The value relevance of comprehensive income and components for industrial firms

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Abstract

The tentative decisions under International Accounting Standards Reporting Comprehensive Income (Performance Reporting) (IAS Plus 2004c) require several items that are noncore business to be included as comprehensive income. Using data from Australian firms we replicate the IAS adjustments and use linear and non-linear association regressions to test value relevance of these components. Essentially, our study provides a market test of the Maines and McDaniel (2000) hypothesis that the inclusion of noncore operations in comprehensive income may introduce extraneous noise for investors as a single class. We find evidence that the incorporation of revaluations of non-current operating assets and the non-reporting of extraordinary items in comprehensive income significantly reduces value relevance, with net income from ordinary operations the dominant valuation metric. Our results are consistent with the argument that temporary income and capital adjustment components should be identified and reported separately in flow and stock accounts in order to signal relative importance to investors. We also raise the questions about whether the IAS should uniformly accept the financial concept of capital.

Key Words: comprehensive income, noisy presentation formats, noncore income components

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1. Introduction

In this paper we use linear and non-linear association study techniques to evaluate firm relative performance, as reflected in stock returns, of the comprehensive income measure proposed under International Accounting Standards (IAS Plus 2004c) compared to ordinary net income. We also examine the components of comprehensive income concentrating on extraordinary items (proposed to be dropped) and fair value adjustment components (required to be reported as income) to see if they add to the value relevance of net income. Australian data that currently incorporates fair value adjustments and potentially reflects the comprehensive income adjustments that will occur, if the IAS Plus 2004c is adopted, is used in our tests.

The reporting of traditional accounting income is a noisy representation of economic income. Much of the accounting research and accounting standard setting has revolved around moving noisy accounting representations towards ideal measures that provide more information on the underlying microeconomics of the firm. The debate concerning comprehensive income is an example. The issue of whether accounting income should be reported on a comprehensive clean surplus basis, or whether net income from core operations should be retained with non-operating dirty surplus flows accounted for directly in reserves, has been ongoing over the last seven decades (Paton 1934, May 1937, Dhaliwal, Subramanyam and Trezevant 1999, O'Hanlan and Pope 1999, Cahan et al. 2000). Recently, the International Accounting Standards Board (IASB) has raised the intensity by releasing a number of tentative decisions on its agenda project Reporting Comprehensive Income (Performance Reporting) (IAS Plus 2004c).

The IASB decisions have a number of major implications. First, income will be conceptually all inclusive and reported in a single comprehensive performance statement. Separate statements of recognized gains and losses (as in the UK), and comprehensive income approaches that allow flexibility in reporting value changes as profits or reserve adjustments (as in the US) will not be allowed. Second, profit and revenue recognition has been linked to timely recognition and the fair value approach has been adopted as a working principle. The approach taken is to focus on the change in value of assets and liabilities rather than the completion of an earnings process (IAS Plus, 2004b). This means that changes in the fair value of assets and liabilities would be recognized immediately as they occur and reported as a component of comprehensive income. Finally, extraordinary items will be abolished and subsumed into ordinary net income.

This fair value approach and the point of revenue recognition, in particular, have been politically controversial and do not have the unanimous support of standard setters. For example, the Accounting Standard Setting Board of Japan has expressed concern about the direction of the project and requested that it be stopped (IAS Plus, 2004a). Moreover, given the likely impact on European reporting standards the European Financial Reporting Action Group (EFRAG) has been formed in order to make a pro-active contribution to the work of the IASB (EFRAG, 2004). EFRAG plans to be influential at an early stage by commenting on revenue recognition, which they believe has now become critical because of the approach taken by the IASB and Financial Accounting Standards Board (FASB) in linking revenue recognition to the definition of assets and liabilities (DRSC, 2004).[1] EFRAG has also echoed concerns of financial statement preparers about

[1] Given the controversy in Europe over the use of fair value measurement in IAS 39, it is not surprising that members of EFRAG have taken an active role in seeking to influence the development of revenue recognition concepts.

the lack of market prices, the obligation to provide reliable data and the duty of auditors to attest the data.

There is also considerable debate in academia regarding these issues. The first line revolves around the provision of information for informed decision making. For example, Johnson, Reither and Swieringa (1995) and Hirst and Hopkins (1998) argue that the inclusion of non-realized wealth changes in income increases the transparency, visibility and predictability of income and mitigates the different perceptions of financial analysts about stock values. This reasoning mirrors the arguments put forward by the Association for Investment Management and Research (AIMR) in a 1993 report that, in turn, was influential in starting the FASB comprehensive income reporting project in 1995 (Cahan et al. 2000). On the other hand, Paton (1934), Black (1993), Stark (1997) and others, argue the lumping together of comprehensive income components clouds the information content of the income figure because it contains transient, value irrelevant information not related to the 'true' long-run performance of a firm. The second line relates to the concept of capital maintenance, whereby, profit is only earned after beginning capital is maintained. Edwards and Bell (1961) assume a financial capital concept that incorporates holding gains into income and provides an income link to the balance sheet.[2] This concept is embodied in the residual income model (RIM) of Ohlson (1995) and Feltham and Ohlson (1995) and provides a formal link between prices, book value and clean surplus comprehensive income.[3] The financial capital concept has an ontological

[2] This model rejects the traditional net income model that is based on a narrow concept of realization whereby increments are not recognized as revenue unless realized in cash or near cash items.

[3] Feltham and Ohlson (1995) even suggest that any accounting principles are acceptable as long as the clean surplus relation holds. Recently, Ohlson (2003) modified this stance somewhat by proposing a primary problem of RIM is the elevated status it assigns to current and expected net book values and the need to juggle two accounting measures, the stock and flow. He argues that (i) only book values that match economic value result in perfect clean surplus measures, (ii) investment practice revolves around permanent earnings and their subsequent growth, not book values and their subsequent growth, and (iii) a model that relies on two value attributes runs at cross purposes (Ohlson, 2003, p.13, 20).

viewpoint that the marketplace is liquid, a proprietary view of the entity and thus a comprehensive view of income. The other major capital maintenance concept is operating or physical capital maintenance, whereby, income is only earned after net assets have maintained their ability to generate the same level of physical production or service output (Brief and Peasnell, 1996). This entity theory approach is more relevant for a production market environment, where capital is relatively immobile, and changes in fair value simply reflect increased input costs and, hence, adjustments to reserves for capital maintenance.

In a marketplace where accounting information is transparent and economic merit is comprehended and linearly transformed into prices, the joint issues of adequate information provision and measurement would be redundant. However, the standard setters in FASB and the ISAB believe a comprehensive income statement format provides the greatest transparency and information for decision making (FASB 1997 10, IAS 2004c). This stance is backed by the behavioural research of Maines and McDaniel (2000) and Hirst and Hopkins (1998), which shows that decisions of both non-professional investors and professional analysts are influenced by how and where comprehensive income components are reported. Hence, transparency and opaqueness in financial reporting does matter and, if there are behavioural differences, then regulators have to be careful how income is defined and where it is reported.

This paper examines whether the IASB's comprehensive income proposal with its individual components, improve the ability of firms to summarise financial performance, over and above that provided by net income. This is undertaken within an environment that allows substantial asset

revaluations and retains the reporting of extraordinary items, thus providing a working laboratory experiment of the IAS 2004c tentative decisions. Our tests examine the price return association over short and long window periods with non-linear regressions used to control for the possible effects of temporary income components.[4]

Overall results show that net income always dominates comprehensive income as a valuation metric, even after adjusting for the non-linear effects of temporary components. Further, extraordinary items are the only individual component that adds value. These results strongly support the previous empirical findings of Dhaliwal, Subamanyam and Trezevant (1999), O'Hanlon and Pope (1999) and Cahan et al. (2000). Furthermore, the study suggests that the IASB's decision to extend the recognition of income beyond traditional realization concepts, and not allow firms to signal capital maintenance increments, will not necessarily achieve the objectives of enhanced visibility and increased value relevance. Indeed, the proposed IASB comprehensive income performance report is a presentation format that possibly adds noise rather than information (per Black, 1993).

The next section provides a background overview of previous research. Section three outlines the empirical models, section four describes the data and outlines the statistical techniques, and section five reports the results. The paper is concluded in section six.

2. Background

Comprehensive income is net income plus other comprehensive income components. These other components may include such items as unrealized gains and losses on financial investments and non-

[4] See Walker (1997) and Ashton, Cooke and Tippett, (2003) who provide evidence that clean surplus income models, based on linear information dynamics (LID), do not adequately abstract the income related aspects of a

current assets, and changes in foreign currency translation reserves, pension reserves, extraordinary items, and other sundry reserve adjustment items. Not all items are equally important for a cross-section of firms. For example, for firms in the financial services industry, unrealized gains and losses on financial assets are the most important and volatile component (Bart et al. 1995). For production and industrial firms, increments and decrements in non-current assets and operating net income are more important (Easton, Eddy and Harris 1993, Barth and Clinch 1998). Accounting standard setters have accorded inconsistent treatment to the reporting of these components that, in turn, reflects the debate on these issue.

In June 1996, the FASB issued an exposure draft, *Reporting Comprehensive Income*, that proposed firms report income in a comprehensive performance statement under the assumption that such a statement would improve the visibility and, hence, the value relevance of reported income FASB 1996 50, 63). SFAS 130 was issued in June 1997 and after comments contained two significant changes to the exposure draft. Firms could report comprehensive income either as part of the income statement or as a statement of changes in equity; and the requirement to disclose earnings per share on a comprehensive basis was dropped.

The recent IASB decisions in IAS Plus (2004c) have a number of significant departures from SFAS 130. Comprehensive components will no longer be allowed to be reported in an equity statement with a single all-inclusive comprehensive performance statement replacing previous alternate presentations. Further, profit and revenue recognition will be more strongly linked to timely recognition and the fair value approach. For example, in the US unrealized gains and losses on

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firm's value.

available-for-sale marketable securities must be disclosed but not gains and losses on plant and equipment. Thus, remeasurements will comprise a larger proportion of comprehensive income. Similar to SFAS 130, the IASB comprehensive income statement proposes to enhance users' understanding of the entity's performance and assist predictions of future performance. An example given by the IASB of a comprehensive income statement is replicated in Appendix 1.

Whilst professional users such as AIMR supported the comprehensive income proposal[5] other commentators disagreed. For example, preparers expressed a concern that the reporting of all components of comprehensive income adversely effects the information content of the income figure. They argue that comprehensive income can be erroneously relied upon in entirety and even the separate reporting of dirty surplus items does not redress misconceptions. That is, users of reported accounting data are myopic and may take time to sift out accounting flows that may be highly transient and/or irrelevant for valuation purposes (Arthur Andersen 1962, Kiger and Williams 1977). A similar line of reasoning goes further by proposing that comprehensive income not only clouds the income statement but includes extraneous components that reduces the ability to uncover the long-run performance of the firm. Consequently, their exclusion would increase the price relevance and predictive ability of financial statements (Paton 1934, Black, 1993, Stark 1997, O'Hanlon and Pope 1999).

[5] Proponents of the comprehensive income concept argue that such income better measures firm performance because it includes all changes in the net assets of a firm during the reporting period. For example: "…an analyst's forecast can be used to value stock only if it is a forecast of comprehensive income, and a price/earnings ratio only has a precise interpretation if the earnings are comprehensive…" (American Accounting Association Financial Accounting Standards Committee, 1997, p.122).

An alternative solution to the mandated reporting of comprehensive income components would be to relegate dirty surplus flows and extraordinary items to the notes in the financial statements, but some argue this affects the timely value recognition of these items. To those who believe in stock market efficiency this is not a significant issue because investors would discover any value relevance in the notes and quickly impound that information in stock prices. To others, who believe the 'low visibility' of notes impairs the ability of the market to gather information, value relevance may be ignored or impounded at a slower rate than is desirable in fuller information market (Preinreich 1936, May 1937, Littleton 1940, Ohlson 1989). Hence, the low visibility argument suggests an important valuation role for the separate components of comprehensive income.

There are several empirical papers that throw light on this debate but generally support an 'irrelevance' conclusion for components. In the US, Amir, Harris, and Venuti (1993) found little evidence that accounting adjustments such as asset revaluations, goodwill, pension and tax adjustments to income, provide value relevance in terms of the income/return association but strong evidence for marketable security adjustments. In Australia, Barth and Clinch (1998) found varying results depending on asset class, firm size and accounting treatment, but overall found that financial asset adjustments had the strongest association with price increases. In the UK, O'Hanlon and Pope (1999) examined the value relevance of dirty surplus flows for cumulative periods of up to twenty years, and concluded that dirty surplus components are not utilised for valuation purposes and possibly add noise. Extraordinary items, however, were positively associated with price changes. The US paper by Dhaliwal, Subamanyam and Trezevant (1999) found: (i) comprehensive income was not more strongly associated with current prices than operating income, (ii) operating income was more strongly associated with future cash flows than comprehensive income, (iii) comprehensive

income components add noise to the income signal, and (iv) the usefulness of a mandated and uniform comprehensive income concept is questionable. Cohen et al. (2000) extended the research to New Zealand and suggest that whilst aggregated comprehensive income is more value relevant than net income, the separate components do not have incremental value relevance.

Psychology based research suggests that the various forms of income (non)reporting and presentation will aversely affect the decision making ability of analysts and nonprofessional investors and allows managers to opportunistically report income. If individuals perceive information to have a stamp of importance then they weigh this information more heavily in their decision making (Sanbonmatsu et al. 1997), analysts do not always carry out a detailed analysis of financial statements (Hirst, Koonce and Simko 1995), and footnote disclosures lead investors to rely on simple heuristics (Imhoff, Lipe and Wright 1995). In research specifically related to SFAS 130, Maines and McDaniel (2000), in an experimental setting, show that nonprofessional investors rely on comprehensive income more heavily and will not incorporate that information in their decisions if it is reported in other forms. Hirst and Hopkins (1998) find that the disclosure of comprehensive income can help analysts detect earnings management. According to Maines and McDaniel (2000) their results, in combination with those of Hirst and Hopkins (1998), show reporting of comprehensive income components in a performance statement improves both nonprofessional and professional judgements.

Maines and McDaniel (2000) suggest a 2 x 2 matrix of mediating variables whereby comprehensive income is delineated on core/noncore activities and investors delineated on a professional/nonprofessional basis. For financial analysts core business activity is critical for valuation

and analysts will search for core information regardless of where it is located. Because noncore activities are less important to a company's valuation it would be acquired and included only through accidental discovery in the search for more relevant information. On the other hand, nonprofessional investors will not distinguish between financial information that reports these two activities and the weight they attach to core and noncore information will depend on presentation format. In our experiment design we include Australian firms that undertake non-current asset revaluations under Australian Accounting Standards Board (AASB 1010) that have continued in the same industry for ten years. We argue asset revaluations on operating assets are not part of core operating activities. Consistent with past research we also test the value relevance of other comprehensive income components including extraordinary items. Essentially, our study provides a market test of the Maines and McDaniel (2000) hypothesis that the inclusion of noncore operations in comprehensive income, introduces extraneous noise for investors as a single class. Hence, we predict that by aggregating comprehensive components currently not allowed under FAS 130 and proposed under IAS 2000c reduces the information content of the income statement.

3. Empirical Models and Data

3.1 Comprehensive income and stock returns

Linear models

To empirically investigate the claim that income, measured on an aggregated comprehensive basis, is a more value relevant measure of firm performance than other summary income measures, we first utilize three linear return models (per Easton and Harris 1991, Dhaliwal, Subamanyam and Trezevant 1999):

$$RET_t = a_t + b_1 CI_{A_t} + b_2 \Delta CI_{A_t} + e_t \qquad (1a)$$

$$RET_t = a_t + b_1 NI_t + b_2 \Delta NI_t + e_t \quad (1b)$$

$$RET_t = a_t + CI_D + e_t = a_t + b_1 NI_t + b_2 \Delta NI_t + b_3 EI_t + b_4 FX_t + b_5 AREV_t + b_6 SUND_t + e_t \quad (1c)$$

where RET_t is the natural logarithm ratio of the Datastream annual return index for individual stocks, *CI* is comprehensive income before dividends, *NI* net income before dividends and extraordinary items, Δ denotes the first difference, and e is the regression residual. The separate components of comprehensive income (CI_D) consist of net income (*NI*), extraordinary items (*EI*), and changes in the balances of cumulative foreign currency translations (*FX*), revaluation reserves of non-current assets (*AREV*) and sundry items (*SUND*). All variables are deflated by the beginning-of-year stock price (P_{t-1}). Coefficients are estimated using pooled regressions over each of the *t*-period intervals based on the returns lagged seven days after the AMQ reporting date. Earnings response coefficients (ERCs) are reported as the sum of the level and change coefficients (b_1 and b_2) per Brown, Hagerman, Griffin and Zmijewski (1987).

Equation (1a) is derived from the large literature in accounting that implicitly follows Ohlson (1995) that is constructed on the idea that stock price is a function of both 'stock' and 'flow' values of a firm:

$$P_t = \int BVE_t + E_t + DIV_t \quad (2)$$

where P_t, the market price of any firm (say) *i* at time *t*, is some function of *BVE* as the 'stock' net book value of equity at time *t*, and the flow variables E_t (the earnings for year *t*) and *DIV* (dividends paid out in time *t*). A fundamental assumption is that earnings provide a clean surplus articulation between successive balance sheets ($BVE_{t-1,t}$) as follows:

$$BVE_t = E_t + N_t - DIV_t + BVE_{t-1} \quad (3)$$

where N is new capital issues. Clean surplus earnings can be further restated as:

$$E_t + DIV_t = CI_t = NI_t + OCI_t \qquad (4)$$

where OCI is other comprehensive income items. Equation (1a) is effectively the first difference of equation (2) after adding back dividends to BVE_t and making adjustments for new capital investment. Hence, CI_A is the sum of retained comprehensive income and dividends, which we refer to as a broad and aggregated measure of income. Net income (NI) in equation (1b), is net income before extraordinary items and dividends. We view this measure as representative of the traditional operating earnings concept which, in turn, means that the clean surplus relationship in (3) is not necessarily maintained. In summary, our measure of CI_A is consistent with the IAS income notion that income measurement incorporates both operating income and changes in the 'fair' value of capital from non-core sources, whilst NI is viewed as a measure of firm's operating performance. This allows us to compare the value relevance of income derived from two different concepts.[6] Finally, equation (1c) further allows us to analyse whether the decomposed components of comprehensive income (CI_D) individually have value relevance.

Non-linear models

The theoretical basis of a non-linear model is that stock price value relevance of income is correlated with income persistence, with permanent income having a high value relevance and transitory income a much lower value relevance (Freeman and Tse 1992). Hence, both the persistence of income and the related price response will decrease as the absolute magnitude of income increases because high levels of income contain a relatively higher proportion of temporary income components. A non-linear model thus serves a number of purposes. First, if CI has a high level of transitory items then a

non-linear model will filter out this impact and provide a more accurate representation of the value dynamics. This also provides an econometric methodological check for previous research that observed higher (or similar) linear regression coefficients for *NI* when compared to *CI*. Second, there are a number of reasons why *NI* may contain transitory items. Conservative or manipulative accounting techniques, changed operations or the inclusion of high variance recurring items previously extraordinary items may affect the functional relationship between prices and NI. Third, as a side issue, by extending the time frame and comparing we can also estimate how long it takes to establish linear information dynamics between earnings and prices. We apply the inverse tangent (arctan) regression model used by Freeman and Tse (1992) to estimate non-linear coefficients as follows:[7]

$$RET_t = a + b_1.arctan\,(b_2CI_t + b_3DCI_t) + e_t \quad (5a)$$

$$RET_t = a + b_1.arctan\,(b_2NI_t + b_3DNI_t) + e_t \quad (5b)$$

$$RET_t = a + b_1.arctan\,(b_2NI_t + b_3DNI_t) + b_3EI_t + b_4AREV_t + b_5FX_t + b_6SUND_t + e_t \quad (5c)$$

where all variables are defined as for equations 1a-c. Three pooled data sets were obtained using 1-year, 5-year and 10-year periods with the association tests run for all these periods using both linear and non-linear models. Earnings (income) response coefficients (ERCs) are reported as the sum of the level and change coefficients (b_1 and b_2) (per Brown, Hagerman, Griffin and Zmijewski 1987) with all variables deflated by the beginning-of-period stock price. Statistical significance between different models was compared using a Vuong (1989) test.[8]

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[6] See Accounting Research Bulletin (ARB) No. 35 issued by the Committee on Accounting Procedures in 1948; and FASB, Concepts Statements No's 5, 6 for a discussion on these issues.

[7] Model 5c is linear in the components. Alternate specifications were also estimated which included running the EI_t, REV_t, FX_t and $SUND_t$ terms (together with changes) using an arctan model. However, the linear levels model was parsimonious.

[8] The Vuong (1989) test is a log likelihood ratio test that provides a directional indication of which of the competing models better explains the data (see Vuong 1989 and Dechow 1994).

3.2 Data

Data consists of a sample of ninety two[9] Australian industrial firms listed on the Australian Stock Exchange (ASX) over the full data period from 1988 to 1997. Firm data was obtained from Datastream and checked against supplementary output from Connect 4, with a stock return index also collected from Datastream. Three pooled time period data sets were obtained from (i) the ten annual data observations for the ninety two firms augmented by the Australian Market Quote (AMQ) which records, to the nearest minute, the release of the annual report to the Australian stock exchange (ASX), (ii) aggregating two 5-year consecutive non-overlapping periods where the years 1988-1992 are aggregated to form the first interval and years 1993-1997 the second interval, and (iii) one 10-year data aggregation.

Table 1 below provides summary data on the number of *EI*, *AREV*, *FX* and *SUND* items that occur in our data set on a per year basis. In total, the number of these items declined over the sample period due largely to the decline in the reporting of *EI*. The number of asset revaluations declined to a lesser extent, FX transaction reporting increases over the period (possibly due to globalisation), with sundry items relatively stable. In Australia, in the absence of a requirement to produce a comprehensive income statement, a firm would simply report *FX*, *AREV*, and *SUND* as direct adjustments to equity (dirty surplus items). The reporting of *EI* as a separate item below *NI* in the income statement has changed over the test period. In 1990, the definition of *EI* changed from gains and losses outside the firm's ordinary operations by the addition of *'and are not of a recurring nature'*(ASRB 1018 para. 7). This meant that after 1990, *EI*'s previously reported as separate extraordinary items that recur to some extent, are now included as part of aggregated net income

although they may be non-core operating items. Table 1 shows that the impact of this change to the standard was to severely curtail the reporting of *EI*'s in Australia and raises the issue of whether income components should be separated or aggregated on grounds related to recurrence (permanence) or their relation to core-operations.

This issue has been taken a step further under the IAS Reporting Comprehensive Income Agenda project with a tentative decision to abolish the extraordinary category with these items now aggregated within a single profit figure (IASB Plus 2004c). Whilst, current international treatment of this item varies the trend is towards aggregation. Consistent with Australia, extraordinary items is permitted in the US but is restricted to infrequent, unusual and rare items. In the UK, FRS 3: Reporting Financial Performance (ASB 1992) effectively abolished the separate reporting of extraordinary items.

The argument for the separate reporting of extraordinary items is a legacy of the operating income approach that requires net income to reflect ordinary and continuous operating activities (Kiger and Williams, 1977). Further, by classifying and reporting extraordinary items as a separate below-the-line component explicitly recognizes the temporary nature resulting from these activities.[10] Previous research by O'Hanlon and Pope (1999) in the UK found that extraordinary items were the only value relevant dirty surplus component (in addition to ordinary income). Given the IASB intention to

[9] The original sample of 145 firms (industrial firms that Datastream had ten years of consecutive data for) was reduced to 92 after eliminating firms that did not have a full set of accounting variables available (32), and incomplete set of return data (19), and firms with inconsistent balance dates (2).

[10] Extraordinary items under Australian accounting standards are defined as "…items of revenue and expense which are attributable to transactions or events of a type that are outside the ordinary operations of the company or economic entity and are not of a recurring nature" (*Australian Accounting Standards Board (AASB) 1018, para. 9*).

abolish and fold this item into operating profit, and previous empirical evidence, we test whether extraordinary items have separate value relevance.

The revaluation of non-current assets in Australia is a primary source of dirty surplus accounting flows to equity reserves in financial statements (Barth and Clinch, 1998). AASB 1041: Revaluation of Non-Current Assets allows non-current assets to be valued on a fair value basis, where fair value is determined on a going concern basis[11] with revaluation increments posted directly to an asset revaluation reserve.[12] This treatment differs from the fair value recognition of financial assets, where increments or decrements are directly and immediately recognized in the income statement as revenue or expense. The IASB proposes to treat impairment of non-current assets as a remeasurement adjustment posted directly to operating profit, with revaluations accounted for in other business profit as part of the all inclusive statement of comprehensive income. In the US, the revaluation of non-current assets is not allowed, and in the UK they appear in a separate statement of recognized gains and losses. The IASB proposal that profit should not be based on a notion of realization and asset remeasurement increments should be directly accounted for as part of comprehensive income, would substantially change the reporting of income in Australia (and in numerous other countries). Hence, this provides us with a major motivation to test whether asset revaluation components have incremental value relevance.

[11] This effectively means, in the majority of cases, a non-current asset's fair value is measured by replacement cost (AASB 41 para. 5.1.9). The exceptions are specialized assets, or when the carrying amount is greater than the recoverable amount, when selling prices or discounted cash flow estimates can be used to value the asset (AASB 1010 para. 4.2, AASB 41 para. 5.1.8).

[12] Revaluation decrements that reverse an increment are also adjusted to reserves, impairment decrements are recognised as an expense and reversals of these are recognised as revenue.

The value relevance of other components tested are the movements in foreign translation reserves (AASB 1012) and sundry items that capture other transactions reported by the sample firms that bypass the income statement and are posted directly to reserves. A majority of these adjustments were prior period adjustments that result from mandatory changes in accounting policy (AASB 1018)

Our analysis bears similarities to the examination of decomposed comprehensive income components by Dhaliwal, Subamanyam and Trezevant (1999), but differs somewhat because they tested the major requirements of SFAS 130 whilst we test the major components that would be required under IASB (2004).[13] The major difference is the separate treatment of extraordinary items and the additional examination of asset revaluations.

< Insert Table 1 About Here >

4. Empirical results

4.1 Linear results

The results from estimating the pooled linear models (1a-c) for sub-periods from 1-year, 5-year and 10-years are reported in Table 2. Comparing results across the models and aggregation intervals, coefficients on NI and CI are positive and the explanatory power (R^2) increasing with the interval length. Hence, NI and CI are both value relevant for prices. However, the lower coefficients on CI combined with lower R^2 signify that CI is not as value relevant as NI. This preliminary result is

consistent with the proposition that CI concept diffuses the information content of income (Paton, 1934; Arthur Andersen, 1962; Stark, 1997).

Regression results for the disaggregated CI model (1c) reveal that within the individual components there is little additional explanatory power over and above operating income and the only coefficient that is significant is extraordinary items at the 1-year level.[14] This suggests that Australian dirty surplus flows do not incrementally impact upon stock prices. Further, the overall adjusted R^2 improves only marginally, indicating that operating earnings captures most of the explanatory power. These results are consistent with previous overseas research.[15]

< Insert Table 2 About Here >

Overall, the new insight obtained is in relation to CI. Note that the coefficients on CI are lower than the coefficients on NI (with lower R^2 statistics) and the components of NI add little information. This result signifies two interpretations. First, it confirms that the use of CI as a value prediction model is questionable, with the stock market treating the incremental CI flows, at best as irrelevant or, at

[13] Dhaliwal et al. (1999) examined net income after extraordinary items (*NI*), the change in the balance of unrealised gains and losses on marketable securities (*MKT-ADJ*), change in pension liability (*PENS-ADJ*), and change in foreign currency translation adjustment (*FC-ADJ*).

[14] To examine the impact of the change in accounting regulations in relation to extraordinary items referred to above, model 5c is reran including a dummy variable on *EI* to control for the change in accounting policy. The dummary variable was insignificant in the one year model and positive and significant at the five year model (at the 5% level) indicating a bias towards the pre-change period. To further examine this the data was split into pre and post sub samples and model 5c reran on both. This showed that *EI* is positive and significant in both periods, however only at the 10% level in the post change period (5% in the pre change period).

[15] Our results are consistent with previous research. In the U.K., O'Hanlon and Pope (1999) obtained R^2 ranging from 14% for the 1-year aggregation to 40% for the 10-year aggregation with ERC's of 2.09 in the 1-year interval and 1.7 for the long interval. O'Hanlon and Pope (1999) also found little evidence to support any value-relevance of disaggregated dirty surplus flows with the possible exception of extraordinary items. The US studies (Easton, Harris and Ohlson, 1992; Ohlson and Penman, 1992) report similar (but slightly lower) R^2 statistics, however, the short interval coefficients are less than 1 and the long-term approximately 1.7. The smaller response coefficients in the US were hypothesised to proxy for a higher level of transitory flows within US earnings, while O'Hanlon and Pope (1999) proposed that UK earnings contain greater permanent components.

worse, confusing and reducing the information content of income. Second, it simply provides evidence that CI has higher transitory flows than NI and needs to be appropriately adjusted by a non-linear model. If low response coefficients for CI are indeed proxying for high levels of transitory components in Australian firm's CI, then the use of non-linear regression techniques can be empirically justified. We undertake this analysis by directly adjusting for non-linearities for level and change regressions in the next section.

An unexpected observation from Table 2, given the contention of Barth and Clinch (1998) that asset revaluations are value relevant, is the insignificant coefficient on asset revaluations. During the study period the mean of asset revaluations was negative which reflects a period of declining asset prices after the high interest rate regime of the late 1980's and early 1990's. As a further test we reran the regressions by placing dummy coefficients on zero and positive revaluations. None of these dummy coefficients were significant.

We interpret this insignificant result as a fundamental question of the economic significance of asset price changes and what constitutes capital accretion and income recognition. Economically, movements in assets prices signify a changed opportunity cost of owning or buying an asset and the options open to a firm for the use of that asset. If the asset is an operating asset then price decreases (rises) denote that that asset has reduced (increased) demand for assets in that industry or the economy as a whole. Thus, reduced prices mean that the firm should retain an operating asset and obtain income through producing output. In other words, the risk of that asset has increased. On the other hand, if the firm wishes to retain and replace an operating asset after a price rise then the

income from the use of that asset must increase in order to justify the opportunity cost of retention and/or replacement. Hence, for operating assets the implication of asset price changes on firm value may actually mean an increase in risk or a more competitive operating environment. For financial assets in liquid markets the price relationship between accounting revaluation and prices should be much stronger, because of the higher liquidity of the asset market and the possibility of realisation. Hence, given a regime of falling asset prices, assuming mainly operating assets, and an expectation of reasonably permanent income from continued operations, asset revaluations should not have a significant price impact. A close examination of Barth and Clinch's (1998) return regressions show the R-squares on asset revaluations in the financial sector are much higher (58%) when compared to the non-financial (14%) and mining sectors (9%). Their results, in fact, are consistent with our theoretical arguments.

5.2 Non-Linear Results

Table 3 reports the results from the arctan regressions and Table 4 provides a comparison between linear and non-linear models for CI and NI. We determine three significant results. First, the evidence shows that the non-linear model has greater explanatory power in the short term. The non-linear adjustment to CI provides a superior model over the linear estimate for the 1-year period (Vuong statistic significant at 5%) with a higher IRC (1.133 *cf* with 0.470) and higher adjusted *R*-squared (0.07 *cf* 0.05). However, the non-linear adjustment to *NI* also provides a superior model over the linear model (Vuong test significant at 5%, higher ERC 1.927 *cf* with 1.310, higher adjusted R-squared 0.08 *cf* 0.12). Hence, whilst there is improvement in the predictive and explanatory power of CI, NI still remains the superior model. We conclude the non-linear model is more appropriate when modelling shorter-term associations (Freeman and Tse, 1992).

Second, the result for NI holds even though many of the transitory flows from the clean non-operating and dirty surplus items have been separated out (see Table 3, model 5c). Consequently there are still a substantial number of embedded transitory flows within the NI figure over the short-term. Indeed, none of the coefficients are significant for any of the CI components in panels C and D. In combination with the Vuong tests, these results show the superior value relevance of NI to stock returns and the greater importance of modelling transitory items within NI rather than accounting for CI components.

<Insert Table 3 About Here>

Third, our analysis provides an indication of the possible time frame needed before one could estimate a terminal value from expected income, or the time taken before linear dynamics are established. In the arctan model, departure from linearity is indicated by low b_1 coefficients, together with high b_2, b_3 coefficients. Note that the general pattern over time is increasing b_1 and decreasing b_2, b_3 coefficients. This indicates that the income/return relationship reverts towards a linear model over the long term and, hence, the impact of temporary income components is progressively washed out. But how long does this take? Vuong tests confirm that the non-linear model is a superior model over 1-year, but the linear model cannot be rejected in favour of the non-linear model over the longer aggregation horizons (5 and 10-years).[16] Furthermore, the linear CI model (5a) is rejected in favour of the non-linear equivalent in the one year intervals only. Vuong tests also confirm that the NI model (5b) is superior to the CI equivalent (5a) in both the one and five year intervals and in the one year interval when the non-linear models are compared. Finally, the disaggregated NI linear model shown

to out perform the NI model only at the 5% level (which can be attributed to *EI*), however once non-linearities are taken into account this dissipates. Hence, the Vuong tests confirm the dominance of the NI model over both the aggregated and disaggregated CI models in terms of explaining stock returns.

Observation of Table 4 also shows considerable improvement in explanatory and predictive power for NI over the 5-year period which suggests a forward planning horizon of at least 5-years. Clearly this factor will be determined by the competitive nature of the industry, the ability to sustain permanent earnings and the potential growth probability in earnings that is uncovered by further micro-analysis. However, using short term one and two year horizons without adjusting for temporary components is questionable.

< Insert Table 4 About Here >

5.3 Further Tests

In the above section we suggested a more micro-analysis of the data and in this section we undertake further tests related to size and leverage. Generally, Australian firms are smaller in size and are not as diversified when compared to US and UK firms and, therefore, we expect to observe a higher level of transient components or noise in the earnings stream (Ataise 1985). Freeman (1987) also determined that the change in stock prices due to earnings and other announcements is a decreasing function of size.[17] Chaney and Jeter (1991) found that income response coefficients (IRCs) were positively related to firm size and suggested that the different findings were related to their use of a

[16] The non-linear earnings model is shown to be superior to the linear model in the five year interval, however only at the 10% level.

[17] This is because of the larger amount of information in the market about large firms due to media attention, analysts following large firms more closely, supplements to annual reports, and greater investor followings, which, inturn, reduces the importance of earnings announcements because the market has already incorporated the information into stock prices.

longer event window (24 months). The longer time frame allows for a greater number of alternate sources of information about large firms to seep into prices, allowing investors to more accurately interpret the information in financial statements and predict future cash flows of firms with less uncertainty.[18] Hence, the effect of firm size is examined by segmenting the data into small and large firms using the median opening market capitalisation.

The impact of leverage is also examined by using the capital-gearing ratio as a proxy for firm leverage. Leverage is important for a number of reasons. First, it is a quasi measure for testing the information content of the balance sheet and is also a proxy for the financial risk of a firm (Kim, Chen, and Nance, 1992). Second, a highly levered firm is more likely to induce a greater degree of manipulation in the accounts in order to manage the firm's exposure to accounting based covenants and this introduces noise into the information content of the income stream (Watts and Zimmerman, 1986). Third, as leverage increases so does the volatility from the impact of news and this impacts upon the value of firm equity (Christie, 1982). For example, bad income news causes a drop in the value of stock equity, by further increasing leverage and making the residual equity riskier and increasing the required rate of return. Thus, there are two hypothesised effects. An income management effect that impacts the permanence of income (requiring a non-linear adjustment) and an information effect that should make any news in reported income more price sensitive (a higher IRC). The leverage impact is dichotomised in a similar manner as the firm size effect, with two samples created by ranking the t-period samples by leverage level, and then dividing these ranked samples at the median. All regression models were then rerun using both linear and arctan regressions over 1-year periods. The adjusted *R* squared and IRC results for these regressions are reported in Table 5.

[18] Therefore, earnings reports of large firms are less noisy.

< Insert Table 5 About Here>

Overall, the results of the size and leverage tests support our previous analysis. There is no evidence that the value relevance of CI is superior to NI over any decomposition of the data. Further, the disaggregated components of CI do not significantly add to the predictive power of any of the equations. Furthermore, the coefficients on the individual CI components (excluding NI) are not significant except for extraordinary items which was significant at 5-years for large firms.[19] We observe a firm size effect consistent with expectations. The income/returns association showed an inverse relationship between firm size and the value relevance of both accounting income measures.[20] There was also a significant leverage effect. In higher levered firms income is more highly correlated with returns than low levered firms. The 1-year non-linear regressions show an average R-squared of 7% for lower levered firms and 18% for higher levered firms with significantly higher IRCs (2.8 *cf* 1.9) after the non-linear adjustment.

Overall these results show that investors in high-risk firms (small firms, higher levered firms) rely more heavily on income information and require further information on the permanence of the income stream (non-linear adjustment). Finally, a consistent feature is the dominance of the NI non-linear model that significantly increases the explanatory power of the income/return coefficient and adjusted R-squares.

[19] Results are not Tabled but are available on request.

[20] There was superior coefficients and predictive power for small firms in all aggregation periods. For example, using the arctan specification for NI the adjusted R^2 was higher for small firms (21%, 49% and 53%) in comparison for large firms (4%, 12% and 23%) over the three aggregation periods respectively. This supports the notion of higher relevance of earnings for smaller firms associated with higher private search costs and less analyst attention to such firms.

5 Summary and Conclusions

This paper was motivated by the academic and professional interest induced by the research of Edwards and Bell (1961), Ohlson (1995) and Feltham and Ohlson (1995) that derived a residual income valuation model based on the concepts of clean surplus accounting and CI, and the focus of accounting standard boards on CI and its components. Recently, Ohlson (2003) questioned the valuation role of net book value but maintained CI as a valuation focus. In this paper we extend the Ohlson (2003) reassessment by empirically researching the comparative valuation roles of comprehensive income (CI) and operating income (NI).

Opponents of CI argue that component flows should be excluded from the income stream because they are non-operational, transitory in nature, mix capital and income concepts and, hence, do not fully reflect the performance of a company, especially in terms of a sustainable level of income. Supporters of CI accounting practices maintain that such flows allow for the inclusion of potentially value-relevant items from all sources of accounting and this provides a richer valuation information set.

We use data from ninety two Australian industrial companies over the period 1988 to 1987 to analyse the comparable valuation attributes of NI, CI and CI components in Australia. Our initial linear regression models indicates that the income/price coefficient on CI has lower explanatory and predictive power than NI, and the incremental comprehensive non-operating income and dirty surplus components of CI have minor information content. These results are broadly in line with previous studies in the UK and US (Amir, Harris, and Venuti, 1993; O'Hanlon and Pope, 1999). One potential cause of these results, however, is the higher degree of embedded transitory items that

are incorporated in CI. We then applied non-linear arctan regressions in order to control for the presence of transitory components.

Results showed that the value relevance of NI still dominated CI and we also found that the non-linear model out performed the valuation attributes of the linear model in the short-term, with convergence towards linear dynamics as the aggregation period increased. Further, results also suggested a window of at about five years is required before a stable terminal value can be estimated, although we acknowledge that this very much depends on micro factors such as industry and individual firm factors. Our results were robust to size and leverage factors with small firms and higher levered firms particularly dependent on income as a valuation metric and sensitive to the non-linear adjustment. It was concluded that knowledge of the non-linear functional relationship (sifting out permanent and temporary income components) between NI and price was more important than reporting CI components.

The major finding in this paper suggests that the use of CI as a general core valuation component is questionable, with the stock market treating incremental CI flows at best as irrelevant or, at worse, confusing because in aggregate it muddles the information content of reported income. In proposing a conceptual answer to these empirical results, we argue that CI includes a number of temporary income components that are combined with capital adjustments that cannot be realised in any pragmatic financial sense. The debate on whether to include capital components in income is not new, dating back to the 1960s when each proponent argued for their own general income concept. Edwards and Bell (1961) based their income model on a financial concept of capital and CI adopts this approach. However, this one-fits-all income approach does not recognise that different income

concepts may be industry or firm specific. For example, capital increments on operating assets are simply not part of income. They may even signify increased competition, inefficient use of resources, higher future replacement costs, or a higher opportunity cost that lies elsewhere rather than increased value added.

Contrary to Dhaliwal, Subamanyam and Trezevant (1999), who found that revaluations of financial assets provide significant information for prices, no evidence was found that supported the significance of asset revaluations. We argue that including all asset revaluations mixes capital and income components and introduces noise to the income figure. Overall, our results are stronger than Dhaliwal, Subamanyam and Trezevant (1999), which not only supports their argument that the imposition of comprehensive income is questionable across industries, but also across different countries and that have different asset structures. Further, as detailed in section five, we recommend that in order to improve the ability of comprehensive income to summarise firm performance, Accounting Standard Boards should concentrate on items that are closely related to the temporary and permanent components of operating income.

Finally, in reinforcing the superior general role of NI in firm valuation the research in this article provides several lessons. First, an understanding of the quality of the income stream through knowledge of the transitory and permanent components contained within, is central to valuation especially in the short-term. In this sense, the study illustrates the importance of applying more appropriate non-linear modeling techniques to improve the information content of accounting variables. Second, a micro approach that takes into account size, leverage and other firm characteristics such as the appropriate income determination model for that industry should enhance

the predictability of firms' income. Third, the research does not propose a rejection of the residual income model. The concept of a required economic rate of return on capital employed is central to any valuation theory model. The real issues are what is the capital employed in any period, what is the income earned and which component is permanent?

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Appendix 1: Example of Proposed IASB Comprehensive Income Statement

Illustration of the currently-proposed format *Version 5:7/05/2003*

	Total	Profit before remeasurements	Remeasurements
Revenue	1000	Revenue	-
Cost of sales	(400)	Materials, labour etc	Inventory impairments
Selling, general, admin	(250)	Depreciation/amortisation	PPE/intangible impairment
		Rental/other income	
		Provision, initial recognition	Provision, remeasurement
		Service cost	Pension actuarial loss (cash flow assumptions)
Operating Profit	**350**		
Disposal gain/loss	100	-	Disposal gain/loss
PPE revaluation	150	-	PPE revaluation
Investment property	-	-	Investment property fair value change
Goodwill	(100)	Negative goodwill	Goodwill impairment
FX gain/loss on net investment	(50)	-	FX gain/loss on net investment
Other Business Profit	**100**		
Income from associates	50	Income from associates	-
Write-down of accounts receivable	(10)	-	Write-down of accounts receivable
Equity investments	(60)	-	Equity investment return
Debt investments	20	Interest income	Fair value change on debt investments
Pension assets	(150)	-	Return on pension assets
Financial Income	**(150)**		
Business Profit	**300**		
Interest on liabilities	(80)	Interest expenses	Change in provision discount rate
Pension financing expenses	(120)	Unwinding of discount rate	Change in pension obligation discount rate
Financing expense	**(200)**		
Tax	(30)	-	-
Discontinuing activities	(10)	Net discontinuing	Net discontinuing
Cash flow hedges	50	-	Fair value changes in cash flow hedging instruments
Profit	**110**		

Source: http://www.iasplus.com/agenda/performat.htm

Table 1
Descriptive Statistics - Other Comprehensive Income Components

Type	Sign	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
All	+	101	98	65	55	65	55	40	69	34	76
	-	92	84	56	58	60	53	63	38	73	28
	Total	193	182	121	113	125	108	103	107	107	104
EI	+	36	26	13	7	1	4	1	4	3	0
	-	34	36	15	15	6	4	4	2	3	4
	Total	70	62	28	22	7	8	5	6	6	4
AREV	+	25	23	17	13	7	9	10	9	8	11
	-	22	19	16	22	35	24	19	22	20	11
	Total	47	42	33	35	42	33	29	31	28	22
FX	+	12	18	13	23	31	32	8	40	7	41
	-	26	22	20	13	14	16	35	8	45	10
	Total	38	40	33	36	45	48	43	48	52	51
SUND	+	28	31	22	12	26	10	21	16	16	24
	-	10	7	5	8	5	9	5	6	5	3
	Total	38	38	27	20	31	19	26	22	21	27

Note: Figures represent the number of firms with OCI components on a year by year basis.

Table 2
The Value Relevance of Comprehensive Income and Components – Linear Analysis

Model	Period	a	CI	DCI	NI	DNI	ERC	EI	AREV	FX	SUND	Adj. R^2	Vuong Test
1a	1	0.057**	0.323***	0.147***			0.460					.05	
1b	1	0.045			0.953***	0.357***	1.310					.08	73.045**
1c	1	0.051**			0.943***	0.399***	1.342	0.350**	-0.178	-1.046	-0.048	.08	49.522*
1a	5	0.129*	0.205***	0.174*			0.379					.19	
1b	5	0.129			0.649***	0.325**	0.974					.29	33.876**
1c	5	0.131*			0.663***	0.311**	0.974	0.246	-0.007	0.146	-0.003	.29	5.124
1a	10	0.565**	0.243***	1.059***			1.312					.25	
1b	10	0.473			1.011***	1.400**	2.411					.34	7.020
1c	10	0.486**			1.043***	1.438**	2.481	0.388	-0.071	1.802	-0.062	.31	3.133

The summary results presented in this table are the pooled regression results for equations:

$RET_t = a + b_1CI_t + b_2DCI_t + e_t$ (1a)

$RET_t = a + b_1NI_t + b_2DNI_t + e_t$ (1b)

$RET_t = a + b_1NI_t + + b_2DNI_t + b_3EI_t + b_4AREV_t + b_5FX_t + b_6SUND_t + e_t$ (1c)

where RET_{it} is the t-period stock return, CI_t is comprehensive income defined as the aggregation of NI_t, EI_t, $AREV_t$, FX_t and $SUND_t$, NI_t is ordinary net income, EI_t is extraordinary items, $AREV_t$ is change in asset revaluation reserve, FX_t is foreign currency translations and $SUND_t$ refers to sundry items that balance the clean surplus articulation. All variables are scaled by beginning of period market value and cumulated over consecutive (non-overlapping) t-period intervals. * represents statistical significance at the 10% level, ** represents statistical significance at the 5% level, and *** represents statistical significance at the 1% level. ERC is the aggregated level and change income coefficients. The Vuong (1989) test is a log likelihood ratio test that provides a directional indication of which of the competing models better explains the data. A significant positive Vuong statistic indicates that CI is rejected in favour of NI (see Vuong 1989, Dechow 1994).

Table 3
The Value Relevance of Comprehensive Income and Components – Non-Linear (Arctan) Analysis

Model	Period	a	b_1	b_2	b_3	CI	NI	EI	AREV	FX	SUND	Adj. R^2	Vuong
5a	1	0.055**	0.345**	2.226*	1.057*	1.133						.07	
5b	1	0.057**	0.533***	0.929***	2.687**		1.927					.12	82.386**
5c	1	0.057**	0.565***	0.804***	2.448***		1.837	-0.066	0.159	-0.685	0.011	.12	27.336
5a	5	0.093	0.604**	1.411*	0.243	0.999						.20	
5b	5	0.097*	1.087***	1.206**	0.609*		1.973					.33	21.543
5c	5	0.097	1.128***	1.227**	0.587*		2.046	0.308	-0.188	-0.267	-0.005	.34	12.227
5a	10	0.543**	1.001**	0.778*	0.778*	1.245						.26	
5b	10	0.509**	1.767**	0.761*	0.818		2.790					.33	-2.348
5c	10	0.515*	2.481*	0.476	0.543		2.528	0.080	-0.007	0.720	-0.165	.36	10.939

The summary results presented in this table are the pooled regression results for equations:

$RET_t = a + b_1*arctan\ (b_2*CI_t + b_3*DCI_t) + e_t$ (5a)

$RET_t = a + b_1*arctan\ (b_2*NI_t + b_3*DNI_t) + e_{it}$ (5b)

$RET_t = a + b_1*arctan\ (b_2*NI_t + b_3*DNI_t) + b_4*EI_t + b_5*AREV_t + b_6*FX_t + b_7*SUND_t + e_t$ (5c)

where RET_t is the *t*-period stock return, CI_t is comprehensive income defined as the aggregation of NI_t, EI_t, $AREV_t$, FX_t and $SUND_t$, NI_t is ordinary profit, EI_t is extraordinary items, $AREV_t$ is asset revaluations, FX_t is foreign currency translations and $SUND_t$ refers to sundry items that balance the clean surplus articulation. All variables are scaled by market value and cumulated over consecutive (non-overlapping) *t*-period intervals. The coefficients are reported with the corresponding *t*-values in the brackets below. The ERC on CI_t and NI_t are calculated as $b_1(b_2+b_3)$. * signifies statistically significant at the 10% level, ** signifies statistically significant at the 5% level, and *** signifies statistically significant at the 1% level. The comprehensive income *CNI* and *DS* components were also re-estimated with arctan functions around each component with no significant results or improvements observed. A significant positive Vuong statistic indicates that CI is rejected in favour of NI.

Table 4
Comparison of Comprehensive and Net Income

Panel A: Linear Model

	Comprehensive Income		*Net Income*		
Period	**ERC**	**AdjR^2**	**ERC**	**AdjR^2**	**Vuong Test**
1	0.470	.05	1.310	.08	73.045**
5	0.379	.19	0.974	.29	33.876**
10	1.302	.24	2.411	.34	7.020

Panel B: Non-linear Model

	Comprehensive Income		*Net Income*		
Period	**ERC**	**AdjR^2**	**ERC**	**AdjR^2**	**Vuong Test**
1	1.133	.07	1.927	.12	82.386**
5	0.999	.20	1.973	.33	21.543
10	5.441	.26	2.790	.33	-2.348

Panel C: Vuong Test Linear v's Non-linear

	T =1	**T = 5**	**T = 10**
1a v 5a	80.624**	2.906	1.503
1b v 5b	67.058**	24.727*	-7.087

This table presents aggregated coefficients, R^2 statistics and Vuong tests for regression models:

$RET_t = a + b_1CI_t + b_2DCI_t + e_t$ (1a)

$RET_t = a + b_1NI_t + b_2DNI_t + e_t$ (1b)

$RET_t = a + b_1*arctan\ (b_2*CI_t + b_3*DCI) + e_t$ (5a)

$RET_t = a + b_1*arctan\ (b_2*NI_t + b_3*DNI) + e_t$ (5b)

* denotes statistical significance at the 10% level, ** at the 5% level, and *** at the 1% level. A significant positive Vuong statistic indicates that CI is rejected in favour of NI, or the linear model is rejected in favour of the non-linear model.

Table 5
Small Firm Size and High Leverage Firms - Linear and Non-Linear Pooled 1-Year Models

	CI		NI		Disaggregated CI	
	ERC	**Adj R^2**	**ERC**	**Adj R^2**	**ERC**	**Adj R^2**
Full Sample						
Linear	0.470	0.05	1.310	0.08	1.299	0.08
Non-Linear	1.133	0.07	1.927	0.12	1.917	0.12
Small Firm Size						
Linear	0.128	0.06	1.390	0.14	1.395	0.14
Non-Linear	1.017	0.15	2.446	0.21	2.596	0.22
High Leverage						
Linear	0.369	0.08	1.894	0.16	1.932	0.16
Non-Linear	1.535	0.09	2.814	0.18	2.838	0.18

This table presents aggregated ERC's and summary R^2 statistics for 1-year regression models estimated from the following:

$$RET_t = \alpha + b_1 CI_t + b_2 \Delta CI_t + e_t \quad (1a)$$

$$RET_t = \alpha + b_1 NI_t + b_2 \Delta NI_t + e_t \quad (1b)$$

$$RET_t = \alpha + b_1 NI_t + + b_2 \Delta NI_t + b_3 EI_t + b_4 AREV_t + b_5 FX_t + b_6 SUND_t + e_t \quad (1c)$$

$$RET_t = \alpha + b_1 * \arctan (b_2 * CI_t + b_3 * \Delta CI) + e_t \quad (5a)$$

$$RET_t = \alpha + b_1 * \arctan (b_2 * NI_t + b_3 * \Delta NI) + e_t \quad (5b)$$

$$RET_t = \alpha + b_1 * \arctan (b_2 * NI_t + b_3 * \Delta NI) + c * EI_t + d * AREV_t + e * FX_t + f * SUND_t + e_t \quad (5c)$$

The full sample results are shown for comparative purposes. Small firms are those below the beginning of year median market capitalisation and high leverage firms are those above beginning of year median capital gearing.