheses have considered whether analysts use direct cash flow components to forecast cash flows, and if there has been a significant increase in the use of direct cash flow components under IFRS. Further, H2 predicts an improvement in analysts' information environment post-IFRS as evidenced by reduced cash flow forecast errors. It follows, therefore, that should financial analysts find direct cash flows useful, and even more so under IFRS, any improvement in forecast accuracy under IFRS will be partly due to analysts' increased use of direct cash flow components. Accordingly, the final hypothesis states:

H2b: Improvements in analysts' cash flow forecast accuracy post-IFRS will be significantly associated with analysts' increased use of direct cash flow components post-IFRS.

6.3 Research Design and Sample Selection

6.3.1 Analysts' Cash Flow Forecasts and Direct Cash Flow Components

Addressing the first hypotheses, the following equations modify the models used by Krishnan and Largay (2000) and Barth *et al.* (2001b) by exploiting analysts median consensus forecast of annual cash flows per share, rather than future reported operating cash flows, as the dependent variable. This, therefore, allows the examination of whether or not financial analysts' forecasts are explained by historical cash flow information. In order to examine the change in the usefulness of the information from

direct cash flow statements after adopting IFRS, the coefficients generated by each model are compared before and after January 2005, and then tested for any change by applying interactive dummy variable coefficients. Using the benchmark Equation (6.1), this chapter starts by examining analysts' use of aggregate operating cash flows and accruals:

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 OCF_{j,t} + \beta_2 \Delta WCapital_{j,t} + \beta_3 \Delta OthOpA\&L_{j,t} + \beta_4 DepAmort_{j,t} + \beta_5 OthAcc_{j,t} + \sum_{j}^{6} \beta_{6j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.1)$$

Where $For\_OCF_{j,t+4}$ is analysts' median consensus forecast of annual cash flows per share for firm *j* made four months after the financial year-end as per Thomson Reuters Institutional Brokers' Estimate System (I/B/E/S). $OCF_{j,t}$ is the annual net operating cash flow for firm *j*, standardised by the issued number of ordinary shares at the financial year-end. $\Delta WCapital_{j,t}$, $\Delta OthOpA\&L_{j,t}$, $DepAmort_{j,t}$, and $OthAcc_{j,t}$ are accruals, standardised by the issued number of ordinary shares at the financial year-end, and included as right hand side variables in all the models as a means of controlling for financial analysts' use of historical accrual information in addition to cash flow information when forecasting next year's cash flows. $\Delta WCapital_{j,t}$ is the net change in working capital accruals calculated as the sum of changes in accounts receivable and changes in inventory, less the sum of changes in accounts payable and taxation payable, as reported in the reconciliation of earnings to operating cash flows as part of the notes to the cash flow statement. $\Delta OthOpA\&L_{j,t}$ is the net change in other operating assets and liabilities, and $DepAmort_{j,t}$ is the sum of depreciation and amortisation, as reported in the reconciliation of earnings to operating cash flows as part of the notes to the cash

flow statement. $OthAcc_{j,t}$ is the sum of all other operating accruals calculated as the difference between earnings after taxation before extraordinary items and *OCF*, minus *(*$\Delta WCapital + \Delta OthOpA\&L + DepAmort$*).*

The remaining three models expand Equation (6.1) by decomposing $OCF_{j,t}$ into components found only in direct cash flow statements. The purpose is to examine the relative importance placed by financial analysts on each cash component and their change in usefulness to financial analysts after the adoption of IFRS. Cheng and Hollie (2008) find disaggregating operating cash flows into 'core' and 'non-core' direct cash flow components improved the accuracy of cash flow prediction models. Accordingly, the next equation examines analysts' use of 'core' and 'non-core' direct cash flow components when forecasting cash flows:

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 Core\_OCF_{j,t} + \beta_2 NCore\_OCF_{j,t} + \beta_3 \Delta WCapital_{j,t} + \beta_4 \Delta OthOpA\&L_{j,t} + \beta_5 DepAmort_{j,t} + \beta_6 OthAcc_{j,t} + \sum_{j}^{6} \beta_{7j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.2)$$

Where $Core\_OCF_{j,t}$ is 'core' direct cash flows calculated as the net of cash receipts from customers and cash payments to suppliers and employees and $NCore\_OCF_{j,t}$ is 'non-core' operating cash flows calculated as $OCF_{j,t}$ minus $Core\_OCF_{j,t}$.[46] Equations (6.3) and (6.4) provide a further break down of direct cash flows by disaggregating $Core\_OCF_{j,t}$ and $NCore\_OCF_{j,t}$ into their components. $Core\_OCF_{j,t}$ has historically been found to provide information that is more useful than $NCore\_OCF_{j,t}$ when predicting future cash flows (Cheng and Hollie, 2008), and earnings (Arthur *et al.*,

[46] Non-core operating cash flows include interest paid, taxes paid, and all other operating cash flows, excluding cash receipts from customers and cash payments to suppliers and employees.

2010). Accordingly, the third model disaggregates $Core\_OCF_{j,t}$ into its components to examine analysts' use of this information when forecasting cash flows:

$$\begin{aligned} For\_OCF_{j,t+4} &= \beta_0 + \beta_1 CSHRC_{j,t} + \beta_2 CSHPS_{j,t} + \beta_3 NCore\_OCF_{j,t} \\ &+ \beta_4 \Delta WCapital_{j,t} + \beta_5 \Delta OthOpA\&L_{j,t} + \beta_6 DepAmort_{j,t} + \beta_7 OthAcc_{j,t} \\ &+ \sum_{j}^{6} \beta_{8j} INDUSTRY_{j,t} + \varepsilon_{j,t} \end{aligned} \tag{6.3}$$

Where $CSHRC_{j,t}$ is cash receipts from customers, $CSHPS_{j,t}$ is cash payments to suppliers and employees. Finally, Equation (6.4) provides an examination of how analysts use all the information available from the operating section of a direct cash flow statement when forecasting cash flows by disaggregating both $Core\_OCF_{j,t}$ and $NCore\_OCF_{j,t}$ into their constituent parts:

$$\begin{aligned} For\_OCF_{t+4} &= \beta_0 + \beta_1 CSHRC_t + \beta_2 CSHPS_t + \beta_3 INTP_t + \beta_4 TXP_t \\ &+ \beta_5 CSHOTH_t + \beta_6 \Delta WCapital_{j,t} + \beta_7 \Delta OthOpA\&L_{j,t} + \beta_8 DepAmort_{j,t} \\ &+ \beta_9 OthAcc_{j,t} + \sum_{j}^{6} \beta_{10j} INDUSTRY_{j,t} + \varepsilon_{j,t} \end{aligned} \tag{6.4}$$

Where $INTP_{j,t}$ is interest paid, $TXP_{j,t}$ is net taxes paid or tax refunds received, and $CSHOTH_{j,t}$ is all other operating cash flows. To ensure the results are not unduly influenced by extreme observations, the same approach used by both Francis and Schipper (1999) and Clinch *et al.* (2002) is followed by removing all observations with an absolute student residual greater than 3.0. In addition, the White (1980) correction

procedure is used to adjust the standard errors to mitigate against potential problems associated with heteroskedasticity.[47]

6.3.2 Change in Analyst Forecast Accuracy

Investigating the second hypothesis, analysts' cash flow forecast error are calculated as the price standardised absolute difference between the median consensus cash flow forecast and the actual reported cash flow per share from I/B/E/S (Hodder *et al.*, 2008; Givoly *et al.*, 2009):

$$AFE_{j,T} = \frac{|\, ACPS_{j,t} - FCPS_{j,t-8} \,|}{P_{j,ttot-8}} \tag{6.5}$$

Where, $AFE_{j,T}$ is the analyst cash flow forecast error per share for firm *j* at time *T*, calculated as the absolute difference between the reported cash flow per share for firm *j* at time *t* ($ACPS_{j,t}$), and analysts' median consensus cash flow forecast per share for firm *j* 8 months prior to time *t* ($FCPS_{j,t-8}$), standardised by the average share price for firm *j* over the forecast period ($P_{j,ttot-8}$).[48] Both $ACPS_{j,t}$ and $FCPS_{j,t-8}$ are obtained from the I/B/E/S database.

6.3.3 IFRS Adoption and Analysts' Cash Flow Forecasts Accuracy

Using $AFE_{j,T}$ as the dependent variable, a modified version of the model employed by Hodder *et al.* (2008) is used in a pooled regression to test the hypothesis of whether

[47] As a measure of robustness, following Hodder *et al.* (2008), all the results were re-estimated by adjusting the standard errors to control for firm level clustering over time. Since the results remained qualitatively similar to the above findings, only the White (1980) corrected standard errors have been reported in the tables.

[48] Following Hodder *et al.* (2008), the absolute error is used since the primary purpose when using this model in this chapter is to examine analysts' average accuracy, rather than analysts' bias.

analyst cash flow forecast accuracy has significantly improved since the adoption of IFRS:

$$\begin{aligned} AFE_{j,T} &= \beta_0 + \beta_1 IFRS + \beta_2 \sigma OCF_{j,T-6toT-1} + \beta_3 \sigma \Delta WCA_{j,T-6toT-1} + \beta_4 MIXED_{j,T-1} \\ &+ \beta_5 NEGOCF_{j,T-1} + \beta_6 SIZE_{j,T-1} + \beta_7 GROWTH_{j,T-1} + \beta_8 PROFITABILITY_{j,T-1} \\ &+ \beta_9 NANAL_{j,T-1} + \beta_{10} OP\_CYCLE_{j,T-1} + \sum_{j}^{6} \beta_{11} INDUSTRY_{j,T-1} + \varepsilon_{j,T} \end{aligned} \quad (6.6)$$

Where, $AFE_{j,T}$ is as defined in Equation (6.5). *IFRS* is included as a proxy to measure the change in $AFE_{j,T}$ since the adoption of IFRS, and is set to equal 1 if the financial year-end is on or after January 1, 2005, and 0 otherwise. A negative coefficient on *IFRS* is predicted because analysts' cash flow forecast errors are expected to significantly decline after the adoption of IFRS due to the richer information set provided by IFRS accounts. Historical volatility of operating cash flows (i.e. $\sigma OCF_{j,T-6\ to\ T-1}$) and changes in working capital accruals ($\sigma \Delta WCA_{j,T-6\ to\ T-1}$) are measured as the five year standard deviation of operating cash flow per share and changes in working capital per share, ending with the forecast year. Changes in working capital accruals are the net changes in accounts receivable, inventory and payables. Positive coefficients are predicted for both variables since a greater variability in historical operating cash flows or accruals will lead to reduced accuracy of analyst forecasts (Hodder *et al.*, 2008). $MIXED_{j,T-1}$ is a control variable equal to 1 if the sign for net operating cash flows is different to the sign for the changes in working capital accruals. Hodder *et al.* (2008) observe that analyst forecast errors increase when firms using indirect cash flow statements report changes in working capital of a different sign to net operating cash flows. Since all firms in the sample use direct cash flow statements, this reconciliation is performed as part of the notes to the accounts.

$MIXED_{j,T-1}$ is therefore included as a control variable, although the coefficient is anticipated to be insignificant, as Australian analysts are likely to find the information from the face of the direct cash flow statement more useful than the information from the indirect reconciliation, which is reported as part of the notes to the cash flow statement, when forecasting cash flows.[49]

Forecasting cash outflows are more difficult than forecasting cash inflows, therefore $NEGOCF_{j,T-1}$ is a dummy variable, which equals 1 if the forecast year's operating cash flows are negative and 0 otherwise. A positive coefficient is predicted for $NEGOCF_{j,T-1}$ as analysts forecast errors are expected to be greater when historical operating cash flows are negative (Hodder *et al.*, 2008). The natural logarithm of the firm's market capitalisation in the forecast year is also included as a control for variation in firm size ($SIZE_{j,T-1}$) across the sample (Gu and Wu, 2003). Since firm size could reduce or increase analysts forecast error, no sign is predicted for this variable (Hodder *et al.*, 2008). Following Hodder *et al.* (2008) the model also controls for firm growth ($GROWTH_{j,T-1}$) and profitability ($PROFITABILITY_{j,T-1}$), for which the direction of the coefficient is not predicted since they could either increase or decrease forecast error. $GROWTH_{j,T-1}$ is calculated as the annual percentage change in total revenue, averaged over the five years ending with the forecast year, whilst $PROFITABILITY_{j,T-1}$ is calculated by dividing income before extraordinary items by total revenue, also averaged over the five years ending with the forecast year. Analyst following ($NANAL_{j,T-1}$) may also be associated with analyst forecast errors (Gu and Wu, 2003).

[49] Results, presented later in this chapter, confirm that $MIXED_{j,T-1}$ is indeed insignificant across all the regressions.

$NANAL_{j,T-1}$, therefore, is measured as the natural logarithm of the number of annual analyst forecasts made eight months prior to the forecast year. No sign is predicted for $NANAL_{j,T-1}$ since increased analyst following may lead to more aggressive forecasts, or may merely be a function of the increased size of the firms followed (Gu and Wu, 2003). Dechow *et al.* (1998) and Barth *et al.* (2001b) both demonstrate the importance of controlling for the length of the firms operating cycle when forecasting cash flows. Accordingly, $OP\_CYCLE_{j,t-1}$ is used to control for the length of the cash operating cycle following Dechow (1994) as $\{(AR_T + AR_{T-1}) \div 2REV_T + (INV_T + INV_{T-1}) \div 2REV_T\}$, where *AR* is accounts receivables, *INV* is inventory, and *REV* is total revenue for the year, averaged over the five years ending with the forecast year. In line with Hodder *et al.* (2008), a positive coefficient is predicted for $OP\_CYCLE_{j,T-1}$ since long operating cash cycles will lead to higher prediction errors. Finally, industry dummies, $INDUSTRY_{j,T-1}$, are included to control for systematic differences between the six major industry groups represented within the sample.

6.3.4 Sample Selection

Using DataStream, an initial sample of 652 firms was collected, representing companies listed on the Australian Stock Exchange (ASX) 300 index between the years 2000-2010. From this list, financial, utilities and extractive firms, firms with a primary listing other

than the ASX, and firms missing key financial information are removed.[50] Further, all firms are removed that subsequently chose to report their cash flows under the indirect method.[51] From this sample a further 82 firms are removed due to missing or incomplete analyst data from Thomson Reuters I/B/E/S.[52] Next, all firms are removed that have less than three analysts following them during the sample period. Finally, 93 firms are removed due to missing forecasts in either of the two years before or two years after IFRS adoption. The final sample of 78 firms is shown in Table 6-1 Panel A. Financial data used for the final sample of firms was obtained from the Aspect Huntley database, which provides a detailed breakdown of the direct cash flows that are otherwise unavailable elsewhere.

Table 6-1, Panel B, presents the distribution of the sample by industry classification and firm-year across the sample period of eleven years from 2000-2010. It reveals that firm numbers in all industry groups reach their peak around the transition of IFRS between 2004 and 2005 due to the restriction placed on the sample that firms should have forecasts in either of the two years before and two years after IFRS adoption. The sample is dominated by two industry groups, consumer goods and services and industrials, which, when combined, comprise 77% of firms.

[50] Financial and utility firms are removed because of their different reporting requirements and foreign domiciled firms are excluded, as they do not follow Australian GAAP. Of the few studies examining the usefulness of direct cash flows in Australia, Clinch *et al.*(2002) specifically treat mining firms separately for their analysis whilst Arthur *et al.* (2010) exclude such firms. Extractive firms are excluded for analysis in this chapter due to their unique line of business, which is often characterised by long periods of cash outflow with little or no cash inflow. Furthermore, the lack of I/B/E/S data for extractive firms (only 12 extractive firms met the minimum data requirements) did not allow them to be treated separately for analysis within this chapter.

[51] Australian firms were first permitted a choice between reporting their operating cash flows using the direct or indirect method in April 2007 when the AASB amended AASB 107 by issuing AASB Amendment Pronouncement (AP) 2007-4.

[52] Examples include missing cash flow forecasts, missing number of analyst following, and missing actual cash flow per share per I/B/E/S.

Table 6-1 Sample selection and distribution

Panel A: Sampling process

	Total Firms
Initial sample of firms identified on the ASX300 index for fiscal years from 2000 to 2010	652
Less: Foreign with a primary listing other than the ASX	(17)
Less: Financial firms	(137)
Less: Utility firms	(14)
Less: Extractive firms	(181)
Less: Firms switching to the indirect method of reporting cash flows	(5)
Less: Firms with missing financial data requirements	(13)
Less: Firms with missing I/B/E/S data requirements during the sample period	(82)
Less: Firms with consistently only one or two analysts following during the sample period	(32)
Less: Firms missing I/B/E/S CPS forecasts within either two years pre or two years post-IFRS	(93)
Sample used in Equations (6.1)-(6.4)	78
Less: Firms missing 5 years of historical data required for Equation (6.6)	(3)
Sample used in Equation (6.6)	75

Table 6-1 (continued)

Panel B: Sample distribution by industry sector and fiscal year

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Firm Years	Total Firms
Basic materials	1	3	4	4	5	5	4	5	5	5	3	44	5
Consumer goods and services	20	18	29	30	34	33	26	27	23	20	17	277	34
Healthcare	5	3	7	6	9	9	9	7	7	7	7	76	9
Industrials	15	13	24	21	25	25	20	22	20	18	17	220	26
Technology	0	0	3	2	3	3	3	2	1	2	0	19	3
Telecommunications	1	1	1	1	1	1	1	1	1	1	1	11	1
Sample used in Equations (6.1)-(6.4)	42	38	68	64	77	76	63	64	57	53	45	647	78
Firms missing 5 years of historical data	(16)	(9)	(25)	(18)	(20)	(12)	(4)	(4)	(3)	(1)	(1)	(113)	(3)
Sample used in Equation (6.6)	26	29	43	46	57	64	59	60	54	52	44	534	75

6.4 Results

6.4.1 Descriptive Statistics of Variables Used in Equations (6.1) to (6.4)

Table 6-2 provides descriptive statistics and correlation matrix for the key variables used to investigate analysts' use of direct cash flow components when preparing their annual cash flow predictions. Further, this sample is also used to examine the change in usefulness of direct cash flow components by analysts preparing annual cash flow predictions since the adoption of IFRS. Table 6-2, Panel A, presents the descriptive statistics for analysts' median consensus annual cash flow forecast per share (*For_OCF*) issued four months after the financial year-end as per I/B/E/S. Further, it provides descriptive statistics of the direct cash flow components found in the operating section of a direct cash flow statement. These include cash receipts from customers (*CSHRC*), cash payments to suppliers and employees (*CSHPS*), interest paid (*INTP*), net taxes paid (*TXP*), and the net of all other operating cash flows (*CSHOTH*), which, when all aggregated, sum up to net operating cash flows (*OCF*). Table 6-2, Panel A, further provides descriptive statistics for both 'core' (*Core_OCF*) and 'non-core' (*NCore_OCF*) direct cash flows, defined as the net of *CSHRC* and *CSHPS*, and the difference between *OCF* and *Core_OCF* respectively. Finally, statistics for the changes in working capital accruals (*ΔWCapital*), changes in other operating assets and liabilities (*ΔOthOpA&L*), depreciation and amortisation *(DepAmort)*, and other operating accruals *(OthAcc)* are included. All variables are deflated by the issued number of ordinary shares at the financial year-end.

Table 6-2 Descriptive statistics of variables used in the regression analysis examining analysts' use of direct cash flow components when forecasting cash flows

Panel A: Distributional statistics for regression variables

	All observations (647 firm-years)			Pre-IFRS sample (289 firm-years)			Post-IFRS sample (358 firm-years)		
Variable	Mean	Med	SD	Mean	Med	SD	Mean	Med	SD
For_OCF	0.671	0.459	0.621	0.547	0.399	0.422	0.772	0.515	0.728
OCF	0.639	0.422	0.678	0.534	0.363	0.503	0.723	0.471	0.782
CSHRC	8.165	5.454	8.841	6.916	4.955	7.071	9.172	6.093	9.941
CSHPS	(7.227)	(4.593)	8.272	(6.164)	(4.126)	6.699	(8.085)	(5.062)	9.272
Core_OCF	0.938	0.626	1.159	0.752	0.536	0.665	1.087	0.702	1.422
INTP	(0.120)	(0.085)	0.117	(0.099)	(0.067)	0.095	(0.137)	(0.094)	0.129
TXP	(0.153)	(0.108)	0.169	(0.119)	(0.098)	0.103	(0.181)	(0.113)	0.204
CSHOTH	(0.026)	0.013	0.775	(0.000)	0.011	0.217	(0.047)	0.015	1.023
NCore_OCF	(0.299)	(0.179)	0.814	(0.218)	(0.156)	0.283	(0.365)	(0.201)	1.061
ΔWCapital	0.019	0.007	0.293	0.017	0.004	0.224	0.021	0.009	0.338
ΔOthOpA&L	0.031	0.000	0.207	0.018	0.000	0.179	0.041	0.002	0.226
DepAmort	(0.258)	(0.165)	0.300	(0.255)	(0.157)	0.303	(0.261)	(0.169)	0.299
OthAcc	(0.015)	0.002	0.212	(0.004)	0.005	0.173	(0.024)	(0.001)	0.238

Table 6-2 (continued)

Panel B: Spearman (below the diagonal) and Pearson (above the diagonal) correlations (n=647)

	For_OCF	OCF	CSHRC	CSHPS	Core _OCF	INTP	TXP	CSHOTH	NCore _OCF	ΔWCapital	ΔOthOpA&L	DepAmort	OthAcc
For_OCF		0.744	0.685	-0.648	0.597	-0.442	-0.717	-0.018‡	-0.230	0.085	0.326	-0.601	-0.369
OCF	0.774		0.655	-0.598	0.725	-0.453	-0.676	0.006‡	-0.200	-0.307	0.265	-0.697	-0.365
CSHRC	0.687	0.656		-0.993	0.541	-0.408	-0.583	-0.047‡	-0.224	-0.013‡	0.228	-0.603	-0.227
CSHPS	-0.629	-0.586	-0.989		-0.438	0.379	0.539	-0.044‡	0.125	-0.009‡	-0.215	0.574	0.207
Core_OCF	0.810	0.964	0.687	-0.608		-0.409	-0.601	-0.668	-0.819	-0.163	0.206	-0.504	-0.254
INTP	-0.438	-0.424	-0.373	0.335	-0.519		0.373	-0.017‡	0.205	-0.059‡	-0.178	0.515	0.063‡
TXP	-0.677	-0.656	-0.538	0.480	-0.744	0.299		0.032‡	0.292	-0.079	-0.284	0.448	0.237
CSHOTH	0.228	0.251	0.159	-0.172	0.163	-0.319	-0.119		0.956	0.001‡	0.014‡	-0.032‡	-0.001‡
NCore_OCF	-0.660	-0.621	-0.559	0.492	-0.787	0.631	0.795	0.031‡		-0.024‡	-0.071‡	0.136	0.057‡
ΔWCapital	0.029‡	-0.218	-0.030‡	0.011‡	-0.137	-0.010‡	-0.111	-0.058‡	-0.102		-0.107	-0.010‡	-0.107
ΔOthOpA&L	0.003‡	-0.050‡	-0.044‡	0.042‡	-0.029‡	-0.005‡	-0.028‡	-0.018‡	-0.032‡	-0.158		-0.421	-0.516
DepAmort	-0.702	-0.739	-0.668	0.627	-0.756	0.564	0.483	-0.252	0.564	0.052‡	0.013‡		0.218
OthAcc	-0.050‡	-0.133	0.061‡	-0.079	-0.089	-0.102	-0.045‡	-0.046‡	-0.061‡	-0.055‡	-0.254	-0.044‡	

The sample consists of 78 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. In Panel B, insignificant correlations (two tailed p-value < 0.05), are shown by ‡.

Table 6-2 (continued)

Variable Definitions:		
For_OCF	=	analysts' median consensus annual cash flow forecast per share made four months after the prior financial year-end as per I/B/E/S;
OCF	=	net operating cash flow for the year, standardised by the issued number of ordinary shares at the financial year-end;
CSHRC	=	cash receipts from customers, standardised by the issued number of ordinary shares at the financial year-end;
CSHPS	=	cash payments to suppliers and employees, standardised by the issued number of ordinary shares at the financial year-end;
Core_OCF	=	'core' operating cash flows calculated as net *CSHRC* and *CSHPS*, standardised by the issued number of ordinary shares at the financial year-end;
INTP	=	interest paid, standardised by the issued number of ordinary shares at the financial year-end;
TXP	=	net taxes paid or tax refunds received, standardised by the issued number of ordinary shares at the financial year-end;
CSHOTH	=	all other operating cash flows, standardised by the issued number of ordinary shares at the financial year-end;
NCore_OCF	=	'non-core' operating cash flows calculated as the difference between *OCF* and *Core_OCF*
ΔWCapital	=	net change in working capital accruals calculated as the sum of changes in accounts receivable and changes in inventory less the sum of changes in accounts payable and taxation payable, as reported in the reconciliation of earnings to operating cash flows as part of the notes to the cash flow statement, standardised by the issued number of ordinary shares at the financial year-end;
ΔOthOpA&L	=	net change in other operating assets and liabilities, as reported in the reconciliation of earnings to operating cash flows as part of the notes to the cash flow statement, standardised by the issued number of ordinary shares at the financial year-end;
DepAmort	=	sum of depreciation and amortisation, standardised by the issued number of ordinary shares at the financial year-end;
OthAcc	=	other accruals calculated as earnings after taxation before extraordinary items minus *OCF* – (ΔWCapital + ΔOthOpA&L + DepAmort) , standardised by the issued number of ordinary shares at the financial year-end*;*

Columns 2 through 4 of Table 6-2, Panel A, present the mean, median and standard deviation for all variables pooled from January 2000 to December 2010 and used in Equations (6.1) to (6.4) to investigate the first hypothesis. Means, medians and standard deviations for the same variables used to examine the change in usefulness of direct cash flow components post-IFRS are tabulated in the remaining six columns. The mean/(median) of *For_OCF* is 0.671/(0.459), which is positively skewed and similar in magnitude to the mean/(median) of *OCF* of 0.639/(0.422) respectively. All remaining variables in the pooled sample are also positively skewed, consistent with the sample containing a small number of relatively large companies. Columns 5 through 10 of Panel A provide a comparison between the sample means, medians and standard deviations before and after the adoption of IFRS. The mean/(median) of *For_OCF* increased by 41%/(29%) and, along with all other variables, remain positively skewed in both the pre and post-IFRS adoption periods. Further, with the exception of median *OthAcc*, the means, medians and standard deviations of all the remaining variables increased post-IFRS adoption.

The correlation matrix of key variables as tabulated in Table 6-2, Panel B, reveal positive correlations between *OCF* and *CORE_OCF* (Spearman Correlation = 0.774 and 0.810 respectively). These relations are expected if analysts use the information from historical cash flow statements to forecast next year's cash flows. Moreover, the significant relationship between *Core_OCF* and *For_OCF* provides initial evidence that analysts use information from direct cash flow statements when predicting next year's cash flows. *CSHRC* and *CSHPS* are highly correlated (Spearman Correlation = 0.989) which is consistent with similar correlation results reported by Clinch *et al.* (2002). Finally, a significant positive relationship is shown between *OCF* and *Core_OCF*

(Spearman Correlation = 0.964), providing further impetus to treat *Core_OCF* as a separate explanatory variable in Equation (6.2).

6.4.2 Descriptive Statistics of Variables Used in Equation (6.6)

Table 6-3 presents the descriptive statistics for the sample used to investigate the change in analysts' cash flow forecast errors since the adoption of IFRS. Three firms and 113 firm-year observations were excluded from the final sample presented in Table 6-1 due to the strict limitation imposed by calculating the five-year historical averages and standard deviations for some of the key variables used in Equation (6.6). Columns 2 through 6 present the means, standard deviation, medians, and quartiles for the key variables used in Equation (6.6). Pre and post-IFRS period medians and means for the same variables are separately presented in columns 7 to 10, along with results from the univariate tests examining the equality of means between both periods.

The mean absolute value of the analysts' cash flow forecast error (*AFE*) standardised by the average share price is 0.046, more than twice the median of 0.017, revealing a large proportion of firms with relatively small forecast errors. These statistics are consistent with those documented by Hodder *et al.* (2008) which report a mean/(median) *AFE* of 0.036/(0.017) respectively for their sample of U.S. firms. With the exception of the logarithmic number of analysts forecasting future cash flows (*NANAL*) of 1.781, the remaining variables are all positively skewed. Historical operating cash flows (*OCF*) are comparatively more volatile than changes in historical working capital accruals (*ΔWCA*), evidenced by the higher average five-year standard deviation of 0.222 for OCF compared to 0.181 for *ΔWCA*.

Table 6-3 Descriptive statistics of variables used in the regression analysis examining the effect of mandatory IFRS adoption on analysts cash flow forecast errors

	All observations					Medians by Group		Means by Group	
Variable	Mean	Std. Dev	Q1	Median	Q3	Pre-IFRS	Post-IFRS	Pre-IFRS	Post-IFRS
AFE_T	0.046	0.108	0.007	0.017	0.041	0.022	0.016	0.067	0.032***
$\sigma OCF_{T\text{-}6 \text{ to } T\text{-}1}$	0.213	0.222	0.076	0.132	0.243	0.143	0.124	0.200	0.221
$\sigma \Delta WCA_{T\text{-}6 \text{ to } T\text{-}1}$	0.163	0.181	0.052	0.097	0.185	0.102	0.095	0.158	0.167
$MIXED_{T\text{-}1}$	0.453	0.498	0.000	0.000	1.000	0.000	0.000	0.473	0.441
$NEGOCF_{T\text{-}1}$	0.022	0.148	0.000	0.000	0.000	0.000	0.000	0.035	0.015
$SIZE_{T\text{-}1}$	21.083	1.295	20.070	21.008	21.978	20.580	21.188	20.778	21.267***
$GROWTH_{T\text{-}1}$	0.214	0.723	0.049	0.132	0.242	0.135	0.130	0.298	0.164**
$PROFITABILITY_{T\text{-}1}$	0.072	0.064	0.032	0.059	0.103	0.050	0.069	0.066	0.075*
$NANAL_{T\text{-}1}$	1.781	0.338	1.609	1.792	2.079	1.946	1.792	1.854	1.738***
$OP\_CYCLE_{T\text{-}1}$	0.219	0.141	0.129	0.193	0.280	0.191	0.194	0.228	0.214
n	534	534	534	534	534	201	333	201	333
	100.0%	100.0%	100.0%	100.0%	100.0%	37.6%	62.4%	37.6%	62.4%

The above sample consists of 75 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. ***. **.* Differences across groups are significant (two-tailed). P-value $p<0.01$, $p<0.05$, $p<0.1$ levels of significance respectively.

Table 6-3 (continued)

Variable Definitions:

AFE_T	=	absolute value of the analysts' cash flow forecast error standardised by the eight-month average share price between the forecast date and the financial year-end. Cash flow forecast error is calculated as the difference between the actual cash flow per share as reported by I/B/E/S and the analysts' median consensus forecast per share made four months after the prior financial year-end;
$\sigma OCF_{T-6 \text{ to } T-1}$	=	standard deviation of annual operating cash flows, standardised by the issued number of ordinary shares at the financial year-end, for the five years ending with the forecast year;
$\sigma \Delta WCA_{T-6 \text{ to } T-1}$	=	standard deviation of the change in working capital accruals, standardised by the issued number of ordinary shares at the financial year-end, for the five years ending with the forecast year. Change in working capital accruals are measured as the net annual change in accounts receivable, inventory and payables;
$MIXED_{T-1}$	=	dummy variable equal to 1 if the signs on operating cash flows are different to the sign on the change in working capital accruals;
$NEGOCF_{T-1}$	=	dummy variable equal to 1 if the forecast year's operating cash flows are negative, and 0 otherwise;
$SIZE_{T-1}$	=	natural logarithm of the firms market capitalisation in the forecast year;
$GROWTH_{T-1}$	=	annual percentage change in total revenue, averaged over the five years ending with the forecast year;
$PROFITABILITY_{T-1}$	=	income before extraordinary items divided by total revenue, averaged over the five years ending with the forecast year;
$NANAL_{T-1}$	=	natural logarithm of the number of analyst forecasts in the forecast year;
OP_CYCLE_{T-1}	=	operating cycle, calculated by following Dechow (1994) as the sum of average receivables divided by total revenue and average inventory divided by total revenue, averaged over the five years ending with the forecast year;

Approximately 45% of firms reveal mixed signs between *OCF* and *ΔWCA*, while only 2% of firms report negative operating cash flows. This is likely because the sample only includes firms that were historically represented in the 300 largest firms in Australia where reporting negative operating cash flows would be uncommon. Hence, the average firm size of 21.083, calculated as the logarithm of market capitalisation, is relatively larger than the 8.213 value reported from the wider U.S. sample used by Hodder *et al.* (2008). Five-year average revenue growth, profitability, and operating cycle over the eleven-year period were approximately 21%, 7%, and 80 days respectively.

Univariate tests of comparisons between the pre and post-IFRS periods reveal some significant changes in the means for a number of the key variables. Specifically, a 52% decline is observed in the mean absolute value of analysts cash flow forecast error to 0.032 post-IFRS, providing initial evidence that the accuracy of cash flow forecasts significantly improved subsequent to the adoption of IFRS. The mean logarithm of market capitalisation increased by more than 2%, which univariate tests indicate is a significant growth in firm size post-IFRS. However, mean revenue growth nearly halved from 30% to 16%, a decline of 47%. On average firms were marginally more profitable post-IFRS, reporting a net profit margin of 7.5%, up 14% from 6.6% in the pre-IFRS period. There was also a significant fall in the average number of analysts issuing annual cash flow forecasts post-IFRS. Finally, a comparison between the medians and means in columns 7 to 10 reveal that all variables, with the exception of *NANAL*, remain positively skewed both before and after IFRS.

6.4.3 IFRS Adoption and Analysts' Use of Direct Cash Flow Components

Investigating the first hypotheses, Table 6-4 to 6-7 summarise the results for estimating Equations (6.1) to (6.4) on a pooled basis, before and after the adoption of IFRS in Australia. All variables are analysed on a per share basis. The tables report mean coefficients, two tailed *t*-statistics, and adjusted R^2 values for the pooled sample (from January 2000 to December 2010), pre-IFRS (from January 2000 to December 2004), post-IFRS (from January 2005 to December 2010), and pre vs. post-IFRS respectively. Results from columns 1 to 3 are used to test the first hypothesis of whether analysts find information from direct cash flow statements useful when predicting future cash flows. Interactive dummy variables used in column 4 of each table test whether analysts find information from direct cash flow statements significantly more useful after adopting IFRS.

6.4.3.1 Usefulness of Aggregate Historical Operating Cash Flows

Table 6-4 presents results from the benchmark Equation (6.1) by testing analysts' use of aggregate operating cash flows and accruals components, prior to disaggregating cash flows into their components in the subsequent tables. The cash flow coefficients are positive and significant in columns 1 to 3 providing evidence that analysts find information regarding historical cash flows useful when predicting next year's cash flows, and this holds both before and after the adoption of IFRS. Columns 1 to 3 further reveal *ΔWCapital, ΔOthOpA&L,* and *OthAcc* are also significant, while *DepAmort* is significant for the pooled and pre-IFRS regressions only. These findings further justify the inclusion of these accruals components as controls within each model since they show analysts also find information regarding historical accrual components useful when forecasting future cash flows.

Table 6-4 Comparing analysts' use of operating cash flows and accruals when forecasting future cash flows before and after the adoption of IFRS

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 OCF_{j,t} + \beta_2 \Delta WCapital_{j,t} + \beta_3 \Delta OthOpA\&L_{j,t} + \beta_4 DepAmort_{j,t} + \beta_5 OthAcc_{j,t} + \sum_j^6 \beta_{6j} INDUSTRY_{j,t} + \varepsilon_{j,t}$$

Variable	Column (1) Pooled	Column (2) Pre-IFRS	Column (3) Post-IFRS	Column (4) Pre vs. Post
Intercept	-0.014	0.171	0.012	0.191***
	(0.813)	(0.197)	(0.814)	(0.006)
OCF	1.068***	0.893***	1.052***	0.824***
	(0.000)	(0.000)	(0.000)	(0.000)
ΔWCapital	1.000***	0.511***	1.080***	0.474***
	(0.000)	(0.003)	(0.000)	(0.005)
ΔOthOpA&L	0.876***	0.665***	0.703***	0.599***
	(0.000)	(0.000)	(0.000)	(0.001)
DepAmort	0.253***	0.481**	0.094	0.420*
	(0.003)	(0.037)	(0.269)	(0.057)
OthAcc	0.809***	0.360*	0.761***	0.140
	(0.000)	(0.077)	(0.000)	(0.518)
D_Intercept				-0.155***
				(0.000)
D_OCF				0.237*
				(0.076)
D_ΔWCapital				0.611***
				(0.001)
D_ΔOthOpA&L				0.100
				(0.640)
D_DepAmort				-0.291
				(0.208)
D_OthAcc				0.616**
				(0.016)
Industry dummies	Yes	Yes	Yes	Yes
n	630	281	348	631
Adjusted R^2	0.893	0.686	0.941	0.885

"Pooled" regressions include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. *"Pre vs. Post"* are pooled regressions, which include interactive dummy variables to investigate the change in significance of the explanatory variables after the adoption of IFRS. When estimating the coefficients' standard errors, a White (1980) procedure is used to correct for heteroskedasticity. Variable definitions are as reported in Table 6-2. Dummy variables are prefixed by *"D"*, taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The results from column 4 further show a significant positive mean coefficient for *ΔWCapital* and *OthAcc* dummy variables of 0.611 and 0.616 respectively, a result that remains consistent for Table 6-5 to 6-7. Further, operating cash flows are shown to increase in usefulness, evidenced by the coefficient of 0.237 for the *OCF* dummy variable, revealing financial analysts' find historical operating cash flows, changes in working capital accruals and other accruals more useful when forecasting future cash flows under IFRS. In summary, historical operating cash flows, working capital accruals and other accruals are not only used by financial analysts, but are significantly more useful to financial analysts post-IFRS, when predicting next year's cash flows.

6.4.3.2 Usefulness of 'Core' and 'Non-core' Direct Cash Flows

Following Cheng and Hollie (2008), *OCF* is disaggregated into 'core' (*Core_OCF*) and 'non-core' (*NCore_OCF*) direct cash flows in Equation (6.2), with the results reported in Table 6-5. Consistent with H1, the mean coefficients for both *Core_OCF* and *NCore_OCF* are positive and highly significant under local GAAP and IFRS, and across the pooled sample period. Further, the mean coefficients for *ΔWCapital* and *OthAcc* remain positive and highly significant under AGAAP and IFRS. Coefficients for *DepAmort* are significant for the pooled regression and pre-IFRS, and the coefficients for *ΔOthOpA&L* are significant post-IFRS and for the pooled regression. Net cash receipts from customers and payments to suppliers and employees, information only available from direct cash flow statements, is clearly useful to financial analysts when predicting annual cash flows.

Table 6-5 Comparing analysts' use of 'core' operating cash flows and accruals when forecasting future cash flows before and after the adoption of IFRS

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 Core\_OCF_{j,t} + \beta_2 NCore\_OCF_{j,t} + \beta_3 \Delta WCapital_{j,t} + \beta_4 \Delta OthOpA\&L_{j,t} + \beta_5 DepAmort_{j,t} + \beta_6 OthAcc_{j,t} + \sum_{j}^{6} \beta_{7j} INDUSTRY_{j,t} + \varepsilon_{j,t}$$

Variable	Column (1) Pooled	Column (2) Pre-IFRS	Column (3) Post-IFRS	Column (4) Pre vs. Post
Intercept	-0.003	0.270**	0.012	0.181***
	(0.955)	(0.040)	(0.823)	(0.006)
Core_OCF	1.046***	0.814***	1.046***	0.748***
	(0.000)	(0.000)	(0.000)	(0.000)
NCore_OCF	1.031***	0.628***	1.034***	0.567***
	(0.000)	(0.000)	(0.000)	(0.001)
ΔWCapital	0.961***	0.427**	1.076***	0.354**
	(0.000)	(0.012)	(0.000)	(0.047)
ΔOthOpA&L	0.852***	0.615***	0.697***	0.489***
	(0.000)	(0.000)	(0.000)	(0.009)
DepAmort	0.229***	0.509***	0.091	0.375*
	(0.006)	(0.006)	(0.287)	(0.079)
OthAcc	0.762***	0.209	0.753***	0.104
	(0.000)	(0.321)	(0.000)	(0.632)
D_Intercept				-0.145***
				(0.000)
D_Core_OCF				0.306**
				(0.030)
D_NCore_OCF				0.474***
				(0.005)
D_ΔWCapital				0.726***
				(0.000)
D_ΔOthOpA&L				0.203
				(0.350)
D_DepAmort				-0.252
				(0.262)
D_OthAcc				0.645**
				(0.012)
Industry dummies	Yes	Yes	Yes	Yes
n	629	281	348	630
Adjusted R^2	0.891	0.703	0.941	0.892

"Pooled" regressions include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. *"Pre vs. Post"* are pooled regressions, which include interactive dummy variables to investigate the change in significance of the explanatory variables after the adoption of IFRS. When estimating the coefficients' standard errors, a White (1980) procedure is used to correct for heteroskedasticity. Variable definitions are as reported in Table 6-2. Dummy variables are prefixed by *"D"*, taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Moreover, consistent with H1b, the mean coefficients for the dummy variables in column 4 show significant positive mean coefficients for both direct cash flow variables. As predicted, financial analysts' not only find 'core' and 'non-core' direct cash flow information useful when forecasting annual cash flows, but they find this information more useful subsequent to the adoption of IFRS.

6.4.3.3 Usefulness of Direct Cash Flow Components

Disaggregating 'core' direct cash flows into their components of cash receipts from customers (*CSHRC*) and cash payments to suppliers and employees (*CSHPS*), Table 6-6 provides consistent results with H1 and H1b. The mean coefficients of *CSHRC* and *CSHPS* are positive and significant under local GAAP and IFRS, and increase significantly post-IFRS. Analysts' not only find 'core' direct cash flows useful when forecasting annual cash flows, they also find information regarding *CSHRC* and *CSHPS* useful when determining their predictions. Moreover, analysts find direct cash flow components significantly more useful post-IFRS.

Table 6-6 Comparing analysts' use of direct operating cash flows, 'non-core' operating cash flows and accruals when forecasting future cash flows before and after the adoption of IFRS

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 CSHRC_{j,t} + \beta_2 CSHPS_{j,t} + \beta_3 NCore\_OCF_{j,t} + \beta_4 \Delta WCapital_{j,t} + \beta_5 \Delta OthOpA\&L_{j,t} + \beta_6 DepAmort_{j,t} + \beta_7 OthAcc_{j,t} + \sum_{j}^{6} \beta_{8j} INDUSTRY_{j,t} + \varepsilon_{j,t}$$

Variable	Column (1) Pooled	Column (2) Pre-IFRS	Column (3) Post-IFRS	Column (4) Pre vs. Post
Intercept	-0.019	0.135	0.003	0.137**
	(0.736)	(0.251)	(0.947)	(0.019)
CSHRC	1.021***	0.697***	1.005***	0.662***
	(0.000)	(0.000)	(0.000)	(0.000)
CSHPS	1.014***	0.682***	1.000***	0.648***
	(0.000)	(0.000)	(0.000)	(0.000)
NCore_OCF	1.002***	0.499***	0.992***	0.460***
	(0.000)	(0.003)	(0.000)	(0.006)
ΔWCapital	0.983***	0.346**	1.043***	0.335**
	(0.000)	(0.045)	(0.000)	(0.049)
ΔOthOpA&L	0.724***	0.486***	0.677***	0.437**
	(0.000)	(0.007)	(0.000)	(0.012)
DepAmort	0.344***	0.454**	0.139*	0.386*
	(0.001)	(0.018)	(0.095)	(0.051)
OthAcc	0.709***	0.250	0.703***	0.182
	(0.000)	(0.243)	(0.000)	(0.379)
D_Intercept				-0.113***
				(0.000)
D_CSHRC				0.332**
				(0.019)
D_CSHPS				0.340**
				(0.018)
D_NCore_OCF				0.518***
				(0.002)
D_ΔWCapital				0.724***
				(0.000)
D_ΔOthOpA&L				0.230
				(0.261)
D_DepAmort				-0.229
				(0.278)
D_OthAcc				0.485**
				(0.050)
Industry dummies	Yes	Yes	Yes	Yes
n	628	280	348	627
Adjusted R^2	0.899	0.742	0.944	0.906

Table 6-6 (continued)

"Pooled" regressions include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. *"Pre vs. Post"* are pooled regressions, which include interactive dummy variables to investigate the change in significance of the explanatory variables after the adoption of IFRS. When estimating the coefficients' standard errors, a White (1980) procedure is used to correct for heteroskedasticity. Variable definitions are as reported in Table 6-2. Dummy variables are prefixed by *"D"*, taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Presenting results from Equation (6.4), Table 6-7 provides consistent support for the first hypotheses. The mean coefficients for *CSHRC* and *CSHPS* remain significantly positive pre and post-IFRS and continue to show a significant increase in significance post-IFRS. Further, Table 6-7 provides evidence that disaggregating *NCore_OCF* into the components of interest paid (*INTP*), net taxes received or paid (*TXP*) and other operating cash flows (*CSHOTH*) provide analysts with useful information post-IFRS. However, pre-IFRS *TXP, ΔWCapital, DepAmort* and *OthAcc* are insignificant. Other than the change in the mean coefficient for *INTP*, column 4 provides strong support for H1b by showing a significant improvement in the usefulness of direct cash flow components and aggregate accruals since the adoption of IFRS. In summary, these findings show financial analysts' do use 'core' direct cash flow components when forecasting cash flows, and that the usefulness of this information significantly increases post-IFRS.

Table 6-7 Comparing analysts' use of direct operating cash flow components and accruals when forecasting future cash flows before and after the adoption of IFRS

$$For\_OCF_{t+4} = \beta_0 + \beta_1 CSHRC_t + \beta_2 CSHPS_t + \beta_3 INTP_t + \beta_4 TXP_t + \beta_5 CSHOTH_t + \beta_6 \Delta WCapital_{j,t} + \beta_7 \Delta OthOpA\&L_{j,t} + \beta_8 DepAmort_{j,t} + \beta_9 OthAcc_{j,t} + \sum_j^6 \beta_{10j} INDUSTRY_{j,t} + \varepsilon_{j,t}$$

Variable	Column (1) Pooled	Column (2) Pre-IFRS	Column (3) Post-IFRS	Column (4) Pre vs. Post
Intercept	-0.040	0.198*	-0.056	0.119**
	(0.451)	(0.070)	(0.261)	(0.032)
CSHRC	0.925***	0.494***	0.888***	0.510***
	(0.000)	(0.001)	(0.000)	(0.002)
CSHPS	0.919***	0.482***	0.881***	0.497***
	(0.000)	(0.002)	(0.000)	(0.002)
INTP	0.715***	0.493**	0.597***	0.469*
	(0.000)	(0.034)	(0.000)	(0.053)
TXP	0.732***	-0.586	0.794***	-0.312
	(0.000)	(0.144)	(0.000)	(0.459)
CSHOTH	0.911***	0.386**	0.873***	0.395**
	(0.000)	(0.020)	(0.000)	(0.030)
ΔWCapital	0.914***	0.252	1.082***	0.240
	(0.000)	(0.124)	(0.000)	(0.159)
ΔOthOpA&L	0.739***	0.376**	0.493***	0.327*
	(0.000)	(0.018)	(0.002)	(0.073)
DepAmort	0.250**	0.257	0.088	0.210
	(0.011)	(0.215)	(0.481)	(0.363)
OthAcc	0.654***	0.010	0.417**	-0.002
	(0.000)	(0.962)	(0.029)	(0.992)
D_Intercept				-0.115***
				(0.000)
D_CSHRC				0.498***
				(0.003)
D_CSHPS				0.506***
				(0.003)
D_INTP				0.300
				(0.269)
D_TXP				1.357***
				(0.002)
D_CSHOTH				0.599***
				(0.001)
D_ΔWCapital				0.824***
				(0.000)
D_ΔOthOpA&L				0.348
				(0.103)
D_DepAmort				0.008
				(0.974)
D_OthAcc				0.665**
				(0.010)
Industry dummies	Yes	Yes	Yes	Yes
n	629	280	347	628
Adjusted R^2	0.896	0.746	0.941	0.905

Table 6-7 (continued)

"Pooled" regressions include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. *"Pre vs. Post"* are pooled regressions, which include interactive dummy variables to investigate the change in significance of the explanatory variables after the adoption of IFRS. When estimating the coefficients' standard errors, a White (1980) procedure is used to correct for heteroskedasticity. Variable definitions are as reported in Table 6-2. Dummy variables are prefixed by *"D"*, taking on the value of their respective explanatory variable post-IFRS, and zero otherwise. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

6.4.4 IFRS Adoption and Accuracy of Analysts' Cash Flow Forecasts

Having established financial analysts use direct cash flow components when forecasting cash flows, and significantly more so under IFRS, it now remains to examine whether their cash flow forecasts are significantly more accurate post-IFRS, and whether financial analysts, by using direct cash flow components, can significantly improve the accuracy of their cash flow predictions. Coefficient estimates from the ordinary least-squares regression of Equation (6.6), investigating the second hypothesis, are presented in Table 6-8 in columns 1 through 3. Following Hodder *et al.* (2008), standard errors are adjusted to control for firm level clustering over time.

Column 1 displays the primary results and estimated coefficients for the entire sample of firms pooled from January 2000 to December 2010. The intercept is positive and significant (coefficient of 0.273; two-tailed p-value < 0.01). Further, the mean coefficient for the main variable of interest (*IFRS*), which measures the change in analyst cash flow forecast error since the adoption of IFRS is negative and highly significant (coefficient of -0.014; two-tailed p-value < 0.01).

Table 6-8 Effect of mandatory IFRS adoption on analysts' cash flow forecast errors

$$AFE_{j,T} = \beta_0 + \beta_1 IFRS + \beta_2 \sigma OCF_{j,T-6toT-1} + \beta_3 \sigma \Delta WCA_{j,T-6toT-1} + \beta_4 MIXED_{j,T-1} + \beta_5 NEGOCF_{j,T-1} + \beta_6 SIZE_{j,T-1} + \beta_7 GROWTH_{j,T-1} + \beta_8 PROFITABILITY_{j,T-1} + \beta_9 NANAL_{j,T-1} + \beta_{10} OP\_CYCLE_{j,T-1} + \sum_{j}^{6} \beta_{11} INDUSTRY_{j,T-1} + \varepsilon_{j,T}$$

Variable	Expected Sign	Column (1) Pooled	Column (2) Financial Crises	Column (3) All controls
Intercept	n/a	0.273***	0.269***	0.264***
		(0.000)	(0.000)	(0.000)
IFRS	-ve	-0.014***	-0.011**	-0.014**
		(0.008)	(0.038)	(0.019)
$\sigma OCF_{T-6 \text{ to } T-1}$	+ve	0.042**	0.043***	0.042***
		(0.012)	(0.007)	(0.007)
$\sigma DWCA_{T-6 \text{ to } T-1}$	+ve	0.010	0.007	0.007
		(0.626)	(0.717)	(0.701)
$MIXED_{T-1}$	+ve	-0.002	-0.002	-0.002
		(0.473)	(0.636)	(0.600)
$NEGOCF_{T-1}$	+ve	0.027	0.022	0.023
		(0.297)	(0.394)	(0.390)
$SIZE_{T-1}$	?	-0.009***	-0.009***	-0.009***
		(0.000)	(0.000)	(0.000)
$GROWTH_{T-1}$	?	0.020***	0.020***	0.020***
		(0.000)	(0.000)	(0.000)
$PROFITABILITY_{T-1}$	?	-0.057	-0.067	-0.066
		(0.178)	(0.148)	(0.150)
$NANAL_{T-1}$	?	-0.017***	-0.023***	-0.025***
		(0.007)	(0.001)	(0.001)
OP_CYCLE_{T-1}	+ve	-0.017	-0.017	-0.017
		(0.349)	(0.350)	(0.339)
D_CRISIS_02	+ve		0.021**	0.021**
			(0.012)	(0.011)
D_CRISIS_08	+ve		0.015***	0.017***
			(0.000)	(0.000)
D_2005	+ve			0.007*
				(0.091)
Industry dummies		Yes	Yes	Yes
n		525	525	525
Adjusted R^2		0.200	0.225	0.225

All regressions are pooled and include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. Clustered standard errors are used to correct for firm level serial dependence over the sample period. Column (1) provides results from the base model using Equation (6) where IFRS is a dummy variable equal to 1 if the financial year-end is after January 1, 2005, and 0 otherwise. Column (2) includes two additional dummy variables, D_CRISIS_02 and D_CRISIS_08, controlling for analysts' forecasts made during times of the respective stock market crises for the financial years prior to 2002 and after 2007. Column (3) includes a final additional dummy variable, D_2005, controlling for analyst forecasts made for the financial year 2005, the year of IFRS adoption. All remaining variable definitions are as reported in Table 6-2. Two-tailed p-values are presented in

parentheses. *** p<0.01, ** p<0.05, * p<0.1.

These findings are consistent with the prediction and univariate results that analysts' cash flow forecast accuracy improves after the adoption of IFRS. Additionally, $\sigma OCF_{j,T-6\ to\ T-1}$ and $GROWTH_{j,T-1}$ are significant and positively related to analyst forecast errors (coefficients of 0.042 and 0.020; two-tailed p-values < 0.05 and <0.01 respectively), while $SIZE_{j,T-1}$ and $NANAL_{j,T-1}$ are significant and negatively related to analyst forecast errors (coefficients of -0.009 and -0.017; two-tailed p-value < 0.01).

Column 2 re-examines the second hypothesis by controlling for all forecasts made for financial years prior to 2002 and after 2007 to avoid any confounding effects on the results from the 2001 and 2008 market crashes, since analysts forecast errors are expected to increase significantly during times of uncertainty. Consistent with the predictions and previous findings, *IFRS* remains negative and significant in column 2 (coefficients of -0.011; two-tailed p-value < 0.05), while the magnitude and significance of the coefficients for $\sigma OCF_{j,T-6\ to\ T-1}$, $GROWTH_{j,T-1}$, $SIZE_{j,T-1}$ and $NANAL_{j,T-1}$ remain largely similar to those reported in column 1. As expected the coefficients on the two control variables for the market crashes, *D_CRISIS_02* and *D_CRISIS_08*, are positive and significant indicating an increase in analysts cash flow forecast errors during times of significant market volatility.

Finally, following Horton *et al.* (2012), column 3 includes control for all analyst forecasts made for the year of IFRS adoption and presents consistent findings with columns 1 and 2 where *IFRS* remains negative and significant (coefficients of -0.014; two-tailed p-value < 0.05). Results for the remaining control variables are consistent with those in columns 1 and 2 and the control for the year of IFRS adoption is positive and marginally significant (coefficient of 0.007; two-tailed p-value < 0.10). Analyst

cash flow forecast errors marginally increased during the year of IFRS adoption. In summary, these findings provide strong support for the second hypothesis that analysts' cash flow forecast accuracy improves subsequent to the adoption of IFRS. These findings are in line with prior studies that show analysts' earnings forecast accuracy also improves post-IFRS, and supports the view that the adoption of IFRS has significantly improved the quality of information available to financial analysts.

6.4.5 Ranking the Empirical Models

The results so far reveal analysts use net operating cash flows and direct cash flow components to predict cash flows for the entire sample period, finding direct cash flow components more useful under IFRS, and forecasting cash flows more accurately under IFRS. However, it remains to be seen whether the improvement in forecast accuracy under IFRS is due to the increased differential usefulness of direct cash flow components under IFRS. Following Krishnan and Largay III (2000), therefore, Friedman's ANOVA rank tests are used to examine H2b, of whether there is a significant difference between absolute forecast errors calculated for each of Equations (6.1) to (6.4). Table 6-9 reports the Friedman's ANOVA statistics, along with the results of t-tests comparing the average rank and forecast error for each model between the pre and post-IFRS periods.

Table 6-9 Comparing analysts' use of operating cash flow components and accruals by comparing the average ranks of forecast errors generated by each empirical model

	Pooled N = 647		Pre-IFRS N = 289		Post-IFRS N = 358	
Model	Average rank	AFE	Average rank	AFE	Average rank	AFE
(6.1)	2.603	0.0353	2.529	0.0529	2.692*	0.0246***
(6.2)	2.501	0.0350	2.678	0.0534	2.349***	0.0244***
(6.3)	2.505	0.0344	2.343	0.0503	2.391	0.0243***
(6.4)	2.391	0.0342	2.450	0.0510	2.567	0.0269***
Friedman	8.7218		10.3910		16.3810	
S-Statistic	(0.033)		(0.015)		(0.001)	

Where:

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 OCF_{j,t} + \beta_2 \Delta WCapital_{j,t} + \beta_3 \Delta OthOpA\&L_{j,t} + \beta_4 DepAmort_{j,t} + \beta_5 OthAcc_{j,t} + \sum_j^6 \beta_{6j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.1)$$

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 Core\_OCF_{j,t} + \beta_2 NCore\_OCF_{j,t} + \beta_3 \Delta WCapital_{j,t} + \beta_4 \Delta OthOpA\&L_{j,t} + \beta_5 DepAmort_{j,t} + \beta_6 OthAcc_{j,t} + \sum_j^6 \beta_{7j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.2)$$

$$For\_OCF_{j,t+4} = \beta_0 + \beta_1 CSHRC_{j,t} + \beta_2 CSHPS_{j,t} + \beta_3 NCore\_OCF_{j,t} + \beta_4 \Delta WCapital_{j,t} + \beta_5 \Delta OthOpA\&L_{j,t} + \beta_6 DepAmort_{j,t} + \beta_7 OthAcc_{j,t} + \sum_j^6 \beta_{8j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.3)$$

$$For\_OCF_{t+4} = \beta_0 + \beta_1 CSHRC_t + \beta_2 CSHPS_t + \beta_3 INTP_t + \beta_4 TXP_t + \beta_5 CSHOTH_t + \beta_6 \Delta WCapital_{j,t} + \beta_7 \Delta OthOpA\&L_{j,t} + \beta_8 DepAmort_{j,t} + \beta_9 OthAcc_{j,t} + \sum_j^6 \beta_{10j} INDUSTRY_{j,t} + \varepsilon_{j,t} \quad (6.4)$$

"Pooled" regressions include all firms spanning both the pre and post-IFRS period between January 2000 and December 2010. *"Pre-IFRS"* includes all firms with financial years ending up to and including December 31, 2004, whereas *"Post-IFRS"* incorporates all firms with financial years ending on or after January 1, 2005. Average ranks are calculated after using Equations (6.1) to (6.4) to predict next year's cash flows. The absolute forecast error, standardised by the average share price for the eight months between the forecast date and next year's fiscal year-end, is calculated by comparing the models prediction with the analysts' median consensus forecasts. For each firm-year observation, the model yielding the lowest absolute forecast error is given a rank of one, the next model a rank of two, the third model a rank of three, and the model with the highest absolute forecast error a rank of four. The model yielding the lowest average rank is considered the model financial analysts find most useful when forecasting next year's cash flows. Friedman S-statistic is used to test whether the null hypothesis of no difference between the ranked models can be rejected. Variable definitions are as reported in Table 6-2, Panel B.

Using Equations (6.1) to (6.4), next year's cash flows are predicted and compared with the analysts' median consensus forecasts. Then, the absolute, price standardised, forecast error is calculated by using Equation (6.5). For each firm-year observation, the model with the lowest absolute forecast error is ranked as 1, the next model ranked 2, the third model ranked 3, and the model with the highest absolute forecast error ranked 4. The model yielding the lowest average rank will be the model containing the cash flow information financial analysts find most useful when forecasting next year's cash flows.

Consistent with Krishnan and Largay III (2000), Table 6-9 reports the lowest average rank for Equations (6.3) and (6.4), when *OCF* is disaggregated into *CSHRC* and *CSHPS*, on a pooled basis and under local GAAP. However, under IFRS, Equations (6.2) and (6.3) are found to yield the lowest average rank and absolute forecast errors with the average rank of Equation (6.2), using 'core' direct cash flow information, falling significantly post-IFRS. Conversely, the average rank for Equation (6.1), using aggregate operating cash flows, rose marginally in the post-IFRS period. Friedman S-statistics are significant at the 5% level for both the pooled and pre-IFRS periods and at the 1% level post-IFRS.

Taken together, these results imply that analysts consider more information than just aggregate operating cash flows and accruals components when forecasting cash flows. Analysts' clearly find information about the cash receipts from customers and cash payments to suppliers and employees, which can only be found in direct cash flow statements, more useful than aggregate operating cash flows when predicting next year's cash flows. Further, consistent with the earlier findings, analysts cash flow forecast accuracy significantly improves under IFRS. These findings support the

hypothesis that the significant improvement in analysts' cash flow forecasts post-IFRS is significantly associated to the significant increase in the usefulness of direct cash flow components by financial analysts' post-IFRS.

6.5 Discussion and Conclusion

Current FASB and IASB proposals to mandate direct cash flow statements are motivated by the assertion that the direct method provides information, unavailable from the indirect method, which is useful in forecasting cash flows. Prior studies examining this assertion have used random walk models, and find a significant increase in forecast accuracy after including historical direct cash flow components within their models (e.g., Krishnan and Largay III, 2000; Arthur and Chuang, 2008; Cheng and Hollie, 2008; Orpurt and Zang, 2009; Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013). Importantly, however, while these findings complement financial analysts' opinions that direct cash flows provide useful information to forecast future cash flows, to date, no research has empirically examined, when available, if financial analysts actually use this information when forecasting future cash flows. Further, since the adoption of IFRS, after which the quality and comparability of information available to financial analysts significantly improved (Bissessur and Hodgson, 2011; Cotter *et al.*, 2012), no research has examined analysts' use of direct cash flows when predicting future cash flows or the change in analysts' cash flow forecast accuracy.

By mandating the use of direct cash flow statements until 2007, and prohibiting the early voluntary adoption of IFRS, Australia provides an ideal setting to test financial analysts' use of direct cash flow components when forecasting future cash flows under both local GAAP and IFRS, and to compare the change between the two periods. The

results provide strong evidence that financial analysts use information from direct cash flow statements when estimating future cash flows under both local GAAP and IFRS, but more so since the adoption of IFRS. Moreover, they show a strong post-IFRS improvement in the accuracy of analysts' cash flow predictions, which is likely a result of financial analysts finding information about direct cash flow components significantly more useful under IFRS. Taken together, these findings affirm financial analyst's opinions that information from direct cash flow statements is useful when estimating future cash flows, and are consistent with IFRS improving analysts' information environment. By requiring the use of direct cash flow statements, the FASB and IASB would be providing financial analysts with useful information, which in turn would provide investors with more accurate cash flow predictions on which to base their economic decisions.

The final empirical chapter, therefore, examines whether financial analysts use their cash flow forecasts and information from direct cash flow statements as inputs in the process of arriving at their final output, the stock recommendation. Further, chapter 7 examines whether buy-and-hold investors are better able to identify mispriced securities by following the analysts' recommendations or by using analysts' cash flow forecasts in discounted cash flow valuation models.

7
Are Analysts' Cash Flow Forecasts and Direct Cash Flow Statements Essential Inputs to Generate Stock Recommendations?

7.1 Introduction

Prior studies demonstrate that analysts' stock recommendations relate positively to valuation heuristics based on their earnings forecasts, but negatively to future excess stock returns and residual income valuations scaled by current price (Bradshaw, 2004; Barniv *et al.*, 2009, 2010). While these studies validate the use of analysts' earnings forecasts as valuation inputs to identify mispriced securities, the extant literature has, to date, not analysed whether analysts' cash flow forecasts are used in a similar manner. Increasingly, analysts are forecasting both earnings and cash flows, partly in response to increased market demand for price relevant information (DeFond and Hung, 2003). Historical operating cash flows have been found to increase in value relevance for firms where analysts forecast earnings and cash flows compared to those where only earnings are forecast (Call, 2008). Moreover, significant positive market reactions are observed within four days of analysts revising their cash flow forecasts, further demonstrating the value relevant information provided over and above analysts' earnings forecasts (Call *et al.*, 2012). This chapter, therefore, hypothesises that analysts' cash flow forecasts provide analysts and investors with valuable information to identify mispriced securities.

Historical operating cash flows are one of many sources that provide financial analysts with valuable information when forecasting cash flows. Moreover, assessing an entities ability to generate future cash flows is one of the main benefits of preparing a cash flow statement according to International Accounting Standard 7, which states:

> *"Historical cash flow information is often used as an indicator of the amount, timing and certainty of future cash flows."*
>
> *(IASB, 2010, paragraph 5)*

Further, a recent large-scale survey by the Chartered Financial Analysts Institute revealed that most analysts believe direct, rather than indirect, cash flow statements provide useful information for forecasting cash flows. Accordingly, this chapter examines whether historical direct cash flow statements provide financial analysts with valuable information when issuing their stock recommendations.

By using a sample of non-financial Australian companies listed on the ASX300 from 2000-2010, and following Bradshaw (2004), analysts' earnings forecasts are used to construct residual income valuation models and heuristics. Adopting a similar approach to the development of these models, analysts' cash flow forecasts are then used to construct discount cash flow valuation models and heuristics. Analysts' consensus stock recommendations, and future excess stock returns, are then compared to the price standardised values produced by the residual income models, and discounted cash flow models. Further, analysts' stock recommendations, and future excess stock returns, are compared to a number of heuristics based on analysts' earnings, cash flow, and long-term growth forecasts, and heuristics based on historical earnings and cash flows.

Finally, to identify which model best identifies mispriced securities, Vuong (1989) tests are used to compare the explanatory power between the various earnings and cash flow based models.

The findings of this chapter demonstrate that financial analysts do use their cash flow forecasts and historical direct cash flow information when setting stock recommendations. However, analyst stock recommendations relate negatively to future excess stock returns and discount cash flow models scaled by current price. Overall, the results are consistent with the earnings based studies, and demonstrate that buy-and-hold investors are better off using analysts' forecasts in multi-period valuation models to identify mispriced securities compared to following analysts' recommendations. Moreover, in comparison to the profitability of using multi-period earnings valuation techniques, buy-and-hold investors are significantly better off by using analyst cash flow forecasts in discounted cash flow models to identify mispriced securities.

7.2 Background and Hypothesis Development

7.2.1 Analysts' Choice of Valuation Model

There is a substantial literature on the valuation models employed by analysts to identify mispriced stocks when issuing their recommendations and price forecasts. Surveys and interviews, particularly popular methods of investigating analysts' valuation model preferences, generally find most prefer price-earnings valuation heuristics to multi-period valuation techniques. Nearly half the respondents in a 1998 U.S. survey of the Association of Investment Management and Research (AIMR) members never used present value (PV) techniques when valuing stocks in practice

(Block, 1999). However, they still considered earnings and cash flow information the most important inputs in the stock valuation process.

Moreover, in a concurrent U.K. study, analysts and fund managers also indicated their preference for simple valuation techniques (Barker, 1999). Price-earnings, dividend-yield, and price-cash flow models were all ranked more highly than discounted cash flow and dividend discount valuation models. Analysts preferred valuation heuristics because of the difficultly in reliably estimating multi-period valuation models, which can be sensitive to various underlying assumptions. Consequently, when estimating the value of a stock beyond a two-year horizon, analysts preferred using their subjective judgement. These findings confirm the results of earlier surveys and interviews, which all reveal a distinct analyst preference for price-earnings valuation techniques over discounting models (Arnold and Moizer, 1984; Moizer and Arnold, 1984; Pike *et al.*, 1993).

A popular alternative method of investigating analysts' valuation model choice is by analysing their reports. Results from U.S. content analysis studies further corroborate the interviews and surveys, and reveal analysts predominantly use price-earnings valuation heuristics over multi-period techniques (Previts *et al.*, 1994; Bradshaw, 2002; Asquith *et al.*, 2005). Moreover, while U.K. studies reveal an increasing number of analysts using discounted cash flow methods as a dominant valuation technique, price-earnings methods continued to be used as a major valuation tool (Demirakos *et al.*, 2004; Imam *et al.*, 2008). In addition to price-earnings ratios, Bradshaw (2002) observe analysts regularly use their long-term growth projections to justify issuing favourable stock recommendations and price forecasts. Moreover, by combining the price-earnings ratio, calculated using analysts' forecast earnings, with their long-term growth

projections, Bradshaw (2002) constructs a price-earnings-growth ratio (PEG) which he then compares to the analyst recommendations. He observes that, when analysts issue recommendations and price targets, the PEG ratio is positively and significantly associated with their recommendation. However, when analysts only issued a recommendation, and did not issue a price target, the PEG model failed to provide a meaningful justification for the recommendation. One possible explanation for these findings could be that analysts, issuing a stock recommendation without a price forecast, lack confidence in the inputs of, and therefore the results from, their valuation models (Bradshaw, 2002). Price targets are, after all, far less opaque than stock recommendations and provide investors with a better benchmark against which to measure analyst performance. Consequently, it is increasingly important to examine not only which valuation models are predominantly used by analysts, but also which valuation inputs are used in these models.

7.2.2 Analysts' Earnings Forecasts as Valuation Inputs

Surveys, interviews, and content analysis studies consistently show analysis prefer simple valuation heuristics over multi-period valuation models when determining whether a stock is mispriced for the purposes of issuing their stock recommendation. However, while viewed as their final output, issuing a stock recommendation is essentially the result of a process that generally includes analysts issuing forecasts for both earnings and cash flows (Schipper, 1991; Brown, 1993). To better understand this process, Schipper (1991) and Brown (1993) both call for empirical research examining the link between analysts' recommendations and their forecasts.

In response to Schipper (1991) and Brown (1993), Bradshaw (2004) provides some of the first empirical evidence that financial analysts do make use of their earnings

forecasts when issuing stock recommendations. By using a sample of U.S. firms between 1994 and 1998, and following Bradshaw (2002) to construct a PEG heuristic using analysts' earnings and growth forecasts, Bradshaw (2004) finds a significant positive relationship between his PEG heuristic and analysts stock recommendations. Moreover, analysts' long-term earnings growth forecasts are also significantly and positively associated with their stock recommendations. In contrast, however, Bradshaw (2004) observes a counterintuitive negative relationship between the price standardised residual income valuation, also calculated using analysts' earnings forecasts, and their stock recommendation. Analysts appear to issue negative/(positive) recommendations when the residual income valuation is greater/(lower) than the current share price. While analysts use their earnings forecasts in simple valuation heuristics, they do not appear to use them in more complex multi-period valuation models when issuing their recommendations. However, Bradshaw (2004) does find a significant positive relationship between one-year-ahead size-adjusted returns and the residual income valuation. These findings imply that it would be more profitable for buy-and-hold investors to use analysts' earnings forecasts in multi-period residual income models, rather than following the analysts' recommendations.

Barniv *et al.* (2009) and Barniv *et al.* (2010) both extend Bradshaw's (2004) study, and provide further evidence of a significant positive relationship between valuation heuristics based on analysts' earnings forecasts and their stock recommendations. By expanding the sample period from 1993 to 2005, Barniv *et al.* (2009) examines the impact of regulatory changes in the U.S. financial analyst industry on the process by which analysts' arrive at their stock recommendations. Prior to the introduction of

Regulation Fair Disclosure[53] (Reg FD) in 2000, they observe very similar findings to Bradshaw (2004). However, subsequent to Reg FD they find a significant decline in the negative relationship between recommendations and residual income valuations. These results suggest that the regulatory reforms in the U.S. have increased analyst discipline, and subsequently increased the quality of their recommendations. However, irrespective of the time period used, their results still reveal analysts continue to use PEG and long-term earnings growth heuristics when issuing their recommendations. Moreover, analysts' stock recommendations continue to relate negatively to future size-adjusted returns. Consequently, investors are continually better off using analysts' earnings forecasts in a multi-period residual income valuation model to identify mispriced stocks compared to relying on analysts' recommendations.

More recently, in an international study between 1993 and 2007, Barniv *et al.* (2010) investigate whether a country's level of investor participation influences analysts' use of valuation heuristics compared to multi-period valuation methods when recommending stocks. Their results from high investor participation countries, including Australia, support Bradshaw's (2004) findings. Their results from low investor participation countries, however, reveal a significantly less negative, and in one case a positive relationship, between analysts' recommendations and residual income valuations using analysts' earnings forecasts. Analysts' recommendations generally appear to be less biased in low investor participation countries than high investor participation countries. In high participation countries, analysts appear to follow the historical trend observed in U.S. studies of issuing biased optimistic stock

[53] Regulation Fair Disclosure was introduced in the U.S. by the Securities Exchange Commission (SEC) on 15 August 2000, to regulate the disclosure of non-public information to select individuals, such as analysts. Disclosures of non-public information to analysts must now to be disclosed to the public at the same time.

recommendations. Barniv *et al.* (2010) conclude that this bias is likely due to the greater numbers of smaller, less sophisticated, investors in high investor participation countries which naïvely follow analysts' recommendations.

7.2.3 Analysts' Cash Flow Forecasts as Valuation Inputs

Bradshaw (2004), Barniv *et al.* (2009), and Barniv *et al.* (2010) all demonstrate analysts use their earnings forecasts in valuation heuristics when recommending stocks, however, to date, no research has examined how analysts make use of their cash flow forecasts when recommending stocks. Schipper (1991) and Brown (1993) both assert that analyst forecasts are fundamental inputs in the process of analysts determining their recommendations. Accordingly, not only analysts' earnings forecasts, but also their cash flow forecasts should provide useful information in evaluating whether stocks are mispriced in the process of arriving at their final recommendation.

While analysts have been issuing earnings forecasts for decades, the frequency of analysts issuing cash flow forecasts, alongside their earnings forecasts, is increasing. Evidence from a recent international study by DeFond and Hung (2007) shows a rise in the numbers of analysts forecasting both cash flows and earnings from 30% in 1994 up to 58% by 2002. This growing number of analysts forecasting cash flows is partly due to increased market demand for price relevant information, especially for firms with volatile earnings, high levels of accruals and poor financial health (DeFond and Hung, 2003). Moreover, analysts who issue both earnings and cash flow forecasts have been found to issue significantly more accurate earnings forecasts (Call *et al.*, 2009), while at the same time providing an external deterrent to earnings management (Call, 2008; McInnis and Collins, 2011).

Although prior research show analysts predominantly use price-earnings valuation heuristics, content analysis studies show some analysts also use cash flow valuation heuristics or discounted cash flow techniques as part of the stock evaluation process. Asquith *et al.* (2005) finds evidence that discounted cash flow techniques were utilised in 13% of their sample, while Demirakos *et al.* (2004) observe that, for their sample, 38% of analysts use DCF techniques, with 20% using DCF as the dominant valuation method. When choosing between multi-period models, analysts appeared to prefer DCF as Demirakos *et al.* (2004) find less than 2% of the reports reveal any reference to analysts' use of residual income valuation techniques. Moreover, single period "price-cash flow" ratios were used, on several occasions, to check the dominant valuation model's results. Further, extending Demirakos *et al.* (2004), Imam *et al.* (2008) observed 62% of the 98 U.K. analyst reports referred to cash flow based models as the dominant valuation technique when recommending stocks.

Evidence that analysts find cash flow information useful to identify mispriced securities comes as no surprise given the asserted benefits provided by a Statement of Cash Flows as documented by the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB). For example, IAS 7 states that:

> *"Cash flow information is useful in assessing the ability of the entity to generate cash and cash equivalents and enables users to develop models to assess and compare the present value of the future cash flows of different entities."*
>
> *(IASB, 2010, paragraph 4)*

Discounted projections of future cash flows should provide, therefore, a reasonable benchmark against which to compare the current market price, and so identify whether or not the stock is mispriced. Further, confirming the usefulness of cash flow information to identify mispriced stocks, Sloan (1996) observes how portfolios of firms with high levels of reported cash flows earned positive abnormal annual stock returns compared to portfolios with high levels of accruals. Whilst Sloan (1996) highlights possible shortcomings to developing a trading strategy of taking a long/short position for stocks with high/low levels of cash flows relative to accruals, cash flow information is still clearly useful in the process of identifying mispriced securities.

Prior empirical research has demonstrated that analysts do make use of their earnings forecasts by using heuristic valuations, such as the PEG model, to identify mispriced stocks (Bradshaw, 2004; Barniv *et al.*, 2009, 2010). However, no empirical research has considered whether analysts also use their cash flow forecasts in heuristic valuations to identify mispriced securities in the process of determining their final recommendation. Cash flow information has been shown to be useful in identifying mispriced stocks (Sloan, 1996), and growing numbers of analysts have been issuing cash flow forecasts alongside their earnings forecasts (DeFond and Hung, 2007). Accordingly, if analysts use valuation heuristics based on their cash flow forecasts to identify mispriced stocks, then there should be a positive relationship between these heuristics and their stock recommendations. Hence, the first hypothesis to be presented is:

H1a: Analysts issue more/less favourable recommendations for high/low heuristic valuations based on analysts' forecast cash flows or earnings

7.2.3.1 Usefulness of Direct Cash Flow Information

Financial analysts were strongly in favour of the recent joint proposal from The International Accounting Standards Board (IASB) and Financial Accounting Standards Board (FASB) to mandate direct cash flow statements.[54] Analyst support for the proposal was based largely on their commonly held opinion that direct cash flow statements provide better information for forecasting future cash flows and measuring earnings quality than indirect cash flow statements.[55] Their viewpoint is strongly backed by a number of empirical studies which show that direct cash flow statements provide incremental information when forecasting future cash flows (e.g., Krishnan and Largay III, 2000; Orpurt and Zang, 2009; Arthur *et al.*, 2010; Farshadfar and Monem, 2012, 2013).

Given analysts strong support of the current proposal to mandate the use of direct cash flow statements, Hales and Orpurt (2012) questioned whether, when available, analysts would actually make use of information from direct cash flow statements when forecasting cash flows, or issuing stock recommendations. If analysts use valuation heuristics based on direct cash flow information to identify mispriced stocks, then there should be a positive relationship between these heuristics and their stock recommendations. Accordingly, H1b is:

H1b: Analysts issue more/less favourable recommendations for high/low heuristic valuations based on historical core direct cash flows

[54] See the FASB Proposed Accounting Standards Update published in July 2010 (paragraph 177).
[55] See the CFA Institute Member Poll: Cash Flow Survey published in 2009.

7.2.3.2 Multi-period Valuation Models

Interviews and surveys (Barker, 1999; Block, 1999), and content analysis studies (Previts *et al.*, 1994; Bradshaw, 2002; Demirakos *et al.*, 2004; Asquith *et al.*, 2005) show analysts predominantly use valuation heuristics over multi-period valuation models. Moreover, recent empirical studies consistently find either no relationship, or a significantly negative relationship between residual income valuations based on analysts forecast earnings and their stock recommendations (Bradshaw, 2004; Barniv *et al.*, 2009, 2010). Analysts appear to disregard the results of residual income valuation models based on their forecast earnings when issuing their stock recommendations, relying instead on earnings based valuation heuristics. Research has yet to establish, however, whether this trend persists if analysts' cash flow forecasts are used to calculate a discounted cash flow valuation against which to benchmark the current stock price. If analysts predominantly rely on the results of valuation heuristics, and disregard the use of discounted cash flow models, then there should be no meaningful relationship between analysts' recommendations and DCF valuations based on their forecast cash flows. Therefore, the second hypothesis is:

H2: When issuing their stock recommendations, analysts disregard the results of discounted cash flow or residual income valuation models using their cash flow or earnings forecasts

7.2.4 Analysis of Future Excess Returns and Valuation models

While analysts are shown to use their earnings forecasts in heuristic models when issuing their stock recommendations, prior studies show buy-and-hold investors are unlikely to earn excess annual returns by following these recommendations (Bradshaw, 2004; Barniv *et al.*, 2009, 2010). In fact, in contrast to analysts' choice of valuation

model, buy-and-hold investors are consistently shown to earn future excess returns when using multi-period residual income valuation models based on analysts' earnings forecasts. To date, however, no studies have shown whether this trend persists if analysts' cash flow forecasts are used to calculate a discounted cash flow valuation. Buy-and-hold investors should also earn future excess returns when using multi-period discount cash flow valuation models based on analysts' cash flow forecasts. This issue is investigated by the final hypothesis:

H3: Buy-and-hold investors earn positive future excess annual returns by using analysts' earnings and cash flow forecasts in discounted valuation models, but negative returns by following analysts' recommendations or heuristic valuations

7.3 Research Design

7.3.1 Using Analysts' Earnings and Long Term Growth Forecasts

7.3.1.1 Residual Income Valuation with Fade-Rate Assumption (VRi1)

Following Bradshaw (2004), Barniv *et al.* (2009) and Barniv *et al.*(2010) a residual income valuation model is used which calculates intrinsic value as the sum of the discounted present value of expected residual income over the next five years, a terminal value at the end of five years, and the current book value:

$$VRi1_t = BVPS_t + \sum_{k=1}^{5} \frac{E_t[Ri_{t+k}]}{(1+r)^k} + \frac{E_t[TV_{t+5}]}{(1+r)^5} \quad (7.1a)$$

Where $VRi1_t$ is the discounted residual income valuation in year *t,* calculated by assuming a terminal value with a fade rate of ten years*;* $BVPS_t$ is the book value per share in year *t*; $E_t[.]$ is expectations conditioned on information available at year *t,* and

r is the equity cost of capital used as the discount rate.[56] Ri_{t+k} is the residual income per share, calculated using the equation $Ri_{t+k} = EPS_{t+k} - r*(BVPS_{t+k-1})$, where EPS_{t+k} is analysts forecast earnings per share for year *t+k* and $BVPS_{t+k-1}$ is the book value per share for year *t+k-1*. For estimates of *BVPS* beyond year t, Barniv *et al.* (2010) is followed by calculating $BVPS_{t+k} = BVPS_{t+k-1} + EPS_{t+k} - DIV_{t+k}$, where DIV_{t+k} is ordinary dividends, assuming a constant payout ratio from year t. TV_{t+5} is the discounted terminal value of forecast abnormal earnings, five years after the stock recommendation date, following Barniv *et al.* (2010), by assuming forecast abnormal earnings revert to zero after ten years, i.e. fifteen years after the stock recommendation date. Table 7-1 helps to illustrate the timeline for estimating Equation (7.1a).

Table 7-1 Timeline for estimating Equation (7.1a)

t_0	t_0	$t_1 \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots t_5$	$t_6 \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots t_{15}$
$VRi1_t =$	$BVPS_t$	$+\sum_{k=1}^{5} \frac{E_t[Ri_{t+k}]}{(1+r)^k}$	$+\frac{E_t[TV_{t+5}]}{(1+r)^5}$

The table illustrates the timeline when estimating Equation (7.1a)

$VRi1_t$ is then scaled by the share price at the recommendation date to provide a variable with a distribution that can be compared with the distribution of the analysts' consensus stock recommendation:

$$VRi1P_t = \frac{VRi1_t}{P_t} \tag{7.1b}$$

[56] The cost of equity capital is calculated using the principles of the capital asset pricing model $r_{it} = r_{riskfree} + \beta_{it}\left(r_{market} - r_{riskfree}\right)$. Where $r_{riskfree}$ is the annual yield on 10 year Australian government treasury bonds; r_{market} is the historical weekly rolling average of the annual return for the ASX300 index calculated over the prior 156 weeks; β is calculated using a 156 week rolling window by dividing the covariance between the annual returns for the ASX300 index and annual returns of the firms share price, by the variance of the ASX300 index over the same period.

Where $VRi1P_t$ is the price standardised residual income valuation assuming a fade rate of ten years, $VRi1_t$ is the residual income valuation as calculated using Equation (7.1a) and P_t is the share price at the recommendation date.

7.3.1.2 Residual Income Valuation with Perpetuity Assumption (VRi2)

Next, following Bradshaw (2004), Barniv *et al.* (2009) and Barniv *et al.*(2010), the discounted residual income valuation is calculated, after assuming that, rather than reverting to zero after ten years as assumed in Equation (7.1a), forecast abnormal earnings five years after the stock recommendation date will continue in perpetuity:

$$VRi2_t = BVPS_t + \sum_{k=1}^{5} \frac{E_t[Ri_{t+k}]}{(1+r)^k} + \frac{E_t[Ri_{t+5}]}{r(1+r)^5} \quad (7.2a)$$

Where $VRi2_t$ is the discounted residual income valuation in year t calculated by assuming a terminal value where forecast abnormal earnings five years after the stock recommendation date continue in perpetuity. As in Equation (7.1b), Equation (7.2a) is also standardised by the share price at the recommendation date:

$$VRi2P_t = \frac{VRi2_t}{P_t} \quad (7.2b)$$

Where $VRi2P_t$ is the price standardised residual income valuation assuming a terminal value where forecast abnormal earnings five years after the stock recommendation date continue in perpetuity, $VRi2_t$ is the residual income valuation as calculated using Equation (7.2a), and P_t is the share price at the recommendation date.

7.3.1.3 Price-Earnings-Growth-Heuristic (VPeg)

Prior studies have found significantly positive correlations between analysts' consensus stock recommendations and the price-earnings-growth (PEG) ratio calculated when using analysts forecast earnings and projections of long term earnings growth (Bradshaw, 2004; Barniv *et al.*, 2009, 2010). Therefore, following Bradshaw (2004), the PEG ratio is computed as follows:

$$VPeg_t = \frac{E_t[Eps_{t+2}] * LTG * 100}{P_t} \tag{7.3}$$

Where $Vpeg_t$ is the heuristic PEG valuation at the stock recommendation date, Eps_{t+2} is the two year ahead analyst earnings forecast, LTG is analysts' long-term earnings growth forecast, and P_t is the share price at the recommendation date.

7.3.1.4 Price-Earnings Ratios (PE)

Earlier studies also find widespread use of price-earnings metrics by analysts when establishing their stock recommendations (Barker, 1999; Bradshaw, 2002; Demirakos *et al.*, 2004). Therefore, in order to explore the usefulness of price-earnings heuristic valuations, three derivations of the price-earnings heuristic are defined as follows:

$$PEhis_t = \frac{P_t}{Eps_T} \tag{7.4a}$$

Where $PEhis_t$ is the historical price-earnings ratio, calculated by dividing the share price at the recommendation date (P_t) by the historical annual earnings per share reported at the last fiscal year-end (Eps_T). However, in order to examine how analysts use their one-year earnings forecasts when establishing their stock recommendations, Equation (7.4b) is derived as follows:

$$PE1yr_t = \frac{P_t}{E_t[Eps_{t+1}]} \quad (7.4b)$$

Where $PE1yr_t$ is the one year forward looking price-earnings ratio, calculated by dividing the share price at the recommendation date (P_t) by the analysts' one-year forward looking forecast of earnings per share, also issued on the recommendation date. Equation (7.4c) extends Equation (7.4b) by employing the use of analysts' two-year earnings forecasts:

$$PE2yr_t = \frac{P_t}{E_t[Eps_{t+2}]} \quad (7.4c)$$

Where $PE2yr_t$ is the two year forward looking price-earnings ratio calculated by dividing the share price at the recommendation date (P_t) by the analysts' two-year forward looking forecast of earnings per share, also issued on the recommendation date.

7.3.1.5 Long Term Growth Heuristic (LTG)

Finally, given the significant use of analysts long-term earnings growth forecasts when setting stock recommendations (Bradshaw, 2004; Barniv *et al.*, 2009, 2010), analysts long-term earnings growth forecasts (LTG) is included as the final earnings heuristic metric.

7.3.2 Using Analysts' Cash Flow Forecasts and Direct Cash Flow Information

7.3.2.1 Discounted Cash Flow with Fade-Rate Assumption (Vdcf1)

Results from Demirakos *et al.* (2004) content analysis study reveal a significant number of U.K. analysts prefer to use the discount cash flow model as their dominant valuation model, while using the single period "price-cash flow" ratio as a sensitivity check for

the results of their dominant model. By following a similar approach used in the construction of the residual income valuation models in Equations (7.1) and (7.2), the usefulness of analysts' cash flow forecasts can also be examined when incorporated into two distinct discounted cash flow valuation models as follows:

$$Vdcf1_t = \sum_{k=1}^{5} \frac{E_t[Cps_{t+k}]}{(1+r)^k} + \frac{E_t[CTV_{t+5}]}{(1+r)^5} \quad (7.5a)$$

Where $Vdcf1_t$ is the discounted cash flow valuation in year *t*, calculated by assuming a terminal value with a fade rate of ten years; $E_t[.]$ is expectations conditioned on information available at year *t*, and *r* is the equity cost of capital used as the discount rate. Cps_{t+k} is analysts forecast of cash flow per share for year $t+k$.[57] CTV_{t+5} is the discounted terminal value of forecast cash flows, five years after the stock recommendation date, by assuming analysts five year forecast cash flows revert to zero after ten years, i.e. fifteen years after the stock recommendation date. Table 7-2 helps to illustrate the timeline for estimating Equation (7.5a).

Table 7-2 Timeline for estimating Equation (7.5a)

t_0	$t_1 \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots t_5$	$t_6 \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots t_{15}$
$Vdcf1_t =$	$\sum_{k=1}^{5} \frac{E_t[Cps_{t+k}]}{(1+r)^k}$	$+\frac{E_t[CTV_{t+5}]}{(1+r)^5}$

The table illustrates the timeline when estimating Equation (7.5a)

$Vdcf1_t$ is then scaled by the share price at the recommendation date to provide a variable with a distribution that can be compared with the distribution of the analysts' consensus stock recommendation:

[57] All references to forecasts of cash flow per share used in this chapter refer to the Thomson Reuters Institutional Brokers' Estimate System (I/B/E/S) analysts' forecasts of operating cash flow per share.

$$Vdcf1P_t = \frac{Vdcf1_t}{P_t} \tag{7.5b}$$

Where $Vdcf1P_t$ is the price standardised discounted cash flow valuation assuming a fade rate of ten years, $Vdcf1_t$ is the discounted cash flow valuation as calculated using Equation (7.5a) and P_t is the share price at the recommendation date.

7.3.2.2 Discounted Cash Flow with Perpetuity Assumption (Vdcf2)

Following the approach used for the discounted residual income model in Equation (7.2a), the discounted cash flow valuation is calculated, after assuming forecast cash flows, five years after the stock recommendation date, will continue in perpetuity:

$$Vdcf2_t = \sum_{k=1}^{5} \frac{E_t[Cps_{t+k}]}{(1+r)^k} + \frac{E_t[Cps_{t+5}]}{r(1+r)^5} \tag{7.6a}$$

Where $Vdcf2_t$ is the discounted cash flow valuation in year *t* calculated by assuming a terminal value where forecast cash flows five years after the stock recommendation date continue in perpetuity. As in Equation (7.5b), Equation (7.6a) is also standardised by the share price at the recommendation date:

$$Vdcf2P_t = \frac{Vdcf2_t}{P_t} \tag{7.6b}$$

Where $Vdcf2P_t$ is the price standardised discount cash flow valuation assuming a terminal value where forecast cash flows five years after the stock recommendation date continue in perpetuity, $Vdcf2_t$ is the discount cash flow valuation as calculated using Equation (7.6a), and P_t is the share price at the recommendation date.

7.3.2.3 Price-Cash-Flow-Growth Heuristic (VPcshg)

Barniv *et al.* (2009), Barniv *et al.* (2010), and Bradshaw (2004) clearly demonstrate the strong correlation between both the PEG ratio and LTG forecasts and analysts stock recommendations. It follows, therefore, that by constructing a "price-cash-flow-growth" metric, the use of analysts' cash flow forecasts in valuation heuristics to establish their stock recommendations can be examined:

$$VPcshg_t = \frac{E_t[Cps_{t+2}] * LTG * 100}{P_t} \tag{7.7}$$

Where $VPcshg_t$ is the heuristic price-cash-flow-growth valuation at the stock recommendation date, Cps_{t+2} is the two year ahead analyst cash flow forecast, LTG is analysts' long-term earnings growth forecast, and P_t is the share price at the recommendation date.

7.3.2.4 Price-Cash-Flow Ratios (Pcf)

Analysts have also been shown to make use of single period price-cash-flow (PCF) ratios as a sensitivity check for the results of their dominant valuation model (Demirakos *et al.*, 2004). Accordingly, three distinct heuristic measures of the PCF are constructed, considering both historical and forward-looking projections of operating cash flows:

$$Pcfhis_t = \frac{P_t}{Cps_T} \tag{7.8a}$$

Where $Pcfhis_t$ is the historical price-cash-flow heuristic at the stock recommendation date, calculated by dividing the share price at the recommendation date (P_t) by the historical annual operating cash flow per share reported at the last fiscal year-end

(Cps_T). Equation (7.8b) is then derived to examine how analysts use their one-year cash flow forecasts when establishing their stock recommendations:

$$Pcf1yr_t = \frac{P_t}{E_t[Cps_{t+1}]} \tag{7.8b}$$

Where $Pcf1yr_t$ is the one year forward looking price-cash-flow ratio, calculated by dividing the share price at the recommendation date (P_t) by the analysts' one-year forward looking forecast of cash flow per share, also issued on the recommendation date. Finally, Equation (7.8c) extends Equation (7.8b) by employing the use of analysts' two-year cash flow forecasts:

$$Pcf2yr_t = \frac{P_t}{E_t[Cps_{t+2}]} \tag{7.8c}$$

Where $Pcf2yr_t$ is the two year forward looking price-cash-flow ratio calculated by dividing the share price at the recommendation date (P_t) by the analysts' two-year forward looking forecast of cash flow per share, also issued on the recommendation date.

7.3.2.5 Direct Cash Flow ratio (PDcf)

Cash receipts from customers and payments to suppliers and employees are considered by analysts to be the most useful information from a direct cash flow statement when forecasting future cash flows (CFA Institute, 2009). Accordingly, a heuristic measure is developed to capture whether analyst's use information from direct cash flow statements when setting their stock recommendations. This measure is derived by manipulating the historical price-cash-flow ratio, replacing the denominator with the net

of the cash receipts from customers per share and payments to suppliers and employees per share:

$$PDcf_t = \frac{P_t}{(Core\_OCFps_T)} \tag{7.9}$$

Where $PDcf_t$ is the ratio of the share price at the stock recommendation date (P_t), divided by core direct cash flows per share $Core\_OCFps_T$ as reported at the last financial year-end. $Core\_OCFps_T$ is calculated as the net of cash receipts from customers and payments to suppliers and employees, standardised by the number of shares in issue at the last financial year-end.

7.4 Data, Sample and Descriptive Statistics

Using DataStream, 652 firms are initially selected representing companies listed on the Australian Stock Exchange (ASX) 300 index between the years 2000-2010.[58] Monthly analysts' stock recommendations and forecasts are then obtained from Thomson Reuters Institutional Brokers' Estimate System (I/B/E/S) for the entire sample period. Financial data was obtained from the Aspect Huntley database, which provides a detailed breakdown of direct operating cash flows that are otherwise unavailable elsewhere.

Financial and utilities firms, firms with a primary listing other than the ASX, and firms missing key financial information are then removed from the initial sample.[59] A further 68 firms are removed which have either no analysts' recommendations or no

[58] Australia is historically one of a few countries to mandate the use of direct cash flow statements. Therefore, Australian firms are specifically chosen to examine whether analysts use direct cash flow information when issuing their stock recommendations.

[59] Financial and utility firms are removed because of their different reporting requirements and foreign domiciled firms are excluded, as they do not follow Australian GAAP.

new analyst recommendations issued on I/B/E/S throughout the entire sample period. Next, 39 firms are removed with a following of consistently less than three analysts during the sample period, and 151 firms are removed which are missing the necessary data requirements for calculating the valuation metrics using Equations (7.1) to (7.9).

Of the 151 firms excluded, 45 firms were missing long-term growth, earnings, or cash flow forecasts, three firms consistently received negative growth forecasts, and two firms' market values were consistently less than $10 million. A further seven firms were excluded when trimming the key variables to remove extreme observations in the upper and lower 1% of the sample population, and 94 firms were excluded for missing the data required to calculate the valuation metrics.[60] Finally, in addition to the 151 firms already excluded, 47 firms are removed which have less than five changes in analyst recommendations during the entire sample period. The final sample of 179 firms and 4,961 firm month observations, over the period January 2000 to December 2010, is shown in Table 7-3, Panel A, and includes only those observations where one or more analysts have revised their recommendation.[61]

Table 7-3, Panel B, presents the distribution of the sample, across the sample period of eleven years from 2000-2010, by industry classification and firm-year. It shows that more than 80% of the sample, based on firm numbers or firm month observations, is represented by firms from Consumer goods and services, Industrials, and Extractive

[60] These sample selection criteria ensure that the numbers of observations are identical for all models.
[61] I/B/E/S continues to show the analysts past recommendation for each successive month until the recommendation is revised. Therefore, to avoid including stale recommendations, firm month observations are only included when there has been a revision in the recommendation by one or more analysts. However, the results remain unchanged when relaxing these requirements and including observations with no changes in analysts' recommendations or observations with a following of less than three analysts.

industries.[62] Consumer goods and services represent the largest proportion of the sample population with 2,030 firm month observations. By requiring cost of capital to be positive, following Hail and Leuz (2003), a drop in the number of observations meeting the necessary data requirements is further observed during the years 2003, 2009 and 2010 respectively.

Distribution of the sample by the number of recommendations issued at the end of each of the twelve successive months subsequent to the preceding financial year-end is shown in Table 7-3, Panel C, with a range from 343 to 465 observations. The highest numbers of analyst stock recommendations are issued three to four, and eight to nine months after the financial year-end. This is likely due to the ASX requirements for companies to publish annual reports within four months, and half-yearly reports within two months of the reporting date.

[62] Prior Australian studies either specifically include or exclude extractive firms from their samples (e.g., Clinch *et al.*, 2002; Arthur *et al.*, 2010). For the purposes of this study, extractive firms are specifically included. Untabulated findings found that excluding these firms did not significantly change the results. Accordingly, the results presented and discussed in this chapter are based on the sample including extractive firms.

Table 7-3 Sample selection and distribution

Panel A: Sampling process

	Total Firms
Initial sample of firms identified on the ASX300 index for fiscal years from 2000 to 2010	652
Less: Foreign with a primary listing other than the ASX	(17)
Less: Financial firms	(137)
Less: Utility firms	(14)
Less: Firms with no analysts stock recommendations issued during the sample period	(38)
Less: Firms with no change in analyst consensus recommendation during the sample period	(30)
Less: Firms with consistently less than three analysts issuing recommendations during the sample period	(39)
Less: Firms with missing data requirements for all valuation models	(151)
Less: Firms with less than five observations during the sample period	(47)
Final sample	179

Panel B: Sample distribution of consensus stock recommendations by industry sector and fiscal year

Industry	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Obs	Firms
Basic materials	17	16	16	5	11	32	36	37	31	0	0	201	5
Consumer goods & services	223	208	228	119	132	251	242	269	298	44	16	2,030	67
Extractive firms	82	65	68	10	13	73	97	104	101	7	0	620	32
Healthcare	23	42	56	13	20	51	59	62	65	20	9	420	11
Industrials	136	134	122	39	48	171	199	261	230	18	3	1,361	48
Technology	8	14	13	2	14	39	49	79	57	3	0	278	15
Telecommunications	0	9	10	1	4	4	4	9	9	1	0	51	1
Total	489	488	513	189	242	621	686	821	791	93	28	4,961	179

Table 7-3 (continued)

Panel C: Sample distribution of consensus stock recommendations by industry sector and the number of months recommendations were issued after the last financial year-end

Industry	0	1	2	3	4	5	6	7	8	9	10	11	Obs
Basic materials	17	18	14	21	14	19	13	16	18	19	18	14	201
Consumer goods & services	159	163	150	196	174	174	175	135	207	183	154	160	2,030
Extractive firms	50	53	58	51	45	57	49	43	55	50	53	56	620
Healthcare	34	35	28	34	39	36	35	22	33	48	36	40	420
Industrials	103	103	107	134	114	141	109	98	117	127	96	112	1,361
Technology	18	24	20	24	21	26	26	25	19	28	22	25	278
Telecommunications	3	5	4	5	5	3	4	4	5	3	6	4	51
Total	384	401	381	465	412	456	411	343	454	458	385	411	4,961

Panel D: Sample distribution of stock recommendations by recommendation level and year

Year	Strong buy	Buy	Hold	Underperform	Sell	Total
2000	1,566	1,099	2,161	139	259	5,224
2001	1,630	1,072	2,582	104	283	5,671
2002	1,511	1,252	2,452	153	204	5,572
2003	262	375	1,014	104	67	1,822
2004	313	420	1,158	106	116	2,113
2005	878	1,239	2,663	342	281	5,403
2006	1,214	1,181	3,188	438	236	6,257
2007	1,399	1,739	3,715	533	298	7,684
2008	1,667	2,028	3,512	537	230	7,974
2009	216	278	522	66	32	1,114
2010	47	78	174	37	8	344
Total	10,703	10,761	23,141	2,559	2,014	49,178
Percentage	21.8%	21.9%	47.1%	5.2%	4.1%	100.0%

Table 7-3, Panel D, presents the sample distribution by the level of the stock recommendation and year in which the recommendation was issued. In total, there are 49,178 individual stock recommendations issued over the sample period, which provides an average of more than nine analyst recommendations per firm month observation. In line with Wahlen and Wieland (2011), who analyse U.S. stock recommendations between 1994 and 2005, only a small percentage (9.3%) of the stock recommendations issued are categorized as either "underperform" or "sell". However, unlike Wahlen and Wieland (2011) who observe 73% of recommendations to be either "strong buy" or "buy", a lower amount, 43% of recommendations, are classified as either "strong buy" or "buy" in Table 7-3, Panel D. "Hold" is by far the single largest classification of stock recommendations, comprising just over 47% of the sample population.

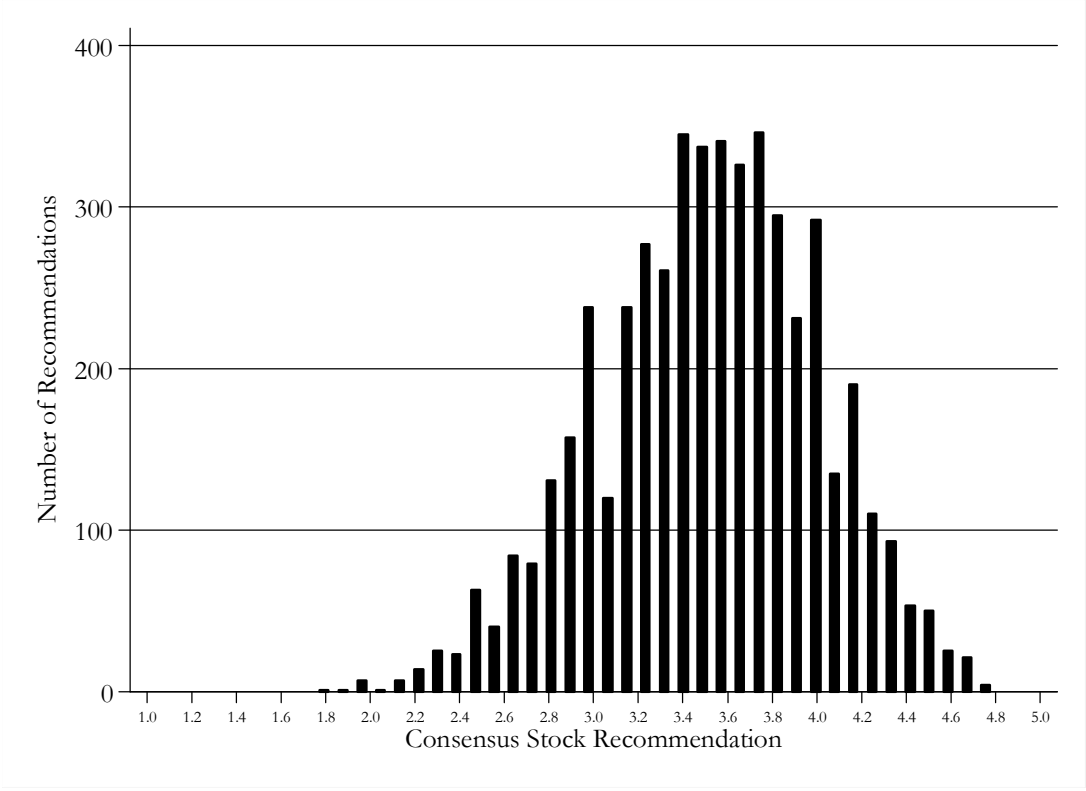
Figure 7-1 and 7-2, respectively, illustrates the frequency distribution of the average consensus analyst stock recommendations (REC), and the change in REC between January 2000 and December 2010, where 1 = Sell, 2 = Underperform, 3 = Hold, 4 = Buy, and 5 = Strong buy. Figure 7-1 shows a normally distributed sample around a median recommendation of 3.5, only marginally lower than the median of 3.87 documented by Bradshaw (2004) for his sample of consensus stock recommendations in the U.S. Moreover, Figure 7-2 illustrates that the change in average analyst consensus recommendations is also normally distributed, with a fairly equal number of positive and negative revisions.

Consistent with prior studies, Figure 7-1 shows that there are very few "sell" or "underperform" recommendations, with analysts tending to be more inclined to issue either "hold", "buy", or "strong-buy" opinions. Figure 7-2 further illustrates that

average consensus recommendations are rarely revised up or down by more than one level, indicating that analysts are unlikely to all revise their recommendations in a consistent manner.

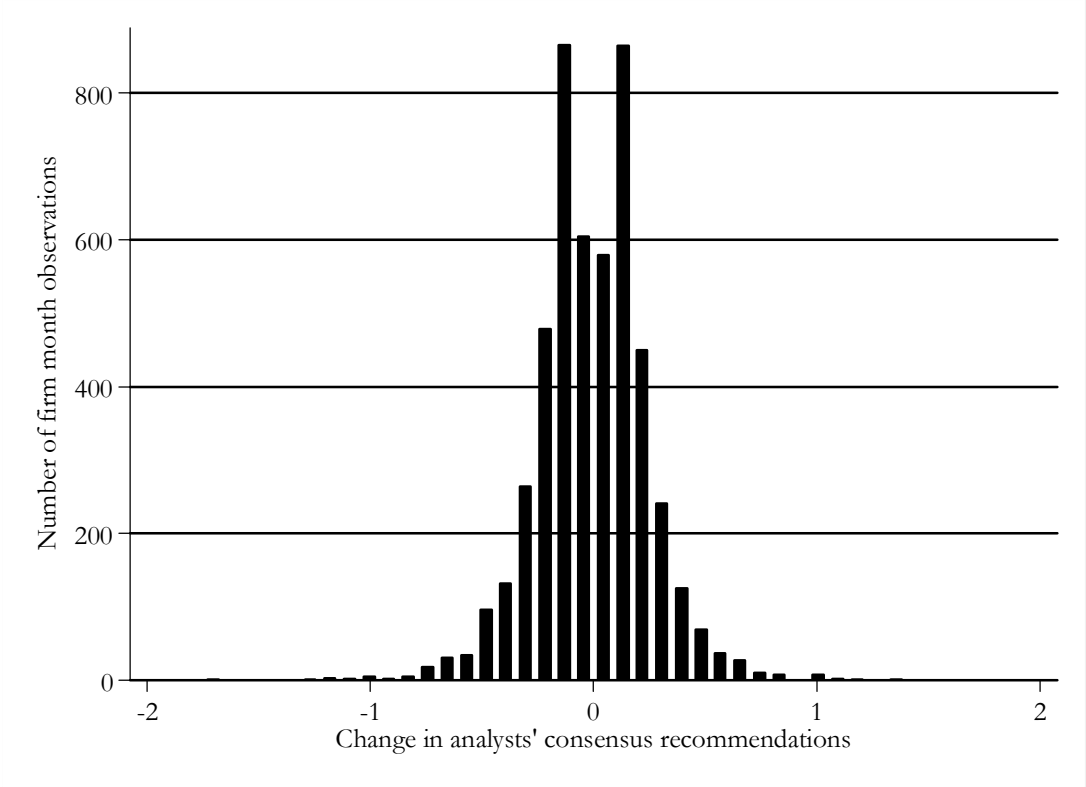
As graphically illustrated by Figure 7-1, Table 7-4, reporting descriptive statistics of the key variables used in the regression analysis, shows analysts' consensus stock recommendations (REC) are normally distributed with mean and median value of 3.52 and 3.54 respectively. Moreover, the number of individual stock recommendations (Num) per firm month is normally distributed with mean and median values of 9.91 and 10 respectively.

Figure 7-1 Distribution of analysts' consensus stock recommendations



The figure represents the distribution of 4,961 consensus stock recommendations issued by analysts for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010, where 1 = Sell, 2 = Underperform, 3 = Hold, 4 = Buy, and 5 = Strong buy.

Figure 7-2 Distribution of the change in analysts' consensus stock recommendations



The figure represents the distribution of the change in analysts' consensus stock recommendations for 4,961 firm month observations from 179 Australian companies listed on the ASX300 index between January 2000 and December 2010

Table 7-4 Pooled descriptive statistics

Variable	Mean	SD	Min	Med	Max
REC	3.52	0.49	1.75	3.54	4.80
Num	9.91	3.28	3.00	10.00	20.00
RECSD	0.89	0.27	0.00	0.89	2.12
VRi1P	0.69	0.38	0.02	0.62	3.85
VRi2P	0.98	0.76	0.00	0.76	4.66
VPeg	0.78	0.54	0.05	0.65	4.95
Vdcf1P	0.84	0.45	0.08	0.75	3.35
Vdcf2P	1.70	1.16	0.09	1.41	5.00
VPcshg	1.15	0.80	0.07	0.94	4.99
PEhst	20.16	13.71	-129.76	17.83	131.53
PE1yr	20.03	15.65	-51.47	16.80	200.00
PE2yr	16.66	10.66	1.69	14.75	121.46
Pcfhst	14.66	16.05	-132.33	12.59	183.55
Pcf1yr	13.46	9.67	1.57	11.45	100.67
Pcf2yr	11.55	7.60	1.31	10.11	82.15
PDcf	10.09	15.45	-201.94	8.48	158.38
LTG	11.41	7.88	1.12	9.77	81.55
MCAP	4,160	10,200	30	1,320	118,000
BM	0.49	0.33	0.05	0.42	2.47
DPayAvg	0.64	0.29	0.00	0.64	1.59
R	0.10	0.06	0.01	0.09	0.38

This table summarises the main sample statistics of key variables for the 4,961 consensus stock recommendations issued by analysts for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010.

Table 7-4 (continued)

Variable definitions:

REC	=	Mean analyst consensus stock recommendation, where 1 = Strong sell, 2 = Sell, 3 = Hold, 4 = Buy, and 5 = Strong buy
Num	=	Number of analysts issuing stock recommendations
RECSD	=	Standard deviation between analysts individual stock recommendations
VRi1P	=	Price standardised at the recommendation date of the residual income valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast residual income will fade to zero over a period of ten years
VRi2P	=	Price standardised at the recommendation date of the residual income valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast residual income will continue in perpetuity
VPeg	=	Price standardised at the recommendation date of the earnings growth valuation, calculated as analysts forecast of two year ahead earnings per share times LTG (x 100)
Vdcf1P	=	Price standardised at the recommendation date of the discounted cash flow valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast cash flows will fade to zero over a period of ten years
Vdcf2P	=	Price standardised at the recommendation date of the discounted cash flow valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast cash flow will continue in perpetuity
VPcshg	=	Price standardised at the recommendation date of the cash flow growth valuation, calculated as analysts two year ahead forecast of cash flow per share times LTG (x 100)
PEhst	=	Price earnings historical ratio calculated as the share price at the recommendation date divided by prior fiscal year's earnings before extraordinary items per share
PE1yr	=	Price earnings one year forward ratio calculated as the share price at the recommendation date divided by analysts one year ahead forecast of earnings per share
PE2yr	=	Price earnings two year forward ratio calculated as the share price at the recommendation date divided by analysts two year ahead forecast of earnings per share
Pcfhst	=	Price cash flow historical ratio calculated as the share price at the recommendation date divided by prior fiscal years operating cash flow per share
Pcf1yr	=	Price cash flow one year forward ratio calculated as the share price at the recommendation date divided by analysts one year ahead forecast of cash flow per share
Pcf2yr	=	Price cash flow two year forward ratio calculated as the share price at the recommendation date divided by analysts two year ahead forecast of cash flow per share
PDcf	=	Direct method cash flow coverage ratio calculated by dividing the share price at the recommendation date by the prior fiscal years net value per share of the cash receipts from customers and cash payments to suppliers and employees
LTG	=	Analysts median consensus forecast of long term earnings growth
MCAP	=	Market value in $ millions at the end of the prior fiscal year
BM	=	Book to market ratio calculated at the end of the prior fiscal year by dividing the net book value by MCAP
DPayAvg	=	Three year historical average dividend payout ratio calculated by dividing ordinary dividends for common shareholders by income after taxation but before extraordinary items
R	=	Cost of capital calculated as follows: $R_{it} = r_{riskfree} + \beta_{it}\left(r_{market} - r_{riskfree}\right)$ Where $r_{riskfree}$ is the annual yield on 10 year Australian government treasury bonds; r_{market} is the historical weekly rolling average annual return for the ASX300 index calculated over the prior 156 weeks; β is calculated using a 156 week rolling window by dividing the covariance between the annual returns for the ASX300 index and annual returns of the firms share price, by the variance of the ASX300 index over the same period.

The minimum number of analysts issuing a stock recommendation for a given firm month is three analysts, due to the sample restriction limiting observations to include only those firm months with a minimum of three analysts[63]. *Num* further shows there are no more than 20 analysts issuing stock recommendations for any given firm month. The low average and median standard deviation between analysts' individual stock recommendations (*RECSD*) of 0.89 implies a high level of consensus between analyst recommendations.

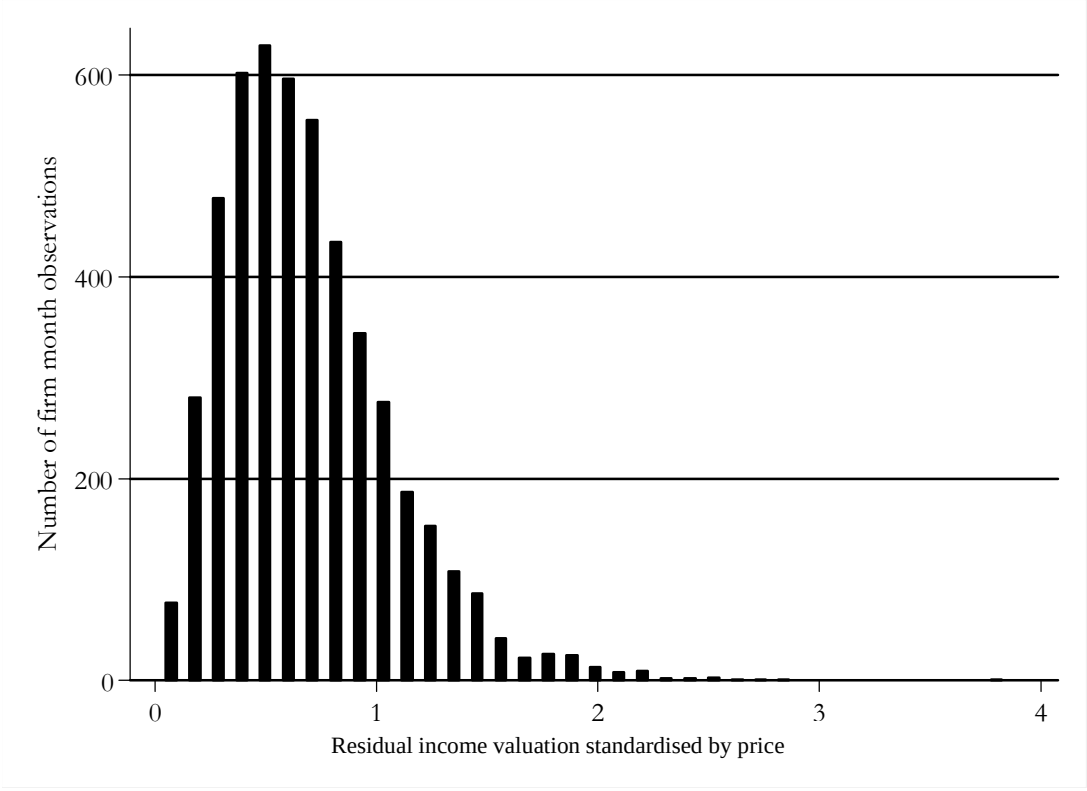
For all the price standardised valuation metrics, a value of "1" would imply that the current share price is equal to the estimated valuation measure and would therefore expect a "hold" recommendation. Likewise, if the valuation metric were below/above 1, a "sell"/"buy" recommendation would be expected. The price standardised residual income models (*VRi1P)* and (*VRi2P)* have mean values of 0.69 and 0.98 respectively, compared with those reported by Barniv *et al.* (2010) of 0.69 and 0.82 for their sample of high investor participation countries from 1993-2007.[64] Respective mean values of the discounted cash flow models *Vdcf1P* and *Vdcf2P* of 0.84 and 1.70, and the price-cash-flow growth model (*VPcshg)* of 1.15, are all larger than the price standardised earnings metrics. Figure 7-3 to Figure 7-6 graphically displays the distribution of *VRi1P, VRi2P, Vdcf1P,* and *Vdcf2P* respectively, and illustrates the difference between using a terminal valuation in Figure 7-4 and Figure 7-6, and a fade rate assumption in Figure 7-3 and Figure 7-5. They also illustrate that the discounted cash flow valuation methods

[63] While all the models are estimated using observations with three or more analysts issuing stock recommendations, the results are materially consistent when relaxing this requirement and including all observations with less than three analysts issuing stock recommendations.

[64] Following Bradshaw (2004), observations with values below 0 or above 5 are excluded for the residual income valuation metrics (*VRi1P)* and *(VRi2P),* and price-earnings-growth valuation metric (*VPeg*). Moreover, observations with values below 0 or above 5 are also excluded for the discounted cash flow valuation metrics (*Vdcf1P*) and (*Vdcf2P*), and the price-cash-flow-growth valuation metric (*VPcshg*).

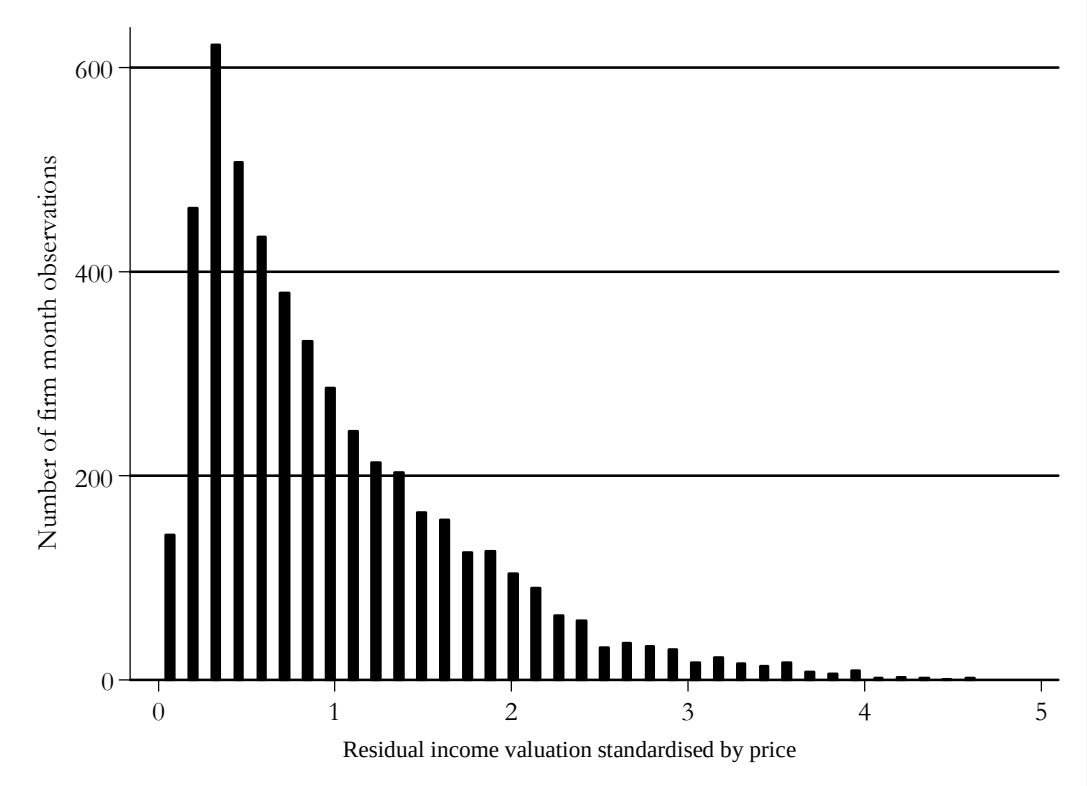
yield higher valuations relative to current price, compared to the two residual income methods, as evidenced by the higher number of firm month observations in the right tails of the distribution. The mean value for the price-earnings-growth valuation metric (*VPeg)* is 0.78, compared to 0.91 reported by Barniv *et al.* (2010). Since the average *REC* of 3.52 is between the levels of hold and buy, and the mean values for the three price standardised earnings valuation metrics are below 1, it appears analysts use more information than the discounted residual income models and price-earnings-growth models alone.

Figure 7-3 Distribution of the residual income valuation metric with fade rate assumption



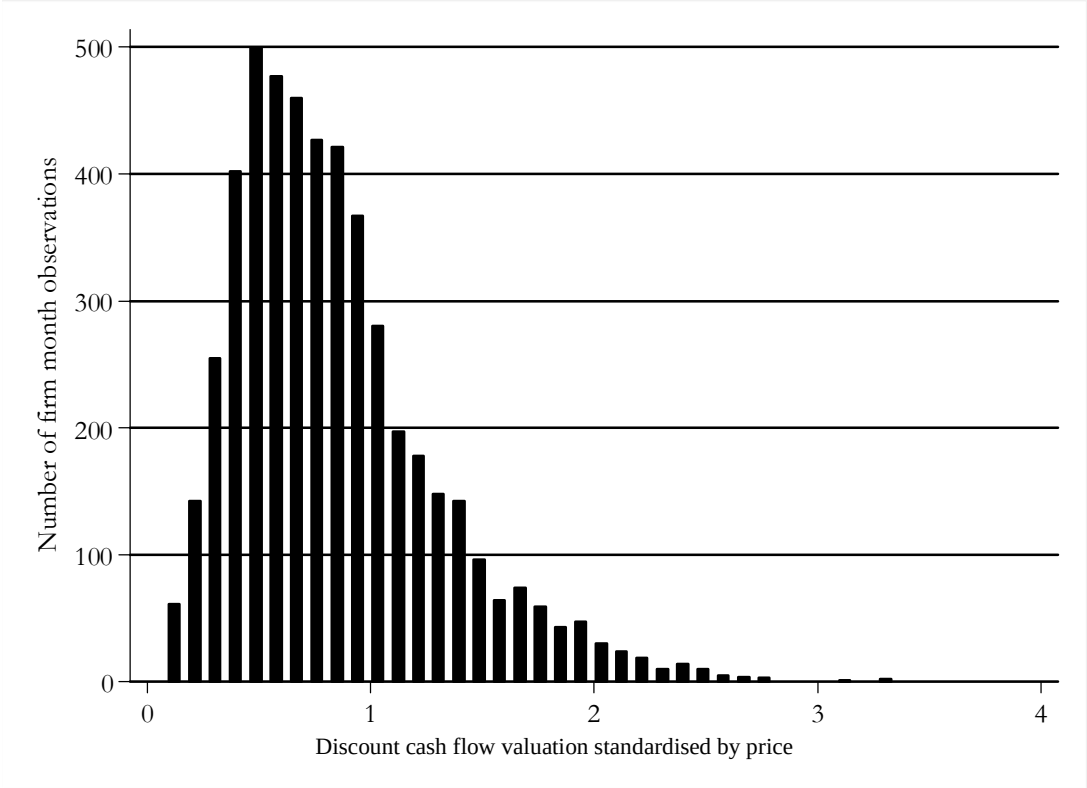
The figure represents the distribution of 4,961 firm month observations for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010 of the price standardised residual income valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast residual income will fade to zero over a period of ten years

Figure 7-4 Distribution of the residual income valuation metric with perpetuity assumption



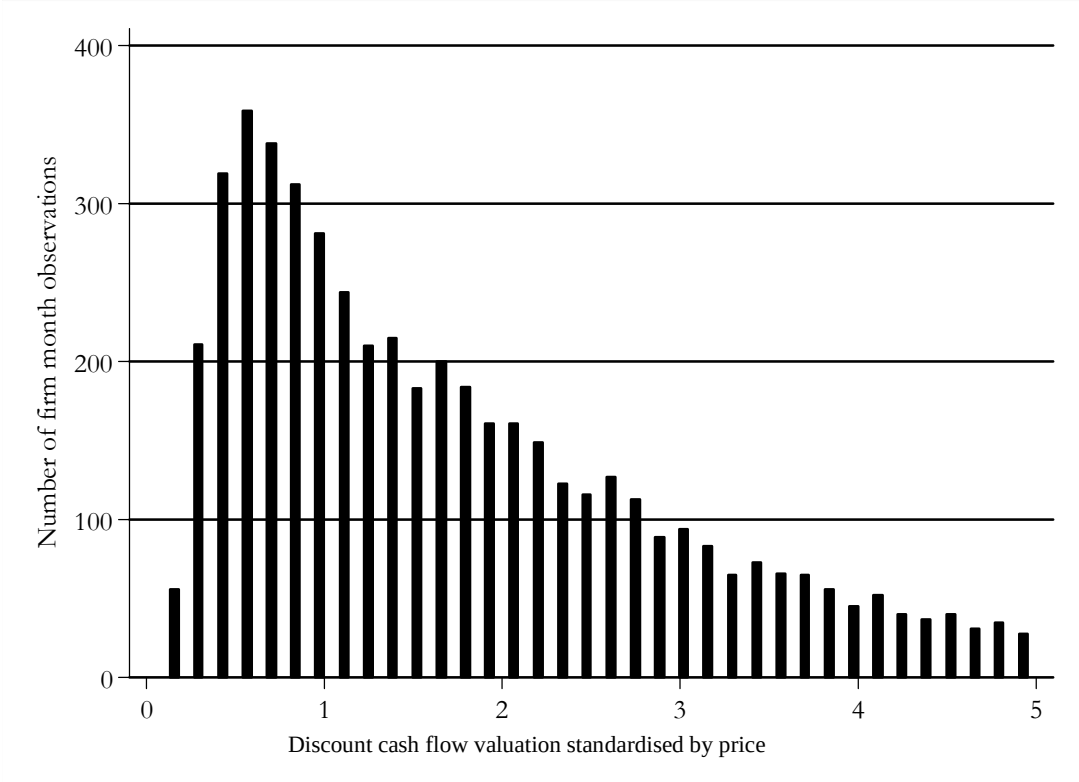
The figure represents the distribution of 4,961 firm month observations for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010 of the price standardised residual income valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast residual income continues in perpetuity

Figure 7-5 Distribution of the discount cash flow valuation metric with fade rate assumption



The figure represents the distribution of 4,961 firm month observations for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010 of the price standardised discounted cash flow valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast cash flows will fade to zero over a period of ten years

Figure 7-6 Distribution of the discount cash flow valuation metric with perpetuity assumption



The figure represents the distribution of 4,961 firm month observations for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010 of the price standardised discounted cash flow valuation calculated using a five year forecast horizon and assuming that, beyond five years, forecast cash flow continues in perpetuity

Price-earnings ratios (PE) range between 20.16 and 16.66 times depending on the use of either historical or analysts forecast earnings as the denominator. These ratios are larger than the equivalent price-cash-flow ratios (Pcf) which range between 14.66 and 11.55 using historical or analysts forecast cash flows. The heuristic measure to examine analysts' use of direct cash flow information (*PDcf*) is 10.09, 31% smaller than the Pcf ratio using historical operating cash flows as the denominator. The average firm in the sample has a long-term earnings growth projection (*LTG*) of 11.41%, market capitalisation of $4.1 billion, book to market ratio (*BM*) of 49%, dividend payout ratio of 64%, and cost of capital of 10%.[65] Comparable statistics reported by Barniv *et al.* (2010) show *LTG* of 11.01% and a *BM* of 61%.

Considered in isolation, the descriptive statistics of the valuation metrics presented in Table 7-4 provide limited insight into their relationship with *REC*. Accordingly, by classifying observations into quintiles based on the level of the analysts' consensus stock recommendation in Table 7-5, relationships between levels of *REC* and the levels of the valuation metrics is more easily identifiable. Moreover, considering the descriptive statistics in Table 7-5 alongside the correlation matrices in Table 7-6 provides further insight into the significance of the relationships between *REC* and the valuation metrics. Consistent with prior research, Table 7-6 shows a significant negative relationship between *VRi1P*, *VRi2P* and *REC*. Moreover, *Vdcf1P* and *Vdcf2P* display a significantly negative correlation with *REC*. This is further shown by the negative monotonic relationship between *REC* in Table 7-5, and the mean values of *VRi1P*, *VRi2P, Vdcf1P* and *Vdcf2P*, which steadily decline, whilst *REC* increases across the quintile groupings.

[65] While all the models are estimated using the derived cost of capital, the results remain unchanged when assuming a fixed rate of 5%, 10%, or 15%.

Table 7-5 Descriptive statistics across recommendation quintile portfolios

	(Sell) 1st quintile (1,103 obs)		2nd quintile (970 obs)		3rd quintile (1,002 obs)		4th quintile (990 obs)		(Strong buy) 5th quintile (896 obs)	
Variable	Mean	Med	Mean	Med	Mean	Med	Mean	Med	Mean	Med
REC	2.87	2.90	3.32	3.30	3.57	3.56	3.80	3.80	4.17	4.17
VRi1P	0.80	0.72	0.73	0.66	0.65	0.60	0.64	0.59	0.60	0.53
VRi2P	1.10	0.86	1.03	0.83	0.96	0.78	0.92	0.74	0.84	0.62
Vdcf1P	0.96	0.85	0.88	0.79	0.80	0.73	0.79	0.71	0.74	0.68
Vdcf2P	1.94	1.68	1.78	1.55	1.65	1.34	1.59	1.29	1.50	1.22
VPeg	0.62	0.50	0.71	0.59	0.81	0.69	0.86	0.72	0.91	0.75
VPcshg	1.01	0.75	1.08	0.85	1.18	0.98	1.25	1.05	1.25	1.04
PEhst	17.25	16.12	18.31	16.96	21.06	18.56	22.13	19.05	22.54	19.77
PE1yr	16.86	15.89	17.94	16.10	19.69	17.38	21.94	17.84	24.48	17.94
PE2yr	14.73	14.17	15.13	14.37	16.37	14.95	17.74	15.33	19.82	15.04
Pcfhst	12.43	11.24	13.44	11.69	16.02	13.33	16.15	13.83	15.54	14.03
Pcf1yr	10.80	10.09	12.15	10.75	13.54	11.80	14.61	12.03	16.81	12.64
Pcf2yr	9.66	9.19	10.42	9.60	11.59	10.53	12.39	10.38	14.11	10.83
PDcf	6.78	7.20	8.66	7.95	10.93	8.83	11.35	9.39	13.41	9.88
LTG	8.30	7.20	10.20	8.15	12.19	10.70	13.12	11.70	13.80	11.84

This table summarises the mean and median sample statistics of the key variables for the 4,961 consensus stock recommendations issued by analysts for 179 Australian companies listed on the ASX300 index between January 2000 and December 2010. Observations are classified into quintiles based on the level of the analysts' consensus stock recommendation. See Table 7-4 for variable definitions.

Table 7-6 Correlation matrix of key variables

Spearman (below the diagonal) and Pearson (above the diagonal) correlations (n=4,961)

	REC	VRi1P	VRi2P	Vdcf1P	Vdcf2P	VPeg	PEhst	PE1yr	PE2yr	VPcshg	Pcfhst	Pcf1yr	Pcf2yr	PDcf	LTG
REC		-0.156	-0.118	-0.110	-0.110	0.206	0.129	0.172	0.164	0.138	0.055	0.206	0.189	0.115	0.245
VRi1P	-0.141		0.790	0.776	0.759	0.113	-0.346	-0.368	-0.416	0.183	-0.209	-0.444	-0.459	-0.172	-0.275
VRi2P	-0.117	0.879		0.538	0.792	0.045	-0.186	-0.245	-0.269	0.073	-0.108	-0.280	-0.281	-0.114	-0.187
Vdcf1P	-0.102	0.809	0.651		0.832	0.140	-0.323	-0.401	-0.471	0.351	-0.286	-0.589	-0.620	-0.206	-0.283
Vdcf2P	-0.101	0.837	0.785	0.910		0.023‡	-0.208	-0.279	-0.322	0.184	-0.207	-0.439	-0.447	-0.154	-0.250
VPeg	0.224	0.058	0.035	0.096	0.008‡		0.077	-0.145	-0.262	0.881	0.077	-0.074	-0.167	0.021‡	0.707
PEhst	0.132	-0.496	-0.292	-0.513	-0.373	0.018‡		0.451	0.409	0.097	0.297	0.403	0.358	0.148	0.459
PE1yr	0.111	-0.548	-0.352	-0.603	-0.436	-0.179	0.773		0.868	-0.115	0.238	0.750	0.743	0.148	0.349
PE2yr	0.066	-0.564	-0.353	-0.645	-0.454	-0.305	0.724	0.924		-0.243	0.191	0.801	0.867	0.119	0.245
VPcshg	0.178	0.148	0.093	0.312	0.182	0.897	-0.005‡	-0.172	-0.299		-0.018‡	-0.214	-0.307	-0.032	0.630
Pcfhst	0.112	-0.448	-0.284	-0.572	-0.435	0.047	0.566	0.487	0.470	-0.131		0.355	0.293	0.114	0.267
Pcf1yr	0.160	-0.584	-0.372	-0.815	-0.607	-0.061	0.630	0.740	0.734	-0.286	0.677		0.928	0.192	0.387
Pcf2yr	0.119	-0.588	-0.370	-0.845	-0.618	-0.137	0.605	0.713	0.775	-0.378	0.650	0.938		0.176	0.312
PDcf	0.166	-0.511	-0.339	-0.597	-0.470	0.080	0.567	0.492	0.469	-0.096	0.783	0.669	0.646		0.150
LTG	0.315	-0.308	-0.201	-0.323	-0.291	0.768	0.460	0.382	0.290	0.677	0.352	0.408	0.351	0.380	

The sample consists of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. Insignificant correlations (two tailed p-value < 0.05), are shown by ‡. See Table 7-4 for variable definitions.

Analysts appear to disregard the results of multi-period valuations, by issuing counterintuitive more/less favourable recommendations for stocks with low/high valuations compared to the current share price, providing initial confirmation of H2.

In contrast, however, the heuristic measures display a significantly positive correlation with *REC* in Table 7-6, along with monotonically positive relationships in Table 7-5, except *Pcfhst*, which, after increasing monotonically through the first four quintiles, falls in the fifth. These descriptive statistics provide initial evidence in support of H1 that analysts predominantly employ valuation heuristics when recommending stocks. Analysts forecast of long-term earnings growth (*LTG)* displays the highest positive correlation with *REC* of 31.5%, consistent with prior studies, and further emphasising the importance placed on *LTG* by analysts when issuing their recommendations. Moreover, Table 7-5 displays *LTG* growing monotonically from 8.3% at the lowest recommendation levels, up to 13.8% at the highest recommendation levels. *VPeg* and *VPcshg* display the second and third highest positive correlations with *REC* of 22.4% and 17.8%, likely driven by the incorporation of *LTG* within the models. *PDcf* and *Pcf1yr* are the last two heuristic measures that are correlated with *REC* at a level greater than 15%, providing initial evidence of the importance given by analysts to historical direct cash flows and their cash flow forecasts when recommending stocks. Between the three PE ratios, the historical PE ratio is most highly correlated with *REC* at 13.2%. By comparison, however, between the three Pcf ratios, the ratio utilising analysts one year cash flow forecast yields the highest correlation with *REC* of 16%. When recommending stocks, analysts appear to place more reliance on historical earnings and estimates of future cash flows, rather than historical cash flows and estimates of future earnings.

7.5 Regression Results

Firm level fixed effects regressions are used to test the relationship between analysts' consensus stock recommendations and the valuation and heuristic measures calculated from Equations (7.1) to (7.9).[66] Moreover, while suppressed from the tabulated results, all the models include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation. Following Bradshaw (2004), Barniv *et al.* (2009), and Barniv *et al.* (2010), all the regressions are estimated by using the quintile rankings of valuation estimates as explanatory variables, which are scaled to range between 0 and 1 (e.g. (Quintile-1)/4).[67] Vuong tests are then used to compare the relative explanatory power between the different models (Bradshaw, 2004).

7.5.1 Analysis of Analysts' Recommendations on Valuation Metrics

The initial analysis, reported in Table 7-7 to Table 7-8, follow Bradshaw (2004), by regressing analysts' consensus stock recommendations on the quintile rankings of each multi-period valuation and heuristic model (VM), calculated using Equations (7.1) to (7.9), as follows:

$$REC = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon \quad (7.10)$$

[66] Untabulated results, of Hausman's (1978) specification test, rejected the null hypothesis of there being no systematic difference between the coefficients of the firm level random effects, and firm level fixed effects models. Accordingly, the firm fixed effects model is chosen as the more efficient estimator of the beta coefficients.

[67] While all the models are estimated using quintile rankings of the independent variables, there is no material effect on any inferences by using the actual, rather than ranked, values for the independent variables.

Where *REC* is the analyst average consensus recommendation, *VM* is the valuation or heuristic model calculated using Equations (7.1) to (7.9), *FE* are firm level fixed effects, and *Controls* include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued.

Regression results of Equation (7.10) are presented in two tables, testing hypotheses H1 and H2. Table 7-7 display the results of multi-period valuation and heuristic models using analysts forecast earnings, historical earnings, and long-term earnings growth forecasts. Meanwhile, Table 7-8 presents the findings from multi-period valuation and heuristic models using analysts forecast cash flows, historical net cash flows, and historical core direct cash flows. Results in Table 7-7 show a significant negative coefficient for *VRi1P*, and no significant relationship between *REC* and *VRi2P*, providing supporting evidence for H2. In contrast, with the exception of the coefficient for *PE2yr*, which is insignificant, all the earnings based heuristic models are related positively, and significantly, to analysts' average consensus recommendation. Moreover, between all the earnings based valuation models, *LTG* has the highest coefficient of 0.271 and R^2 of 18.5%.

Table 7-7 Regression results of consensus recommendation and earnings variables

Panel A: $REC = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	3.493***	3.409***	3.358***	3.395***	3.398***	3.412***	3.354***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VRi1P	-0.136***						
	(0.002)						
VRi2P		-0.054					
		(0.143)					
VPeg			0.186***				
			(0.000)				
PEhst				0.191***			
				(0.000)			
PE1yr					0.114**		
					(0.027)		
PE2yr						0.063	
						(0.267)	
LTG							0.271***
							(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,961	4,961	4,961	4,961	4,961	4,961	4,961
R-Squared	0.163	0.157	0.171	0.171	0.160	0.157	0.185

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
VRi1P	--						
VRi2P	3.5***	--					
VPeg	-1.8*	-3.6***	--				
PEhst	-2.4**	-4.2***	0.1	--			
PE1yr	1.12	-1.7*	2.6***	3.8***	--		
PE2yr	2.8***	0.2	3.7***	4.7***	2.6***	--	
LTG	-4.3***	-5.7***	-4.2***	-2.7***	-5.1***	-5.9***	--

The table presents results of regressions of consensus stock recommendations on the quintile rankings of valuation estimates using analysts' earnings forecasts and quintile rankings of long-term earnings growth projections for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7-8 Regression results of consensus recommendation and cash flow variables

Panel A: $REC = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	3.540***	3.527***	3.387***	3.397***	3.367***	3.393***	3.372***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Vdcf1P	-0.191***						
	(0.001)						
Vdcf2P		-0.180***					
		(0.001)					
VPcshg			0.101**				
			(0.010)				
Pcfhst				0.135***			
				(0.007)			
Pcf1yr					0.243***		
					(0.000)		
Pcf2yr						0.177***	
						(0.004)	
PDcf							0.180***
							(0.001)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,961	4,961	4,961	4,961	4,961	4,961	4,961
R-Squared	0.167	0.168	0.160	0.163	0.175	0.165	0.168

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	Vdcf1P	Vdcf2P	VPcshg	Pcfhst	Pcf1yr	Pcf2yr	PDcf
Vdcf1P	--						
Vdcf2P	-0.4	--					
VPcshg	2.0**	2.1**	--				
Pcfhst	1.3	1.4	-1.1	--			
Pcf1yr	-2.5***	-1.9**	-3.3***	-3.3***	--		
Pcf2yr	1.1	1.1	-1.4	-0.7	3.9***	--	
PDcf	-0.1	0.1	-2.1**	-2.0**	2.0**	-0.8	--

The table presents results of regressions of consensus stock recommendations on the quintile rankings of valuation estimates using analysts' cash flow forecasts and quintile rankings of the direct cash flow cover ratio for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Consistent with Bradshaw (2004), Vuong tests reveal the *LTG* model has the highest explanatory power demonstrating that, out of the earnings based models, analysts predominantly use their long-term earnings growth forecasts when determining their recommendations. Further, while *VPeg* and *PEhst* are ranked as the next two most useful models, they are not statistically different from one another. Although analysts' earnings forecasts are most useful as inputs in the price-earnings growth heuristic, historical earnings, when used in a price-earnings ratio, provide analysts with equally useful information to recommend stocks. Results from Table 7-7 confirm both H1(a) and H2, and are consistent with the findings in prior studies that analysts use their earnings forecasts in heuristic valuations, but not in multi-period residual income models when issuing their stock recommendations.

Regression results in Table 7-8 reveal a significant negative coefficient for both *Vdcf1P* and *Vdcf2P*, providing supporting evidence for H2, that financial analysts do not use their cash flow forecasts as inputs in multi-period valuation models when issuing stock recommendations. All the coefficients from the cash flow based heuristic models are positive and significant at confidence levels above 95%. These findings reveal that analysts do use cash flow information, including their cash flow forecasts, historical cash flows, and direct cash flow components, when issuing their recommendations. Based on the magnitude of the coefficients and the results of the Vuong tests, *Pcf1yr* is by far the dominant cash flow heuristic valuation model, showing a 0.243 increase in analysts' consensus recommendations when moving from the lowest to the highest quintile ranking. Analysts also find direct cash flow information useful when recommending stocks, and significantly more useful than historical net cash flows as evidenced by the significant and positive Vuong statistic of 2.0 when comparing

Pcfhst and *PDcf*. Moreover, the *PDcf* coefficient shows a 0.18 increase in analysts' consensus recommendation, higher than the 0.135 increase from the *Pcfhst* coefficient, when moving from the lowest to the highest quintile ranking. In fact, *PDcf* is only second in ranking to *Pcf1yr* when using Vuong tests to compare the explanatory power of the different cash flow based valuation heuristics. These findings provide strong support for both H1a and H2b, revealing that analysts do issue more/less favourable recommendations for high/low heuristic valuations based on their forecast cash flows or historical core direct cash flow information. Moreover, core direct cash flows provide analysts with incremental information to that contained within net operating cash flows alone, supporting analysts strong preference for direct cash flow statements.

7.5.2 Analysis of Analysts' Recommendations on Valuation Metrics with Further Controls

By using a similar set of control variables to Barniv *et al.* (2010), multivariate regression analysis is performed in addition to the above tests. Consensus stock recommendations are regressed on the quintile rankings of the valuation and heuristic measures calculated using Equations (7.1) to (7.9), along with the quintile rankings of four control variables as follows:

$$REC = \beta_0 + \beta_1 VM + \beta_2 Num + \beta_3 RECSD + \beta_4 Size + \beta_5 BM + \beta_6 Controls + FE + \varepsilon \quad (7.11)$$

Where REC is the analyst average consensus recommendation, VM is the multi-period valuation or heuristic measure calculated using Equations (7.1) to (7.9), FE are firm level fixed effects, and *Controls* include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Following Barniv *et al.* (2010), further control is now

made for analyst following (*Num*), the distribution of analysts' recommendations (*RECSD*), the logarithm of the firms market capitalisation (*Size*), and the book to market ratio (*BM*).

Regression results of Equation (7.11) are presented in two tables, testing hypotheses H1 and H2. Table 7-9 display the results of multi-period valuation and heuristic models using analysts forecast earnings, historical earnings, and long-term earnings growth forecasts. Meanwhile, Table 7-10 presents the findings from multi-period valuation and heuristic models using analysts forecast cash flows, historical net cash flows, and historical core direct cash flows. With the exception of *Num*, which is not significant, the direction of the coefficients on the remaining controls in Table 7-9 and Table 7-10 are consistent with those reported by Barniv *et al.* (2010). Analysts issue more/less favourable recommendations for larger/smaller firms, firms with low/high book to market ratios, and firms with a low/high standard deviation between analysts' recommendations.

Results in Table 7-9, with more controls, are generally consistent with the findings presented in Table 7-7. The coefficients on both residual income valuation models are insignificant, while the coefficients on the heuristic *VPeg, PEhst,* and *LTG* models are all positive and significant. In contrast to the results in Table 7-7, where PE1yr is significant at confidence levels above 95%, both of the price-earnings heuristic models, based on analysts one and two year earnings forecasts, are insignificant, after including additional controls. Analysts clearly make use of their earnings forecasts in a price-earnings growth heuristic, but not in price-earnings ratios, when recommending stocks. Vuong tests show that *LTG* heuristics continue to be ranked of highest importance, followed by *VPeg,* and *PEhst,* when recommending stocks.

Table 7-9 Regression results of consensus recommendations and earnings variables with further controls

Panel A: $REC = \beta_0 + \beta_1 VM + \beta_2 Num + \beta_3 RECSD + \beta_4 Size + \beta_5 BM + \beta_6 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	3.469***	3.456***	3.391***	3.437***	3.438***	3.453***	3.375***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
VRi1P	-0.057						
	(0.181)						
VRi2P		-0.015					
		(0.656)					
VPeg			0.199***				
			(0.000)				
PEhst				0.148***			
				(0.003)			
PE1yr					0.051		
					(0.309)		
PE2yr						-0.019	
						(0.729)	
LTG							0.247***
							(0.000)
Size	0.277***	0.293***	0.336***	0.214**	0.272***	0.312***	0.267***
	(0.007)	(0.004)	(0.001)	(0.033)	(0.006)	(0.002)	(0.005)
BM	-0.168***	-0.188***	-0.190***	-0.176***	-0.182***	-0.193***	-0.159**
	(0.009)	(0.003)	(0.002)	(0.006)	(0.004)	(0.002)	(0.011)
Num	0.081	0.074	0.058	0.090	0.080	0.070	0.076
	(0.193)	(0.234)	(0.332)	(0.130)	(0.184)	(0.254)	(0.200)
RECSD	-0.079***	-0.081***	-0.084***	-0.079***	-0.082***	-0.081***	-0.082***
	(0.006)	(0.004)	(0.002)	(0.005)	(0.004)	(0.004)	(0.003)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,961	4,961	4,961	4,961	4,961	4,961	4,961
R-Squared	0.183	0.182	0.200	0.191	0.183	0.182	0.206

Table 7-9 (continued)

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
VRi1P	--						
VRi2P	1.4	--					
VPeg	-4.2***	-4.7***	--				
PEhst	-3.0***	-3.4***	2.1**	--			
PE1yr	0.3	-0.9	4.4***	3.5***	--		
PE2yr	1.0	0.1	4.8***	3.2***	0.7	--	
LTG	-5.3***	-5.6***	-2.2**	-3.5***	-5.5***	-5.5***	--

The table presents results of regressions of consensus stock recommendations on the quintile rankings of valuation estimates using analysts' earnings forecasts, quintile rankings of long-term earnings growth projections and quintile rankings for control variables for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Regression results of the cash flow based multi-period valuation and heuristic models presented in Table 7-10 are generally consistent with those reported in Table 7-8. Both discounted cash flow valuation models display significantly negative coefficients, revealing no meaningful relationship with analysts' consensus recommendations. In contrast, the *VPcshg*, *Pcf1yr*, and *PDcf* heuristics all display positive and significant coefficients. Unlike the results in Table 7-8, however, the heuristic models based on historical net cash flows or analysts two year forecast cash flows both report insignificant coefficients. These findings once again support the view that direct cash flow statements provide incremental information for decision making to net operating cash flows alone. Moreover, while analysts do use cash flow forecasts when recommending stocks, short term twelve month forecasts are significantly more useful than two year forecast cash flows. Other than the price-cash flow growth model which provides equivalent explanatory power, the price-cash flow model using analysts twelve

month forecast is by far the superior cash flow based heuristic used by analysts when recommending stocks. This contrasts with the use of earnings based heuristics in Table 7-9, which reveal historical price-earnings models provide analysts with more useful information than price-earnings models based on analysts forecast earnings. Taken altogether the findings in both Table 7-9 and Table 7-10, with additional controls, provide consistent evidence with the findings from the less restrictive models, and provide strong support for H1a, H1b, and H2.

7.5.3 Analysis of Changes in Recommendations on Changes in Valuation Metrics

In addition to the models use above, following Bradshaw (2004), H1 and H2 are further examined by regressing the changes in analysts' consensus stock recommendations on the quintile rankings of the changes in the valuation and heuristic measures calculated using Equations (7.1) to (7.9):

$$\Delta REC = \beta_0 + \beta_1 \Delta VM + \beta_2 Controls + FE + \varepsilon \quad (7.12)$$

Where ΔREC is the change in analysts' average consensus recommendation, ΔVM is the change in the multi-period valuation or heuristic measure, *FE* are firm level fixed effects, and *Controls* include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Due to missing lagged measures for *REC* and *VM*, which are required to calculate the dependent and independent variables used in Equation (7.12), 2,072 firm month observations are removed from the sample, leaving 2,889 firm month observations without missing data requirements.

Table 7-10 Regression results of consensus recommendations and cash flow variables with further controls

Panel A: $REC = \beta_0 + \beta_1 VM + \beta_2 Num + \beta_3 RECSD + \beta_4 Size + \beta_5 BM + \beta_6 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	3.514***	3.512***	3.394***	3.454***	3.406***	3.431***	3.413***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Vdcf1P	-0.111*						
	(0.058)						
Vdcf2P		-0.114**					
		(0.024)					
VPcshg			0.135***				
			(0.001)				
Pcfhst				0.074			
				(0.127)			
Pcf1yr					0.179***		
					(0.001)		
Pcf2yr						0.093	
						(0.128)	
PDcf							0.116**
							(0.046)
Size	0.240**	0.240**	0.331***	0.264***	0.203**	0.252**	0.252**
	(0.018)	(0.017)	(0.001)	(0.010)	(0.037)	(0.014)	(0.013)
BM	-0.159**	-0.160**	-0.206***	-0.174***	-0.144**	-0.164***	-0.165***
	(0.014)	(0.013)	(0.001)	(0.005)	(0.021)	(0.010)	(0.009)
Num	0.085	0.083	0.062	0.074	0.094	0.082	0.073
	(0.161)	(0.174)	(0.308)	(0.223)	(0.113)	(0.179)	(0.227)
RECSD	-0.080***	-0.080***	-0.083***	-0.081***	-0.081***	-0.083***	-0.078***
	(0.005)	(0.005)	(0.003)	(0.004)	(0.004)	(0.003)	(0.006)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,961	4,961	4,961	4,961	4,961	4,961	4,961
R-Squared	0.186	0.187	0.190	0.184	0.191	0.184	0.187

Table 7-10 (continued)

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	Vdcf1P	Vdcf2P	VPcshg	Pcfhst	Pcf1yr	Pcf2yr	PDcf
Vdcf1P	--						
Vdcf2P	-1.0	--					
VPcshg	-1.4	-1.0	--				
Pcfhst	0.7	1.2	2.0**	--			
Pcf1yr	-2.6***	-1.9*	-0.4	-2.8***	--		
Pcf2yr	0.9	1.4	1.8*	-0.1	3.5***	--	
PDcf	-0.6	-0.1	1.0	-1.8*	1.7*	-1.3	--

The table presents results of regressions of consensus stock recommendations on the quintile rankings of valuation estimates using analysts' cash flow forecasts, quintile rankings of the direct cash flow cover ratio and quintile rankings for control variables for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Regression results of Equation (7.12) are presented in two tables, testing hypotheses H1 and H2. Table 7-11 displays the results of changes in multi-period valuation and heuristic models using analysts forecast earnings, historical earnings, and long-term earnings growth forecasts. Meanwhile, Table 7-12 presents the findings from changes in multi-period valuation and heuristic models using analysts forecast cash flows, historical net cash flows, and historical core direct cash flows. Consistent with the findings above, the results of the changes for the multi-period residual income, reported in Table 7-11, and discounted cash flow valuation models, reported in Table 7-12, show no meaningful relationship with the changes in consensus recommendations. While the coefficients for $\Delta VRi1P$, $\Delta VRi2P$, $\Delta Vdcf1P$, and $\Delta Vdcf2P$ are all significant at confidence levels above 95%, they are all negative, counterintuitively implying, but consistent with Bradshaw (2004), that analysts issue more/less favourable recommendations for over/under priced stocks.

In line with H1a, the coefficients of the changes in earnings based heuristic models reported in Table 7-11 are all positive. However, while $\Delta PE2yr$ is the only insignificant model, $\Delta PEhst$ and ΔLTG are the only models which are significant at confidence levels above 95%. Increasing $\Delta PEhst$ from the lowest to the highest quintile ranking, results in an overall 0.062 change in analysts' consensus recommendation, higher than the 0.04 change from the ΔLTG coefficient. Analysts clearly increase their recommendation levels in response to positive changes in historical earnings and long-term earnings growth forecasts. Vuong tests show that, $\Delta PEhst$ dominates all other models, with the exception of ΔLTG where there is no significant difference, further emphasising the importance analysts place on these valuation heuristics when recommending stocks.

Table 7-11 Regression results of consensus recommendations changes and changes in earnings variables and long-term growth

Panel A: $\Delta REC = \beta_0 + \beta_1 \Delta VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-0.066*	-0.052	-0.086**	-0.101***	-0.079**	-0.086**	-0.085**
	(0.094)	(0.176)	(0.030)	(0.010)	(0.039)	(0.025)	(0.030)
ΔVRi1P	-0.030**						
	(0.029)						
ΔVRi2P		-0.031**					
		(0.036)					
ΔVPeg			0.024*				
			(0.090)				
ΔPEhst				0.062***			
				(0.000)			
ΔPE1yr					0.026*		
					(0.079)		
ΔPE2yr						0.012	
						(0.391)	
ΔLTG							0.040***
							(0.001)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	2,889	2,889	2,889	2,889	2,889	2,889	2,889
R-Squared	0.025	0.025	0.024	0.031	0.025	0.023	0.027

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	ΔVRi1P	ΔVRi2P	ΔVPeg	ΔPEhst	ΔPE1yr	ΔPE2yr	ΔLTG
ΔVRi1P	--						
ΔVRi2P	-0.1	--					
ΔVPeg	0.3	0.3	--				
ΔPEhst	-2.1**	-1.9*	-1.7*	--			
ΔPE1yr	0.3	0.3	-0.1	2.5**	--		
ΔPE2yr	1.1	1.1	0.5	2.6***	1.1	--	
ΔLTG	-0.5	-0.5	-1.3	1.2	-0.8	-1.4	--

The table presents regression results of the change in analysts' consensus stock recommendations on the quintile rankings of the corresponding change in valuation estimates using analysts' earnings forecasts and quintile rankings of the change in long term earnings growth projections for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7-12 Regression results of consensus recommendations changes and changes in cash flow variables

Panel A: $\Delta REC = \beta_0 + \beta_1 \Delta VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-0.066	-0.068*	-0.078**	-0.105***	-0.096**	-0.086**	-0.110***
	(0.104)	(0.089)	(0.048)	(0.007)	(0.014)	(0.026)	(0.006)
ΔVdcf1P	-0.030**						
	(0.042)						
ΔVdcf2P		-0.033**					
		(0.023)					
ΔVPcshg			0.008				
			(0.591)				
ΔPcfhst				0.064***			
				(0.000)			
ΔPcf1yr					0.034**		
					(0.012)		
ΔPcf2yr						0.041***	
						(0.005)	
ΔPDcf							0.074***
							(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	2,889	2,889	2,889	2,889	2,889	2,889	2,889
R-Squared	0.025	0.026	0.023	0.032	0.026	0.027	0.035

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	ΔVdcf1P	ΔVdcf2P	ΔVPcshg	ΔPcfhst	ΔPcf1yr	ΔPcf2yr	ΔPDcf
ΔVdcf1P	--						
ΔVdcf2P	-0.5	--					
ΔVPcshg	0.9	1.1	--				
ΔPcfhst	-2.2**	-1.9*	-2.3**	--			
ΔPcf1yr	-0.4	-0.1	-1.2	2.2**	--		
ΔPcf2yr	-0.9	-0.6	-1.4	1.8*	-0.7	--	
ΔPDcf	-2.7***	-2.4**	-2.7***	-1.9*	-2.7***	-2.4**	--

The table presents regression results of the change in analysts' consensus stock recommendations on the quintile rankings of the corresponding change in valuation estimates using analysts' cash flow forecasts and quintile rankings of the change in the direct cash flow cover ratio for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results from the changes in cash flow based multi-period valuation and heuristic models reported by Table 7-12 provide further support for the findings already documented in the previous tests. With the exception of $\Delta VPcshg$, all the cash flow based heuristics coefficients are positive and significant at confidence levels above 95%. Moreover, while changes in heuristics based on analysts' cash flow forecasts, $\Delta Pcf1yr$ and $\Delta Pcf2yr$, are positively related to changes in recommendations, supporting H1a, heuristics based on the changes in historical cash flows explain more of the changes in analysts' recommendations. However, in contrast to the results using recommendation and valuation metric levels, but consistent with H1b, Vuong tests show that changes in analysts' consensus recommendations are best explained by changes in the direct cash flow heuristic, $\Delta PDcf$. Changes in historical net operating cash flows, $\Delta Pcfhst$, are the second best cash flow heuristic. These findings provide further strong evidence for the usefulness of direct cash flow information over and above net operating cash flows alone.

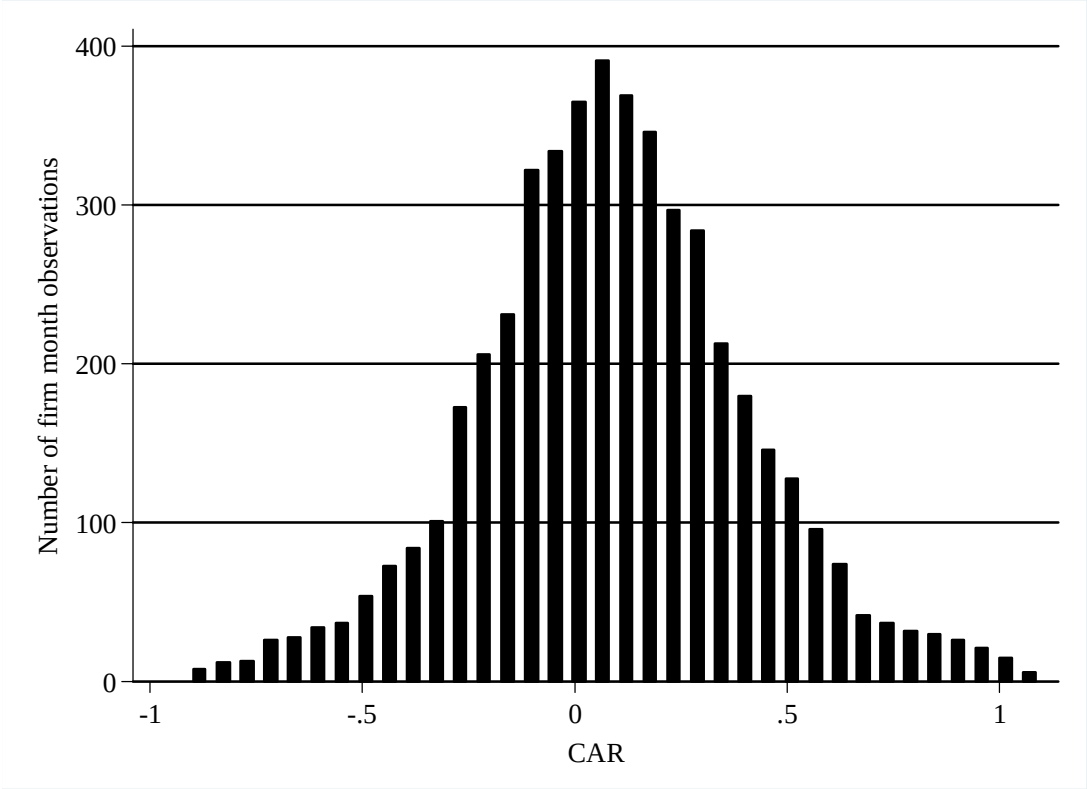
7.5.4 Analysis of Future Excess Returns and Valuation Models

The final analyses, addressing H3, investigates the profitability of identifying mispriced stocks by following analysts' recommendations or heuristic valuations compared to buy-and-hold investors exploiting analysts' earnings and cash flow forecasts in multi-period valuation models. Market and size adjusted future returns are used as the dependent variables to capture future buy-and-hold excess returns. Although prior studies generally use size-adjusted returns, market adjusted returns are also used in this chapter since the sample is comprised of only those firms listed on the ASX300 index. Future buy-and-hold one-year market-adjusted returns (*CAR*) are calculated as follows:

$$CAR_i = \left[\prod_{t=1}^{260} (1 + r_{it}) - \prod_{t=1}^{260} (1 + r_{asx300,t}) \right] \tag{7.13}$$

Where r_{it} is the daily raw stock return for firm i, $r_{asx300,t}$ is the daily return of the ASX300 stock index, and CAR_i is the sum of the excess returns cumulated over a one year period commencing from the 15th day of the month following the stock recommendation announcement (Bradshaw, 2004). *CAR* has a mean/median value of 9%/8% respectively and a normal distribution as shown by Figure 7-7.

Figure 7-7 Distribution of cumulative annual market adjusted stock returns (CAR)



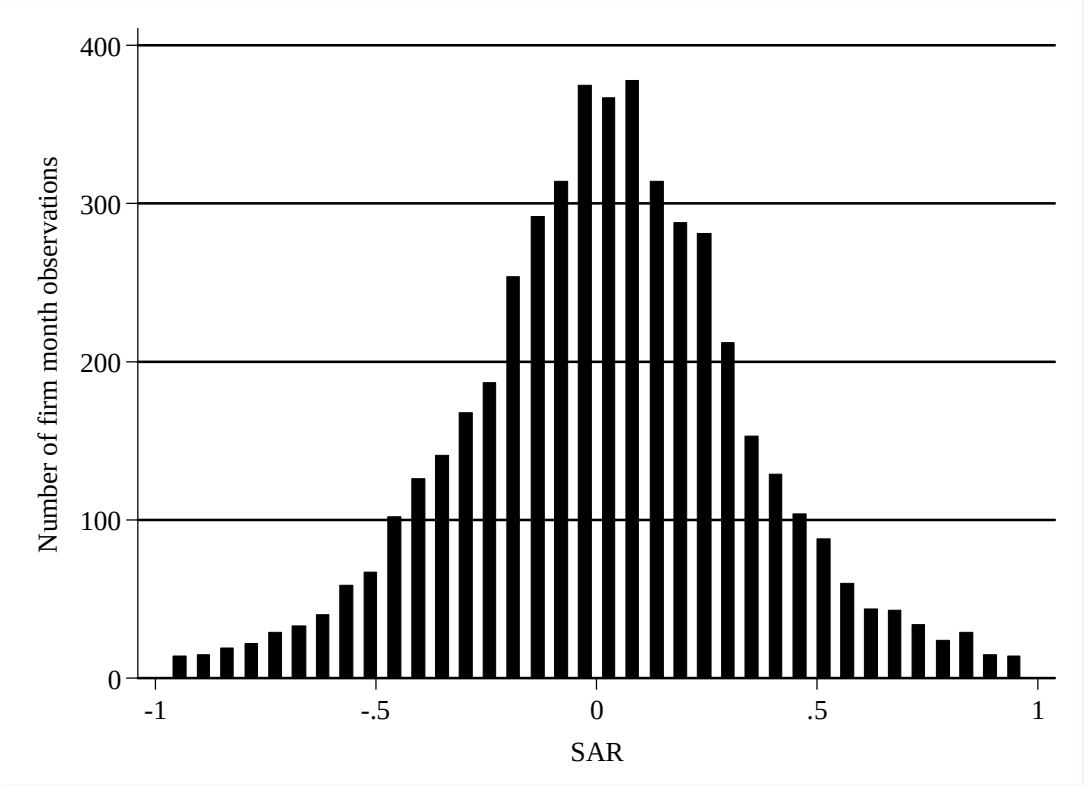
The figure represents the distribution of the cumulative annual market adjusted stock returns (CAR) for 4,834 firm month observations from 179 Australian companies listed on the ASX300 index between January 2000 and December 2010.

Future buy-and-hold one-year size-adjusted returns (*SAR*) are calculated using Equation (7.14):

$$SAR_i = \left[\prod_{t=1}^{260} (1 + r_{it}) - \prod_{t=1}^{260} (1 + r_{size,t}) \right] \quad (7.14)$$

Where r_{it} is the daily raw stock return for firm i, $r_{size,t}$ is the daily return of the size quartile to which firm *i* belongs at the start of the fiscal year, and SAR_i is the sum of the excess returns cumulated over a one year period commencing from the 15th day of the month following the stock recommendation announcement. S*AR*, which has a mean and median value of 2%, is normally distributed as shown in Figure 7-8.

Figure 7-8 Distribution of cumulative annual size adjusted stock returns (SAR)



The figure represents the distribution of the cumulative annual size adjusted stock returns (SAR) for 4,834 firm month observations from 179 Australian companies listed on the ASX300 index between January 2000 and December 2010.

Employing a similar model to Bradshaw (2004), the excess returns calculated in Equations (7.13) and (7.14) are now each used as the dependent variable in the following regression:

$$Ret = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon \quad (7.15)$$

Where *Ret* is the buy-and-hold one-year market-adjusted (CAR_i) or size-adjusted (SAR_i) excess returns calculated using either Equation (7.13) or Equation (7.14). *VM* is the multi-period valuation or heuristic model calculated using Equations (7.1) to (7.9), *FE* are firm level fixed effects, and *Controls* include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Regression results of Equation (7.15) are presented in four tables. Results of the future excess market-adjusted returns are shown in Table 7-13 and Table 7-15, while the results of future excess size-adjusted returns are reported in Table 7-14 and Table 7-16. Results of the earnings based multi-period valuation and heuristic models, and the long-term earnings growth forecasts are presented in Table 7-13 and Table 7-14, while Table 7-15 and Table 7-16 present the findings from the cash flow valuation and heuristic models. Vuong tests are used to compare the explanatory power between the different models and are reported in Panel B of each table. Finally, Vuong tests are used to compare the explanatory power between the earnings and cash flow valuation and heuristic models, and are presented in Table 7-17.

Table 7-13 Regression results of one-year-ahead market adjusted returns on consensus recommendations, earnings variables, and long term growth

Panel A: $CAR = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.049	-0.032	0.002	0.058	0.100***	0.107***	0.112***	0.091**
	(0.197)	(0.390)	(0.947)	(0.118)	(0.006)	(0.004)	(0.003)	(0.012)
REC	-0.036							
	(0.227)							
VRi1P		0.137***						
		(0.000)						
VRi2P			0.067**					
			(0.013)					
VPeg				-0.060*				
				(0.054)				
PEhst					-0.197***			
					(0.000)			
PE1yr						-0.185***		
						(0.000)		
PE2yr							-0.194***	
							(0.000)	
LTG								-0.154***
								(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,834	4,834	4,834	4,834	4,834	4,834	4,834	4,834
R-Squared	0.117	0.129	0.120	0.118	0.144	0.137	0.137	0.132

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	REC	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
REC	--							
VRi1P	-3.6***	--						
VRi2P	-1.5	4.0***	--					
VPeg	-1.1	2.6***	0.5	--				
PEhst	-5.6***	-3.2***	-5.0***	-4.9***	--			
PE1yr	-5.0***	-2.2**	-4.6***	-4.2***	1.6	--		
PE2yr	-5.1***	-2.3**	-4.7***	-4.1***	1.5	-0.1	--	
LTG	-4.3***	-0.8	-3.2***	-4.8***	2.3**	1.1	1.1	--

The table presents regression results of the one-year-ahead market adjusted returns on the quintile rankings of analysts' consensus stock recommendations and valuation estimates using analysts' earnings forecasts, and quintile rankings of long term earnings growth projections for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models. See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7-14 Regression results of one-year-ahead quartile size adjusted returns on consensus recommendations, earnings variables, and long term growth

Panel A: $SAR = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	-0.021	-0.100***	-0.071*	-0.007	0.028	0.032	0.034	0.019
	(0.588)	(0.009)	(0.057)	(0.861)	(0.458)	(0.403)	(0.386)	(0.616)
REC	-0.032							
	(0.279)							
VRi1P		0.138***						
		(0.000)						
VRi2P			0.079***					
			(0.001)					
VPeg				-0.069**				
				(0.023)				
PEhst					-0.184***			
					(0.000)			
PE1yr						-0.168***		
						(0.000)		
PE2yr							-0.170***	
							(0.000)	
LTG								-0.143***
								(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,834	4,834	4,834	4,834	4,834	4,834	4,834	4,834
R-Squared	0.129	0.142	0.134	0.132	0.154	0.146	0.145	0.143

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	REC	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
REC	--							
VRi1P	-3.8***	--						
VRi2P	-2.2**	3.6***	--					
VPeg	-1.5	2.4**	0.7	--				
PEhst	-5.4***	-2.6***	-4.3***	-4.4***	--			
PE1yr	-4.7***	-1.3	-3.5***	-3.3***	1.9*	--		
PE2yr	-4.5***	-1.1	-3.3***	-3.1***	2.1**	0.5	--	
LTG	-4.1***	-0.3	-2.3**	-4.3***	2.2**	0.8	0.5	--

The table presents regression results of the one-year-ahead quartile size adjusted returns on the quintile rankings of analysts' consensus stock recommendations and valuation estimates using analysts' earnings forecasts, and quintile rankings of long term earnings growth projections for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models.See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results from Table 7-13 and Table 7-14 show insignificant coefficients for *REC*, corroborating findings of earlier studies that show buy-and-hold investors fail to earn positive excess annual stock returns by following analysts' consensus stock recommendations. However, coefficients on *VPeg*, *PEhst*, *PE1yr*, *PE2yr*, and *LTG* are all negative and, with the exception of *VPeg* in Table 7-13, significant at confidence levels above 95%. While analysts find earnings based valuation heuristics useful when issuing their stock recommendations, buy-and-hold investors fail to earn significant positive excess annual returns by using earnings based valuation heuristics and long-term earnings growth predictions to identify mispriced stocks. Conversely, coefficients for *VRi1P* and *VRri2P* are both positive and significant at confidence levels above 95%. Consistent with prior studies (e.g., Bradshaw, 2004; Barniv *et al.*, 2009; Barniv *et al.*, 2010), buy-and-hold investors do earn significant positive excess annual returns by identifying mispriced securities using analysts' earnings forecasts in residual income models.

Interpreting the Vuong tests reported in Panel B of Table 7-13 and Table 7-14 should be done with caution. For example, while the test statistics imply that *PEhst* model has the greatest explanatory power for future excess returns, the coefficients for *PEhst* are significantly negative at confidence levels above 95%. Effectively this shows that buy-and-hold investors using *PEhst* to identify mispriced securities earn annual returns that are significantly below the average returns of the market and size portfolio. Accordingly, while Vuong test statistics are shown for all models, the interpretation of these statistics is limited to those models with positive coefficients, showing that *VRi1P* is significantly more profitable for buy-and-hold investors than *VRri2P*.

Findings from the cash flow valuation and heuristic models are reported in Table 7-15 and Table 7-16 and show significantly positive coefficients for *Vdcf1P* and *Vdcf2P* at confidence levels above 95%. Conversely, with the exception of *VPcshg*, coefficients for all the cash flow based heuristic measures are negative and highly significant. These findings affirm H3 and are consistent with the earnings models reported in Table 7-13 and Table 7-14. Buy-and-hold investors can earn future excess annual returns by identifying mispriced securities using analysts' earnings or cash flow forecasts in multi-period models. However, relying on simple heuristics to identify mispriced stocks can lead buy-and-hold investors to earn returns that are significantly below the average market and size portfolio returns. Once again restricting the analysis of the Vuong tests reported in Panel B of Table 7-15 and Table 7-16 to those models with positive coefficients, the results show that identifying mispriced securities using *Vdcf1P* is significantly more profitable for buy-and-hold investors than *Vdcf2P*.

Table 7-15 Regression results of one-year-ahead market adjusted returns on cash flow variables

Panel A: $CAR = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-0.091**	-0.059	0.054	0.096**	0.120***	0.103***	0.119***
	(0.032)	(0.138)	(0.152)	(0.013)	(0.003)	(0.005)	(0.002)
Vdcf1P	0.215***						
	(0.000)						
Vdcf2P		0.164***					
		(0.000)					
VPcshg			-0.047				
			(0.161)				
Pcfhst				-0.192***			
				(0.000)			
Pcf1yr					-0.234***		
					(0.000)		
Pcf2yr						-0.228***	
						(0.000)	
PDcf							-0.243***
							(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,834	4,834	4,834	4,834	4,834	4,834	4,834
R-Squared	0.142	0.134	0.117	0.143	0.147	0.144	0.154

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	Vdcf1P	Vdcf2P	VPcshg	Pcfhst	Pcf1yr	Pcf2yr	PDcf
Vdcf1P	--						
Vdcf2P	3.3***	--					
VPcshg	4.6***	3.8***	--				
Pcfhst	-0.2	-1.8*	-5.0***	--			
Pcf1yr	-1.3	-3.0***	-5.5***	-0.9	--		
Pcf2yr	-0.5	-2.4**	-5.0***	-0.1	1.2	--	
PDcf	-2.1**	-3.6***	-6.1***	-2.6**	-1.2	-1.9*	--

The table presents regression results of the one-year-ahead market adjusted returns on the quintile rankings of valuation estimates using analysts' cash flow forecasts and quintile rankings of the direct cash flow cover ratio for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models.

See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7-16 Regression results of one-year-ahead quartile size adjusted returns on cash flow variables

Panel A: $SAR = \beta_0 + \beta_1 VM + \beta_2 Controls + FE + \varepsilon$

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-0.158***	-0.124***	-0.011	0.021	0.039	0.028	0.040
	(0.001)	(0.003)	(0.768)	(0.594)	(0.351)	(0.456)	(0.319)
Vdcf1P	0.206***						
	(0.000)						
Vdcf2P		0.159***					
		(0.000)					
VPcshg			-0.052				
			(0.103)				
Pcfhst				-0.171***			
				(0.000)			
Pcf1yr					-0.208***		
					(0.000)		
Pcf2yr						-0.205***	
						(0.000)	
PDcf							-0.223***
							(0.000)
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
n	4,834	4,834	4,834	4,834	4,834	4,834	4,834
R-Squared	0.153	0.146	0.130	0.150	0.153	0.151	0.161

Panel B: Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	Vdcf1P	Vdcf2P	VPcshg	Pcfhst	Pcf1yr	Pcf2yr	PDcf
Vdcf1P	--						
Vdcf2P	3.0***	--					
VPcshg	4.4***	3.6***	--				
Pcfhst	0.5	-1.0	-4.3***	--			
Pcf1yr	-0.2	-1.9*	-4.6***	-0.7	--		
Pcf2yr	0.5	-1.5	-4.3***	-0.2	0.8	--	
PDcf	-1.5	-2.9***	-5.5***	-2.7***	-1.5	-2.0**	--

The table presents regression results of the one-year-ahead quartile size adjusted returns on the quintile rankings of valuation estimates using analysts' cash flow forecasts and quintile rankings of the direct cash flow cover ratio for the sample of 179 publicly traded Australian firms included on the ASX 300 index between January 2000 and December 2010. The quintiles rankings are scaled to range between 0 and 1 (e.g. (Quintile-1)/4). The estimated coefficients are reported after controlling for firm level fixed effects, and include controls for the industry classification, year, and the number of months prior to the next financial year, in which the stock recommendation was issued. Standard errors are adjusted for firm level clustering, and are robust to heteroskedasticity and autocorrelation.

Panel B presents the results of the Vuong tests, which compare the relative explanatory power among the valuation and heuristic models.

See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Finally, the profitability of using residual income models compared to discounted cash flow valuation models are presented in Table 7-17. Results of the Vuong tests show that buy-and-hold investors earn significantly higher excess returns by identifying mispriced securities using discounted cash flow valuation models, *Vdcf1P* and *Vdcf2P*, as compared to using residual income valuation models, *VRi1P* or *VRri2P*. Using analysts forecast cash flows in a discounted cash flow valuation with a five-year horizon, assuming a terminal value with a fade rate, is the most profitable of all the multi-period models. Increasing *Vdcf1P* from the lowest to the highest quintile ranking reported in Table 7-15 and Table 7-16 results in an overall increase in excess annual returns of between 20.6% and 21.5%. Conversely, increasing *VRi1P* from the lowest to the highest quintile ranking reported in Table 7-13 and Table 7-14 results in an overall increase in excess annual returns of around 13.7%. Moreover, untabulated t-tests show discounted cash flow coefficients are significantly greater than the residual income coefficients at confidence levels above 99%.

Table 7-17 Vuong test results comparing the power of earnings versus cash flow based valuation models when explaining one-year-ahead excess returns

Panel A: Market Adjusted Returns Models Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	REC	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
Vdcf1P	-5.2***	-3.6***	-5.2***	-4.4***	0.5	-1.0	-1.0	-1.7**
Vdcf2P	-4.4***	-1.8*	-4.4***	-3.5***	2.0**	0.8	0.8	-0.4
VPcshg	-0.4	3.0***	1.1	1.5	5.2***	4.6***	4.6***	4.9***
Pcfhst	-5.5***	-2.9***	-4.8***	-4.7***	0.3	-1.1	-1.1	-2.0*
Pcf1yr	-6.0***	-4.2***	-5.8***	-5.3***	-0.5	-2.5**	-2.4**	-2.7***
Pcf2yr	-5.6***	-3.6***	-5.3***	-4.8***	0.2	-1.5	-1.6*	-2.1**
PDcf	-6.5***	-4.5***	-6.0***	-6.0***	-1.7*	-2.9***	-2.9***	-3.6***

Panel B: Size Adjusted Returns Models Vuong Tests Vuong Tests (positive statistics indicate the model named in the column has greater explanatory power than the model named in the intersecting row)

Model	REC	VRi1P	VRi2P	VPeg	PEhst	PE1yr	PE2yr	LTG
Vdcf1P	-5.1***	-3.1***	-4.7***	-4.0***	0.2	-1.5	-1.9*	-1.9*
Vdcf2P	-4.5***	-1.4	-3.9***	-3.2***	1.6	0.1	-0.2	-0.7
VPcshg	-0.8	3.0***	1.4	1.9*	4.9***	3.9***	3.7***	4.5***
Pcfhst	-4.9***	-1.9*	-3.7***	-3.9***	0.7	-0.9	-1.1	-1.5
Pcf1yr	-5.4***	-2.9***	-4.5***	-4.3***	0.1	-2.0**	-2.2**	-2.2**
Pcf2yr	-5.2***	-2.5**	-4.2***	-4.0***	0.5	-1.4	-1.8*	-1.7*
PDcf	-6.1***	-3.7***	-5.1***	-5.2***	-1.4	-2.9***	-3.0***	-3.2***

The table present Vuong test results when comparing the power of earnings versus cash flow based valuation models when explaining One-Year-Ahead Excess Returns. Panel A presents findings of the Vuong tests for the regression results of the one-year-ahead market adjusted returns on the quintile rankings of valuation estimates in Table 7-13 and Table 7-14. Panel B presents findings of the Vuong tests for the regression results of the one-year-ahead quartile size adjusted returns on the quintile rankings of valuation estimates in Table 7-15 and Table 7-16.
See Table 7-4 for variable definitions. Two-tailed p-values are presented in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

7.6 Discussion and Conclusion

This study investigates the relationship between analysts' stock recommendations and their earnings and cash flow forecasts, in addition to the relationship between analysts' recommendations and historical direct cash flow information. While prior studies find analysts use simple heuristic models based on their earnings forecasts to identify mispriced securities, to date, no research has examined whether analysts also use their cash flow forecasts in a similar manner. Sloan (1996) shows that historically reported

cash flows provide investors with valuable information to identify mispriced stocks. Moreover, while forecasting both earnings and cash flows is a relatively new and growing trend among analysts, DeFond and Hung (2003) find that analysts cash flow forecasts provide value relevant information to investors. Accordingly, this study predicts that analysts' cash flow forecasts should provide analysts and investors with useful information to identify mispriced securities.

Currently, the IASB and FASB have both proposed to mandate the use of direct cash flow statements as part of their convergence project. This proposal has generated much debate around the associated costs and benefits of reporting direct cash flow statements, with financial analysts being one of the main proponents of this approach. 63% of surveyed analysts agreed or strongly agreed that direct cash flow statements provided them with more useful information for forecasting future cash flows than an indirect cash flow statement (CFA Institute, 2009). Further, prior studies show information from direct cash flow statements is value relevant (Clinch *et al.*, 2002), and helps improve the accuracy of cash flow and earnings predictions (Krishnan and Largay III, 2000; Arthur *et al.*, 2010). Accordingly, this study also predicts that historical direct cash flow information will provide analysts with useful information when issuing their stock recommendations.

Confirming the findings of prior studies, the results show a positive (negative) relationship between analysts' stock recommendations and heuristics (residual income valuation) models based on their earnings forecasts. In contrast, but also consistent with prior research, the results show a positive (negative) relationship between excess annual stock returns and residual income valuation (heuristics) models based on analysts' earnings forecasts. Taken together, these results show that analysts' earnings forecasts

provide useful information to help identify mispriced securities, but only when used in multi-period valuation models. Although analysts appear to use their earnings forecasts in simple heuristics when issuing their stock recommendations, buy-and-hold investors fail to earn excess annual stock returns when following these recommendations or heuristic models.

Investigating the usefulness of analysts' cash flow forecasts and direct cash flow information, the chapter demonstrates a positive (negative) relationship between analysts' stock recommendations and heuristics (discounted cash flow valuation) models based on their cash flow forecasts. Moreover, this chapter demonstrates a positive relationship between analysts' stock recommendations and the heuristic based on historical direct cash flows. Analysts not only disregard the results of multi-period residual income valuation models, they also disregard the results of discounted cash flow models, when setting their recommendations. Consequently, buy-and-hold investors are better off using analysts' cash flow forecasts in multi-period discounted cash flow models to identify mispriced securities compared to relying on their stock recommendations. Moreover, compared to the profitability of using residual income valuation models, the results demonstrate that buy-and-hold investors can earn significantly higher excess annual returns by identifying mispriced stocks using discounted cash flow techniques based on analysts' cash flow forecasts.

Overall, the results not only support the usefulness of analysts' earnings forecasts, but they also provide the first empirical evidence of the usefulness of analysts' cash flow forecasts when identifying mispriced securities. Moreover, they provide the first evidence that analysts find direct cash flow information useful when issuing their stock recommendations, which may be added to the findings from the growing number of

papers investigating the usefulness of direct cash flow statements. However, consistent with prior studies, analysts apparently fail to use their forecasts in multi-period valuation models, rather relying on simple valuation heuristics when identifying mispriced securities. Consequently, based on buy-and-hold investors' potential to earn excess annual returns, analysts fail to identify correctly mispriced securities. To earn the greatest excess annual returns, buy-and-hold investors should make use of analysts' forecasts in multi-period valuation models to identify mispriced securities, particularly analysts' cash flow forecasts.

8 Conclusion

8.1 Background to the Thesis

The International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) are currently proposing that direct cash flow statements should become mandatory for all firms under their harmonised cash flow reporting requirements. While the IASB and FASB are yet to make a decision on the mandatory use of direct cash flow statements, if it is decided that only direct cash flow statements are to be allowed, such a decision would affect cash flow reporting across most of the world. To date, however, whilst prior empirical studies show strong evidence for the usefulness of direct cash flow statements, no research has examined whether this still holds under IFRS. Given the significant changes made to financial reporting with the introduction of IFRS, before a decision is made to mandate direct cash flow statements, the IASB and FASB should understand whether direct cash flow statements are useful in an IFRS reporting framework.

The purpose of this thesis was, therefore, to understand whether or not direct cash flow statements are useful sources of information in an IFRS reporting environment. To undertake this analysis, this thesis examined direct cash flow statements in Australia before and after IFRS adoption. Australia was chosen specifically as one of the few countries where the reporting of direct cash flow statements was mandatory, and the early adoption of IFRS was prohibited.

To examine the usefulness of direct cash flow statements in an IFRS environment, this thesis examined three research questions. In doing so, this thesis provides the first evidence as to whether the proposed mandating of direct cash flow statements may improve the informational environment under IFRS. The three research questions are: (i) Are direct cash flow statements value relevant under IFRS? (ii) Do financial analysts use information from direct cash flow statements when forecasting cash flows and is this information more useful under IFRS? (iii) Do financial analysts use information from direct cash flow statements when issuing their stock recommendations?

8.2 Summary of Findings

8.2.1 Direct Cash Flow Statements Increase in Value Relevance under IFRS

Chapter 5 provides strong evidence that direct cash flow statements are a value relevant disclosure under both Australian GAAP (AGAAP) and IFRS for both industrial and extractive firms. Moreover, and fundamentally for answering the overarching research question of this thesis, for industrial firms the findings reveal that there has been an increase in the value relevance of direct cash flows since the adoption of IFRS. In addition, 'core' and 'non-core' cash flow disclosures are found to increase in value relevance for industrial firms under IFRS. Consequently, if the IASB were to mandate direct cash flow statements it would, in all likelihood, provide users of accounts with a valuable incremental source of information.

The observed increase in value relevance for industrial firms under IFRS is also consistent with increased uncertainty around the accounting numbers that are being disclosed. Based upon the evidence of Bissessur and Hodgson (2011), the move to IFRS created a degree of uncertainty in the accounting numbers being disclosed. In particular,

and consistent with Chalmers *et al.* (2010), for industrial firms, the findings provides evidence that IFRS has resulted in a loss of value relevant information regarding intangibles. As a result, an increase in the value relevance of direct cash flow numbers is unsurprising in times of uncertainty.

8.2.2 Direct Cash Flow Statements Provide Financial Analysts Useful Information for Forecasting Cash Flows

Chapter 6 provides strong evidence that financial analysts use information from direct cash flow statements when estimating future cash flows under both AGAAP and IFRS, but more so since the adoption of IFRS. Moreover, there is a significant improvement in the accuracy of analysts' cash flow predictions post-IFRS, which is likely a result of financial analysts finding information about direct cash flow components significantly more useful under IFRS.

Taken together, these findings support opinions of analysts that the information in a direct cash flow statement is useful when estimating future cash flows, and are consistent with IFRS improving analysts' information environment. By requiring the use of direct cash flow statements, FASB and the IASB would be providing financial analysts with useful information, which in turn would provide investors with more accurate cash flow predictions on which to base their investment decisions.

8.2.3 Direct Cash Flow Statements Provide Financial Analysts and Buy-and-Hold Investors Useful Information to Identify Mispriced Securities

The final empirical chapter starts by showing that, consistent with prior studies, analyst earnings forecasts provide useful information to help identify mispriced securities when used in multi-period valuation models. By adapting these models, Chapter 7 further

shows that, when used in discounted cash flow valuation models, analyst cash flow forecasts provide useful information to help identify mispriced stocks. However, consistent with prior studies, analysts seemingly fail to use these multi-period valuation models, relying rather on simple valuation heuristics to identify mispriced securities. While financial analysts do use their earnings forecasts, cash flow forecasts, and direct cash flow information, when setting their stock recommendations, buy-and-hold investors are better off identifying mispriced securities by using multi-period valuation models. Moreover, compared to the profitability of using residual income valuation models, the results demonstrate that buy-and-hold investors can earn significantly higher excess annual returns by identifying mispriced stocks using discounted cash flow techniques based on analysts' cash flow forecasts.

Overall, the results provide the first empirical evidence of how analysts' cash flow forecasts can provide useful information to identify mispriced securities when used in discounted cash flow valuation models. Moreover, they provide the first evidence that financial analysts do use direct cash flow information when issuing their stock recommendations.

8.3 Policy Implications and Direction for Further Research

In sum, these results provide strong support for the current IASB/FASB proposal to mandate the use of direct cash flow statements and are consistent with IFRS improving the quality of the accounting information environment. Given that, to date, the IASB and FASB have no empirical evidence of the usefulness of direct cash flow statements under IFRS, this thesis presents a valuable contribution towards the on-going debate of whether direct cash flow statements should be a mandatory reporting requirement.

While this thesis shows that analysts use information from direct cash flow statements when forecasting future cash flows, both under AGAAP and under IFRS, there is further scope to examine the predictive power of direct cash flow components by using random walk models. Prior studies have found direct cash flow components increase the accuracy and predictive power of random walk models, but to date these studies have been conducted on samples where disclosure is solely under local GAAP. Given the significant changes brought about since the adoption of IFRS, a direction for further research would be to examine the accuracy and predictive power of direct cash flow components using random walk models under IFRS. Moreover, while this thesis used a variety of metrics to evaluate the usefulness of direct cash flow statements, there is scope for additional research to consider further metrics, such as stock returns and analysts' target prices, when evaluating the usefulness of direct cash flow information under IFRS.

One further factor that must be acknowledged is the sample period of the study, as it includes one of the biggest periods of uncertainty in recent times, namely the financial crisis. As a result, a continued reliance on direct cash flow numbers is unsurprising in such volatile times as it would be logical to assume that users of financial information focus on the 'hard' numbers in the annual report more when making investment decisions. Whether the usefulness of direct cash flow numbers persists beyond the current market turmoil would merit investigation in the future. Despite this, the findings in this thesis present strong evidence that direct cash flow disclosures are useful in an IFRS reporting environment and provide users of financial accounts with a valuable source of incremental information.

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