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Usefulness of comprehensive income reporting in Canada

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ABSTRACT

In January 2005 the Canadian Accounting Standards Board (AcSB) issued three new accounting standards that require Canadian firms to mark-to-market certain financial assets and liabilities and recognize the holding gains and losses related to these items as other comprehensive income or as part of net income. The Board's objectives for issuing the new standards are (i) to harmonize Canadian GAAP with US and International GAAP, (ii) to enhance the transparency and usefulness of financial statements, and (iii) to keep pace with changes in accounting standards in other countries that are moving towards fair value accounting. This paper investigates empirically whether requiring Canadian companies to report comprehensive income and its components provides the securities market with incremental value-relevant information over the traditional historical-cost earnings approach.

Previous empirical studies provide mixed evidence on the value relevance of other comprehensive income and its components. This mixed evidence may be attributed partially to the use of *as if* methodology to construct an ex-ante measure of other comprehensive income prior to the implementation of SFAS 130, which introduces measurement error. In contrast, this study uses actual data on other comprehensive income for a sample of Canadian firms cross-listed in the US in the period 1998–2003. We find evidence that available-for-sale and cash flow hedges components are significantly associated with price and market returns. We also find that aggregate comprehensive income is more strongly associated (in terms of explanatory power) with both stock price and returns compared to net income. However, we find that net income is a

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better predictor of future net income relative to comprehensive income. Our findings suggest that mandating all Canadian firms to adopt the new accounting standards is expected to enhance the usefulness of financial statements. Our findings, therefore, should be of interest to Canadian accounting policy makers as they provide ex-ante evidence on the potential usefulness of mandating firms to report comprehensive income and the components of other comprehensive income in their financial statements.

1. Introduction

Recently, Canadian accounting standard setters, like many other national and international accounting bodies, have taken steps to encourage the reporting of a more all-inclusive (clean surplus) comprehensive income and the adoption of fair value measures in corporate financial statements.[3] On January 27, 2005 the Canadian Accounting Standards Board (AcSB) issued three related accounting standards to address the recognition, measurement, and disclosure of financial instruments and comprehensive income: (i) Handbook Section 1530, *Comprehensive Income*,[4] (ii) Handbook Section 3855, *Financial Instruments – Recognition and Measurement*; and (iii) Handbook Section 3865, *Hedges*.[5] These new standards require Canadian companies to measure certain financial assets and liabilities at fair market value and recognize the changes in their fair market value (i.e., unrealized holding gains and losses) temporarily outside the net income as other comprehensive income until they are transferred to net income.[6,7]

The Board's rationale for issuing these new standards is partially driven by the need to enhance the transparency of financial statements and to provide capital markets with more relevant accounting information relative to net income alone. The Board is also motivated by the need to harmonize Canadian GAAP with corresponding standards issued by the US Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB).[8]

The objective of this paper is to examine whether the provision of summary comprehensive income and the components of other comprehensive income in firms' financial statements have value relevance over reporting traditional net income alone. We use a sample of cross-listed Canadian firms (listed in the US) in the period of 1998–2003, which have implemented similar rules under the US GAAP. This sample of firms, therefore, provides a unique setting in which to inform Canadian policy makers of the value relevance of the additional information included in the new accounting standards.

Previous empirical studies in other countries document mixed evidence on the usefulness of other comprehensive income information to investors. For example, Dhaliwal et al. (1999) report that sum-

[3] Examples include: Accounting Standards Board of the UK (FRS 3 issued in 1992), New Zealand (FRS 2 issued in 1994), the Financial Accounting Standards Board of the US (SFAS 130 issued in 1997), and the International Accounting Standards Committee (IAS 1 issued in 1997).

[4] Section 1530 defines comprehensive income as a change in the value of net assets that is not due to owner activities (investments or distributions). Holding gains and losses on financial assets classified as available- for-sale investments and foreign currency translation gains and losses on self-sustaining foreign operations are examples of items that would be included in other comprehensive income.

[5] The application of hedge accounting is optional. The new standard replaces the hedge accounting requirements in Section 1650 and provides firms with specific guidance on minimum disclosure standards and encourages firms to voluntarily adopt it to reflect fairly the effects of certain financial risk management strategies in net income. In addition, it allows Canadian firms to comply with SFAS 133, and IAS 39.

[6] The mandatory effective date is for annual and interim periods in fiscal years beginning on or after October 1, 2006. However, early adoption is permitted. The earliest voluntary adoption would be for the fiscal year ending December 31, 2004.

[7] Unrealized gains and losses on trading securities and fair value hedges are recognized in the income statement, while they are recognized as components of other comprehensive income for available-for-sale securities and cash flow hedges.

[8] The AcSB points out that new standards have been developed based on existing similar US and international accounting pronouncements, taking into account the latest in improvements that have been made to those pronouncements. For example, Section 3865 is based on both Statement of Financial Accounting Standards, SFAS 133, *Accounting for Derivative Instruments and Hedging Activities,* and International Financial Reporting Standards, as set out in International Accounting Standard IAS 39, *Financial Instruments – Recognition and Measurement*.

mary comprehensive income disclosure required by SFAS 130 is neither more strongly associated with market returns nor a better predictor of future cash flows/income than current net income. On the other hand, Biddle and Choi (2006) find some evidence confirming that the disclosure of components of other comprehensive income is useful. O'Hanlon and Pope (1999) find "little evidence that other flows excluded from ordinary profit are value-relevant" for UK firms and Cahan et al. (2000) "find no evidence that [comprehensive income] items provide information that is incrementally relevant above net income" for New Zealand firms. These conflicting results can be attributed partially to the use of the *as if* estimation technique to construct an ex-ante measure of other comprehensive income prior to the implementation of SFAS 130, which introduces measurement error (Chambers et al., 2007).

Although our study builds upon the study by Dhaliwal et al. (1999), it differs in three important ways. First, we examine the association between market returns using the *actual* (rather than *as if* estimates) components of other comprehensive income in the *post-adoption* periods of SFAS 130 for a sample of Canadian firms cross-listed in the US. This should enable us to draw more accurate conclusions about the usefulness of other comprehensive income items providing important evidence for policy makers. Second, we include the change in fair value of cash flow hedges, an important component of other comprehensive income. None of the other studies (for example Dhaliwal et al. (1999), Biddle and Choi (2006) and Chambers et al. (2007)) have used change in fair value of cash flow hedges in their analyses. Third, we include both market returns and price models for both summary and components of comprehensive income.[9] Inclusion of both price and returns models potentially provides more convincing evidence of the value relevance of these items (Kothari and Zimmerman, 1995).

Our empirical analyses provide evidence that the change in the fair value of the available-for-sale investments component of other comprehensive income is positively associated with market returns and stock price. We also document a negative association between the change in fair value of cash flow hedges component and market returns and stock price under some model specifications. To further investigate the negative sign on the change in fair value of cash flow hedges, we incorporate an interaction variable that separates winning and losing hedging positions. As discussed by Venkatachalam (1996), even negative values of the change in the fair value of cash flow hedges may provide risk-relevant information that could be positively associated with returns.

A plausible explanation for the losing positions to be viewed as a positive signal is that hedging activities may indicate that firms are proactively managing their risk even when they result in losses. Our results provide weak support for the signalling argument. That is, under most specifications, the market seems to react to a losing hedge position as a signal of risk management. Although, the winning position is incrementally positively priced, it does not have an overall positive association. We also find that aggregate comprehensive income is more strongly associated (in terms of explanatory power) with both stock price and returns compared to net income. However, we find that net income is a better predictor of future net income relative to comprehensive income. We infer from these results that the components of other comprehensive income are value-relevant, but are poor predictors of future profitability due to their transitory nature. Therefore, our results support the introduction of a separate comprehensive income statement to keep the predictive value of the income statement intact.

Our contribution to the literature is threefold. First, by using a sample of cross-listed Canadian firms in the period of 1998–2003, which already report other comprehensive items in accordance with SFAS 130, we are able to provide Canadian policy makers with ex ante evidence on the usefulness of disclosing other comprehensive income and its components.[10] Second, inferences drawn from the results obtained from the period after the adoption of SFAS 130 are more appropriate for assessing whether

[9] Although, Dhaliwal et al. (1999) report results for a price model in their Table 5, they only use this model to examine the effect of summary comprehensive income and do not analyze the association between price and the components of other comprehensive income.

[10] Before the new standards were implemented in 2006, only aggregate information on the fair value of financial assets and financial liabilities was provided in the notes to the financial statements. Furthermore, hedge accounting was not available. Distinctions were not made among the three categories of investments (trading securities, available-for-sale and held to maturity) or possible hedging strategies (fair value hedges and cash flow hedges).

the capital market better understands the value implications of components of other comprehensive income, and hence may help to explain the mixed results documented in previous studies. Finally, the findings of this study support the approach adopted by standard setters to introduce changes in fair value in the statement of other comprehensive income, and not in the income statement, since they are value-relevant but have low predictive power over net income. As a result, the relevance of the income statement (predictive and feedback values) is preserved.[11]

The rest of this paper is organized as follows. Section 2 presents the background and discusses the prior literature. Section 3 describes the sample selection, data and research design. Section 4 presents the empirical analysis and Section 5 concludes the paper.

2. Background and prior research

Measuring periodic performance and financial position of a business entity has always been a challenge for accounting policy makers and a major concern for users of accounting information. The major challenge is how to capture the underlying economic value of a firm that operates in a continuously changing and highly sophisticated global business environment. Three interrelated fundamental issues are at the heart of this debate: (i) how to *measure* the assets and liabilities of a business entity (historical-cost vs. fair market value), (ii) how to assess the value added to the wealth of the owners during the period (current operating performance vs. all-inclusive income)[12], and (iii) where to *disclose* the recognized changes in the wealth of the owner (i.e., clean surplus vs. dirty surplus accounting).[13]

One view is that net income should measure all changes in the economic value of a business entity resulting from all activities and circumstances, except those arising from investments by and distributions to owners. This concept of all-inclusive (clean surplus) comprehensive income requires that the value changes in all assets and liabilities of a firm should flow through the income statement and be measured at their market values. Proponents of this approach argue that the financial statements prepared under these conditions should reveal, to a greater extent, the true underlying earnings strength of the firm, provide investors and creditors with clear insights into the future prospects of the firm and improve the predictive ability of its future earnings and cash flows. Therefore, investors should be able to estimate more accurately the value of a firm. Accounting-based valuations models (Ohlson, 1995; Feltham and Ohlson, 1995) rely on the clean surplus flows to derive the relationship between the basic dividend discount model and earnings. This further lends support to the all-inclusive earnings concept.

Alternatively, proponents of the current operating income approach argue that net income should reflect the permanent earnings strength of a firm that results only from recurring core-business activities as measured objectively by historical-cost and according to the realization concept. Changes in the value of the firm that are transitory in nature and arise from non-core-business activities have limited predictive power; therefore they should bypass the income statement and be reported in the owners' equity section on the balance sheet. The main thrust of this approach is that allowing these so called "dirty surplus" items to flow through the income statement increases the volatility of reported earnings, and hence reduces its predictive power. However, it can be argued that allowing significant changes in the value of the firm to bypass the income statement and be reported directly in owners' equity reduces the quality of earnings and impairs its role as a significant input for contracting and valuation. In turn, this may encourage management to opportunistically manage earnings, and causes

[11] Components of other comprehensive income may differ in their value relevance for the following reasons. First, holding gains and losses recognized in the income statement (marketable securities and fair value hedges) are more short term in nature than those recognized (available-for-sale securities and cash flow hedges) as other comprehensive income. Second, among those recognized in other comprehensive income, some holding gains and losses are related to investment decisions, while others are related to hedging strategies. For this reason, one may expect to see different value relevance for different components. Therefore, results such as ours, provide some insight to standard setters on the usefulness of fair value accounting.

[12] Current operating performance recognizes the change in value resulting from core business activities, while all inclusive income recognizes all changes in the values of assets and liabilities, including holding gains and losses.

[13] In other words, whether all changes should flow through the income statement or some items should bypass the income statement and be reported directly in the equity section of the balance sheet.

misleading inferences to be drawn by the users of accounting information (Watts and Zimmerman, 1986; AIMR, 1993; Beaver, 1998; O'Hanlon and Pope, 1999; Scott, 2006).

Current GAAP practices in nearly all countries adopt a mixed approach, where firms are required, at the minimum, to report results of the primary operating activities on the basis of historical-cost approach and the realization principle. Requirements for reporting results of peripheral activities including holding gains and losses resulting from changes in fair value of certain assets and liabilities, however, vary significantly from country to country. In recent years, the accounting profession and the users of accounting information have raised serious concerns that such inconsistency and disparity of accounting standards will reduce the transparency of financial statements, weaken their comparability, and impair the value relevance of accounting information to investors, creditors and other users. For example, AIMR (1993) argues that requiring companies to disclose similar items differently may create an artificial distinction between these items, which could result in users of financial statements perceiving them as different items.

In response to these criticisms and to the growing need to enhance transparency and the value relevance of financial statements, accounting policy makers in many countries have taken steps to adopt the all-inclusive (clean surplus) accounting approach. These accounting standards require companies to report more comprehensive income items and/or use fair value measures in preparing corporate financial statements. Examples include: Accounting Standards Board of the UK (FRS 3 issued in 1992), New Zealand (FRS 2 issued in 1994), the Financial Accounting Standards Board of the US (SFAS 130 issued in 1997), and the International Accounting Standards Committee (IAS 1 issued in 1997).

Prior to 2006, Canadian GAAP did not have accounting standards that regulated the recognition and measurement of financial instruments at fair value, or the disclosure of other comprehensive income and its components. To keep pace with the changes in accounting standards in the rest of world, the Canadian AcSB issued three new accounting standards that required firms to report certain financial instruments at fair value and recognize the changes in their value as holding gains or losses temporarily in other comprehensive income until disposition (available-for-sale investments) or until recognition of the hedged item in the income statement (cash flow hedge), which would then be recognized in net income. A primary reason for issuing the new standards was to improve the value relevance and transparency of financial statements.

However, previous empirical studies on usefulness of comprehensive income provide mixed results. Dhaliwal et al. (1999) find no evidence that comprehensive income is more strongly associated with returns/market value or better predicts future cash flows/income than net income. Moreover, the only component of comprehensive income that improves the association between income and returns is the available-for-sale securities adjustment for financial firms. Their results do not support the claim that other comprehensive income is a better measure of firm performance than net income. Dhaliwal et al. (1999) focus on summary comprehensive income and do not directly examine the usefulness of individual components of other comprehensive income. Instead, they examine whether the addition of individual components of other comprehensive income to net income improves the association between income and stock returns.

Also using *as if* numbers, Biddle and Choi (2006) find evidence confirming that broader definitions of income are more decision-useful in *investing applications* and that the disclosure of comprehensive income components is useful, whereas narrower definitions of income are useful in *contracting applications*. In a contemporaneous study, Chambers et al. (2007) also use post-SFAS 130 numbers.[14] Interestingly, their results are weaker than the results reported in our paper. Furthermore, our main focus is whether components of other comprehensive income are value-relevant using both price and returns model. In particular, our focus is on the capital market valuation of the change in the balance of unrealized holding gains and losses on available-for-sale securities, the change in the fair value of cash flow hedges, and the change in cumulative foreign currency translation adjustment. These three items are included as the components of other comprehensive income in the Canadian Standards. Chambers et al. (2007) focus on presentation format of other comprehensive income and the value relevance of the three

[14] Chambers et al. (2007) acknowledge that their study is a contemporaneous study that looks at the post-SFAS 130 adoption period.

items that are readily available in Compustat: the change in the balance of unrealized holding gains and losses on available-for-sale securities, the change in the fair value of pension adjustments, and the change in cumulative foreign currency translation adjustment.

International evidence on the usefulness of other comprehensive income is also mixed. O'Hanlon and Pope (1999) find "little evidence that other flows excluded from ordinary profit are value-relevant" for UK firms. Using sample firms from New Zealand, Cahan et al. (2000) find that while the aggregate amount of comprehensive income has information value, individual components do not. O'Hanlon and Pope (1999) examine the association between returns and individual dirty surplus items, whereas Cahan et al. (2000) use a price model.

Hirst and Hopkins (1998) and Maines and McDaniel (2000) examine the usefulness of SFAS 130 in laboratory settings. Hirst and Hopkins (1998) find that disclosure of the SFAS 130 marketable securities component helps buy-side equity analysts estimate more accurately the stock price of a company that upwardly manages its net income using the available-for-sale investment portfolio. A follow up study of bank analysts' risk and value judgments reaches a similar conclusion (Hirst et al., 2004). As Hirst and Hopkins (1998) correctly state (p. 48), "[a] strict interpretation of the efficient markets hypothesis suggests that SFAS 130 constitutes a simple *reformatting* of the financial statements (i.e., there are no new recognition or measurement rules included in SFAS 130), [that] will have no effect on financial statement users' judgments" (emphasis in the original). Nevertheless, they argue from a behavioural perspective that "analysts" judgments will be affected by the clarity of disclosure of value-relevant information.

Based on the above discussion, it is difficult to draw clear expectations of whether requiring firms to report components of other comprehensive income is likely to increase or decrease the value relevance of the accounting information. Therefore, the net effect depends on the relative importance of these potentially competing forces. Considering that accounting standard setters around the world are moving towards more fair value measurements, additional evidence on the value relevance of components of other comprehensive income is useful.

3. Data selection and research design

3.1. Data

Our sample consists of Canadian firms that are listed on the Toronto Stock Exchange as part of the TSE300 index, and are also traded on the New York Stock Exchange (NYSE), or the American Stock Exchange (ASE), or the National Association of Security Dealers and Quotation (NASDAQ). Since SFAS 133 came into effect in the US in 1998, the sample covers the period from 1998 to 2003. To be included in the sample, a firm must be covered by *CRSP* or *BLOOMBERG* and its annual report must be available on the *SEDAR* website.[15] We collected data on stock returns, market value of equity and common shares outstanding from *CRSP* or *BLOOMBERG* and all other accounting data from the annual reports.

The initial sample comprised 357 firm-year observations. Given that some of our tests use lagged variables, we lose an additional year of data, which reduces the sample to 282 firm-year observations. An additional 53 firm-year observations are lost due to missing data or because all three components of other comprehensive income are zero. Finally, one firm-year observation with abnormal influence is omitted.[16] The final sample consists of 228 firm-year observations from 75 firms for the market value and stock returns tests. However, considering that most firms are non-financial firms, we only present the results for those firms (203 firm-year observations).[17]

Firms that are cross-listed (in Canada and in the US) are required to reconcile the difference between Canadian and US GAAP in the notes to their financial statements. Given that US GAAP has re-

[15] SEDAR is the website where all public information released to the Ontario Securities Commission is made publicly available (http://www.sedar.com).

[16] One observation with a *R*-Student measure exceeding 3 (in absolute value terms) was eliminated due to its abnormal influence on the regressions.

[17] We also estimate all our tests using the full sample (including financial firms) of 228 firm-year observations for 75 firms. The results of this estimation are similar to those reported in the paper.

quired firms to recognize holding gains and losses on cash flow hedges since 1998, we are able to obtain all the information on fair value disclosures from the notes to the financial statements. Therefore, the use of a sample of cross-listed firms allows us to test the new standard prior to its implementation. All other accounting information was obtained from the body of the annual reports.

3.2. Research design

We first investigate the association between price and the change in the components of other comprehensive income. Although, under Canadian GAAP, firms did not report the components of other comprehensive income (fair value of available-for-sale investment, fair value of cash flow hedges and the change in cumulative foreign currency translation adjustment), the new standards on financial instruments and comprehensive income mirror the US standards (i.e., SFAS 115 and SFAS 133 respectively). Therefore, by using the information provided in the financial statements of cross-listed firms, we are able to obtain actual values for other components of comprehensive income.[18]

To ensure that the market had access to the information in the annual reports, we use the price 3 months after the fiscal year end since Canadian cross-listed firms have 90 days to file their 10-K form with the SEC. All accounting variables are manually collected from their annual reports and are in Canadian currency. When firms disclose the information in US dollars, we convert them into Canadian dollars using the fiscal year end exchange rate for balance sheet items and the average rate for income statement items.

Our research design for price level regressions follows the well-known theoretical work of Ohlson (1995) that expresses the investor's firm value as a function of a firm's book value and abnormal or residual earnings. Similar to Dechow et al. (1999) as well as others (e.g., Graham et al., 2003) we apply the empirical implications of Ohlson (1995) to firms using the valuation function:

$$MVE_{it} = a_0 + a_1 BVE_{it} + a_2 NI_{it} + a_3 v_t \tag{1}$$

where *MVE* equals the market capitalization (price per share times number of shares outstanding) of the firm at time *t*, *BVE* equals the book value of equity at time *t*, *NI* equals net income for the period from $t-1$ to t and v equals other information about future abnormal earnings reflected in the firm's equity value but currently not in the firm's financial statements.

We are interested in determining if stock prices reflect the incremental information that is disclosed in the components of other comprehensive income over book value of equity and earnings. We test their value relevance using the following empirical model that is based on an expanded version of the valuation function in Eq. (1) and is similar to that used in other value relevance research (see e.g., Barth and Clinch, 1996; Rees and Elgers, 1997; Harris and Muller, 1999).

$$PRICE_{it} = a_0 + a_1 BVE\_S_{it} + a_2 NI\_S_{it} + a_3 HEDGE\_S_{it} + a_4 SEC\_S_{it} + a_5 FOREX\_S_{it} + \varepsilon_{it} \tag{2}$$

Where

$PRICE_{it}$ = the price per share 3 months after the end of fiscal year t;
BVE_S_{it} = the book value of common equity at the end of the fiscal year t deflated by the number of outstanding shares;
NI_S_{it} = annual net income after extraordinary items and discontinued operations for the fiscal year t deflated by the number of outstanding shares;
$HEDGE\_S_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t deflated by the number of outstanding shares;
SEC_S_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t deflated by the number of outstanding shares;
$FOREX\_S_{it}$ = the change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t deflated by the number of outstanding shares.

[18] The change in additional minimum pension liability in excess of unrecognized prior service costs is not included in the tests since it is not part of comprehensive income under Canadian standards.

All coefficients other than the coefficient on *HEDGE* in Eq. (2) are expected to be positive. As Venkatachalam (1996) points out, even negative values of the change in the fair value of cash flow hedges may provide risk-relevant information that could be positively associated with returns. A plausible explanation for the losing positions to be viewed as a positive signal is that hedging activities may indicate that firms are proactively managing their risk even when they result in losses. To examine this issue, we modify Eq. (2) to introduce an interaction variable, $HEDGE\_GAIN\_S_{it}$, which is defined as $GAIN * HEDGE\_S_{it}$, where *GAIN* is an indicator variable equal to 1 if the firm has a winning cash flow hedging position for that year and equal to 0 otherwise. $HEDGE\_S_{it}$ is the change in the fair value of cash flow hedges under US GAAP. Eq (2) is modified as follows:

$$PRICE_{it} = a_0 + a_1 BVE\_S_{it} + a_2 NI\_S_{it} + a_3 HEDGE\_S_{it} + a_4 SEC\_S_{it} + a_5 FOREX\_S_{it} + a_6 GAIN_{it} + a_7 HEDGE\_GAIN\_S_{ti} + \varepsilon_{it} \quad (3)$$

If both gains and losses in hedging position are interpreted as positive signals, a_3, the coefficient on *HEDGE_S*, should be negative and $(a_3 + a_7)$ the sum of coefficients on *HEDGE* and $HEDGE * GAIN$ should be positive. We also include the indicator variable *GAIN* in the regression.

To examine the robustness of our results, we investigate the association between market returns and the components of other comprehensive income. We include both market returns and price models since Kothari and Zimmerman (1995) find problems with both functional forms. The estimated slope coefficients are less biased in price models compared to returns models. However, price models have more econometric problems in the form of heteroskedastic specification errors (Christie, 1987; Kothari and Zimmerman, 1995). Further, since market returns models often use change variables, omitted variables should have less of an effect. Inclusion of both the price and the returns models potentially provide more convincing evidence.

Following Bandyopadhyay et al. (1994), Dhaliwal et al. (1999) and Biddle and Choi (2006), we estimate the following model to examine the association between the components of other comprehensive income and stock returns.

$$RET_{it} = b_0 + b_1 NI_{it} + b_2 HEDGE_{it} + b_3 SEC_{it} + b_4 FOREX_{it} + \varepsilon_{it} \quad (4)$$

where all variables other than *RET* are scaled by the value of common equity at the beginning of the fiscal year and,

RET_{it} = stock returns (inclusive of dividends) for the year ended 3 months after the end of fiscal year t;
NI_{it} = net income for the fiscal year t under Canadian GAAP after extraordinary items and discontinued operations;
$HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t;
SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t; and
$FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t.

To be consistent with Biddle and Choi (2006), we run the model with the lagged variables of the components of other comprehensive income in Eq. (4) and estimate the following:

$$RET_{it} = b_0 + b_1 NI_{it} + b_2 HEDGE_{it} + b_3 SEC_{it} + b_4 FOREX_{it} + b_5 NI_{it-1} + b_6 HEDGE_{it-1} + b_7 SEC_{it-1} + b_8 FOREX_{it-1} + \varepsilon_{it} \quad (5)$$

where additional variables are:

$NI_{i,t-1}$ = value of NI_{it} at year $t-1$;
$HEDGE_{it-1}$ = value of $HEDGE_{it}$ at year $t-1$;
$SEC_{i,t-1}$ = value of SEC_{it} at year $t-1$;
$FOREX_{i,t-1}$ = value of $FOREX_{it}$ at year $t-1$.

All coefficients other than the coefficient on *HEDGE* in Eq. (5) are expected to be positive. As in the price model, it is possible that both winning and losing hedging positions are viewed as a signal. Eq. (5) is modified to include an indicator variable *GAIN* and an interactive variable *HEDGE_GAIN* defined as *GAIN* ∗ *HEDGE* where *GAIN* is an indicator variable equal to 1 if the firm has a winning cash flow hedging position for that year and equal to 0 otherwise.

4. Empirical analysis

4.1. Descriptive statistics

Panel A of Table 1 provides descriptive statistics for the variables used in the association tests between market price and changes in the components of other comprehensive income. All variables are deflated by the number of shares outstanding. Panel A of Table 1 indicates that the majority of our sample firms are profitable over the period 1998–2003. Even though the median value is zero for the three components of other comprehensive income, through sample selection, we ensured that at least one of them had a non-zero value. Panel B of Table 1 provides descriptive statistics for the variables used in the association tests between market returns and the components of other comprehensive income. The mean stock returns for our sample of firms for 1998–2003 is around 17% and the mean scaled net income is 4.2%.

Table 2 presents the correlation matrix and the Pearson correlation coefficients. Pane1 A of Table 2 presents the correlation matrix for the variables used in the price model. As expected, the book value of equity and net income are positively correlated with the market value of equity. Panel B presents the correlation matrix for the variables used in the returns model.

4.2. The association between price and the components of other comprehensive income

The results of estimating Eq. (2) are presented as Model 1 in Table 3. The coefficient on book value of common equity (*BVE_S*) is positive, as expected, and significant at the 1% level. The magnitude of the

Table 1
Descriptive statistics.

Variables	Mean	Standard derivation	25%	50%	75%
Panel A: variables used in the association between price and components of other comprehensive income (203 observations)					
$PRICE_{it}$	32	29	15	24	39
BVE_S_{it}	20	28	7	13	24
NI_S_{it}	1.2457	3.1525	0.0754	0.9660	2.4117
$HEDGE\_S_{it}$	−0.0094	0.4291	0.0000	0.0000	0.0000
SEC_S_{it}	−0.6814	7.0299	0.0000	0.0000	0.0000
$FOREX\_S_{it}$	0.0486	0.8185	−0.0561	0.0000	0.0999
Panel B: variables used in the association tests between returns and components of other comprehensive income (203 observations)					
RET_{it}	0.1718	0.5255	−0.2000	0.1200	0.4000
NI_{it}	0.0420	0.1036	0.0063	0.0467	0.0962
$HEDGE_{it}$	−0.0002	0.0129	0.0000	0.0000	0.0000
SEC_{it}	0.0017	0.0284	0.0000	0.0000	0.0002
$FOREX_{it}$	0.0018	0.0293	−0.0027	0.0000	0.0036

Panel A: *where* $PRICE_{it}$ = the price per share 3 months after the fiscal year end; BVE_S_{it} = the book value of common equity at the end of the fiscal year t deflated by the number of outstanding shares; NI_S_{it} = annual net income after extraordinary items and discontinued operations for the fiscal year t deflated by the number of outstanding shares; $HEDGE\_S_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t deflated by the number of outstanding shares; SEC_S_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t deflated by the number of outstanding shares; and $FOREX\_S_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t deflated by the number of outstanding shares.
Panel B: where (all variables other than *RET* are scaled by the value of common equity at the beginning of the fiscal year); RET_{it} = stock returns (inclusive of dividends) for the year ended 3 months after the fiscal year end; NI_{it} = net income for the fiscal year t under Canadian GAAP after extraordinary items and discontinued operations; $HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t; SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t; and $FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t.

Table 2
Correlation matrix and Pearson correlation coefficients.

	$PRICE_{it}$	BVE_S_{it}	NI_S_{it}	$HEDGE\_S_{it}$	SEC_S_{it}	$FOREX\_S_{it}$
Panel A: variables used in the association between price and components of other comprehensive income (203 observations)						
$PRICE_{it}$	1.0000	0.8129	0.2589	−0.0731	−0.5169	0.0314
		(.00)	(.00)	(0.29)	(.00)	(0.98)
BVE_S_{it}		1.0000	0.2023	−0.0459	−0.7421	−0.0011
			(0.00)	(0.51)	(.00)	(0.98)
NI_S_{it}			1.0000	−0.0584	−0.1327	−0.0297
				(0.40)	(0.06)	(0.67)
$HEDGE\_S_{it}$				1.0000	−0.0071	0.0559
					(0.92)	(0.43)
SEC_S_{it}					1.0000	0.0035
						(0.96)
$FOREX\_S_{it}$						1.0000

	RET_{it}	NI_{it}	$HEDGE_{it}$	SEC_{it}	$FOREX_{it}$
Panel B: variables used in the association tests between returns and components of other comprehensive income (203 observations)					
RET_{it}	1.0000	0.1934	−0.2143	0.2589	0.0742
		(0.06)	(0.00)	(0.00)	(0.29)
NI_{it}		1.0000	0.0156	−0.0042	0.0114
			(0.82)	(0.95)	(0.87)
$HEDGE_{it}$			1.0000	−0.2125	0.1201
				(0.00)	(0.09)
SEC_{it}				1.0000	−0.0065
					(0.92)
$FOREX_{it}$					1.0000

Panel A: *where*: $PRICE_{it}$ = the price per share 3 months after the fiscal year end; BVE_S_{it} = the book value of common equity at the end of the fiscal year t deflated by the number of outstanding shares; NI_S_{it} = annual net income after extraordinary items and discontinued operations for the fiscal year t deflated by the number of outstanding shares; $HEDGE\_S_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t deflated by the number of outstanding shares; SEC_S_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t deflated by the number of outstanding shares; and $FOREX\_S_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t deflated by the number of outstanding shares.
Panel B: where (all variables other than *RET* are scaled by the value of common equity at the beginning of the fiscal year); RET_{it} = stock returns (inclusive of dividends) for the year ended 3 months after the fiscal year end; NI_{it} = net income for the fiscal year t under Canadian GAAP after extraordinary items and discontinued operations; $HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t; SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t; and $FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t.
p-Values are reported in parentheses.

coefficient (0.95) is consistent with historical-cost accounting, which does not recognize increases in fair value. The coefficient of net income (*NI_S*) is also positive, as expected, and significant at the 5% level. The value of the coefficient (0.89) reveals that transitory items are included in net income (recall that we use net income after extraordinary items and discontinued operations). The coefficient on the change in the fair value of available-for-sale investments (*SEC_S*) is positive and significant at the 1% level, while the coefficient on the change in fair value of cash flow hedges (*HEDGE_S*) and the change in cumulative foreign currency translation adjustment (*FOREX*) do not have statistically significant relation with market price. The adjusted R^2 is high, which is expected when the book value of common equity is added to the regression.

To further investigate the market valuation of cash flow hedges, we estimate Eq. (3), which includes the interaction variable (*HEDGE_GAIN*) to account for losing and winning hedging positions and an indicator variable (*GAIN*) to account for differences in the intercept. The results are presented as Model 2 in Table 3. The coefficient on the interactive variable is positive and significant at the 10% level, while the coefficient on *HEDGE* is negative and significant at the 10% level. Although the winning position (*HEDGE* ∗ *GAIN*) is incrementally positively priced, the sum of coefficients on *HEDGE* and *HEDGE* ∗ *GAIN* is positive, but not statistically different from zero.

Table 3
Tests of association between price and the components of other comprehensive income.

Independent variables	Model 1		Model 2	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Intercept	12.6878	7.82***	11.4170	6.69***
BVE_S_{it}	0.9506	15.44***	0.9230	14.93***
NI_S_{it}	0.8900	2.33**	0.8920	2.37**
$HEDGE\_S_{it}$	−1.7581	−0.64	−6.0415	−1.92*
SEC_S_{it}	0.7815	3.12***	0.6765	2.71***
$FOREX\_S_{it}$	1.3024	0.90	0.9267	0.65
$GAIN_{it}$			4.7803	1.47
$HEDGE\_GAIN\_S_{it}$			12.8099	1.66*
No of observations	203		203	
F-Value	86.86		65.29	
Adjusted R^2	68.00%		69.02%	

Where: $PRICE_{it}$ = the price per share 3 months after the fiscal year end; BVE_S_{it} = the book value of common equity at the end of the fiscal year t deflated by the number of outstanding shares; NI_S_{it} = annual net income after extraordinary items and discontinued operations for the fiscal year t deflated by the number of outstanding shares; $HEDGE\_S_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year t deflated by the number of outstanding shares; SEC_S_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year t deflated by the number of outstanding shares; $FOREX\_S_{it}$ = the change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year t deflated by the number of outstanding shares; $GAIN_{it}$ = an indicator variable equal to 1 if the firm has a winning cash flow hedging position for that year and equal to 0 otherwise; and $HEDGE\_GAIN\_S_{it}$ = multiplicative variable defined as $GAIN * HEDGE\_S$.

* Significantly different from 0 at 10% level.
** Significantly different from 0 at 5% level.
*** Significantly different from 0 at 1% level.

4.3. Association between market returns and the components of other comprehensive income

Recall that Eqs. (4) and (5) examine the association between the components of other comprehensive income and market returns, without and with lagged variables respectively. The estimation results are presented in Panel A of Table 4. We estimate the results without the lagged variables (referred to as Model 1) and with the lagged variables (referred to as Model 2). The coefficient on net income (*NI*) is positive and significant for both models at the 1% and 10% levels respectively. The coefficient on the change in fair value of available-for-sale investments (*SEC*) is also positive and significant, at the 1% level in both models. The sign of the change in the fair value of cash flow hedges (*HEDGE*) is negative and significant at the 1% level in Model 1 and at the 10% level in Model 2. The coefficient on *FOREX* is significant at 10% in Model 2. It is worth noting that the adjusted R^2 is higher when the lagged variables are included in the regression (16.20% vs. 12.40%).

Consistent with our approach in Eq. (3), we further investigate the negative sign on *HEDGE*, by adding an interaction variable (*HEDGE_GAIN)* and an indicator variable (*GAIN*) to Eqs. (4) and (5), as discussed in Section 3.2. Once again we perform one set of tests without the lagged variables (Model 1) and another set of tests with the lagged variables (Model 2). The results are presented in Panel B of Table 4. The results for Model 1 are consistent with the previous analysis. Specifically, the coefficients of *NI* and *SEC* are positive and significant at the 1% level, while the coefficient on *HEDGE* is negative and significant at the 5% level. This result is consistent with the argument of Venkatachalam (1996) that losing hedged positions can also be viewed as a positive signal by the market since it indicates that the firm actively manages its risk. However, the coefficient on the interaction variable (*HEDGE_GAIN*) is positive but not statistically significant at conventional levels. The results for the lagged model (model 2) are similar to those of Model 1.

4.4. Tests of aggregate comprehensive income

As discussed in the literature review section, the empirical evidence on the value relevance of aggregate comprehensive income relative to net income is mixed. Using *as if* numbers, Dhaliwal

Table 4
Tests of association between market returns and the components of other comprehensive income.

Independent variables	Model 1		Model 2	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Panel A: basic model and the lagged model				
Intercept	0.1184	3.17***	0.1347	3.39***
NI_{it}	0.9946	2.98***	0.7488	1.91*
$HEDGE_{it}$	−7.3922	−2.68***	−5.5462	−1.85*
SEC_{it}	4.0972	3.29***	4.5685	3.44***
$FOREX_{it}$	1.7055	1.44	2.2284	1.76*
NI_{it-1}			0.4393	1.44
$HEDGE_{it-1}$			4.6353	1.01
SEC_{it-1}			1.2221	1.51
$FOREX_{it-1}$			−2.0096	−1.23
No of observations	203		177	
F-Value	8.15		5.25	
Adjusted R^2	12.40%		16.20%	
Panel B: basic model and the lagged model controlling for winning versus losing hedging positions				
Intercept	0.0852	1.98**	0.0962	2.10**
NI_{it}	0.9712	2.85***	0.7474	1.88*
$HEDGE_{it}$	−8.1662	−2.46**	−6.2051	−1.77*
SEC_{it}	4.1503	3.32***	4.5736	3.44***
$FOREX_{it}$	1.3807	1.16	1.8218	1.44
$GAIN_{it}$	0.2109	2.06**	0.2652	2.39**
$HEDGE\_GAIN_{it}$	7.3910	0.83	10.7894	1.19
NI_{it-1}			0.3591	1.18
$HEDGE_{it-1}$			4.5446	1.00
SEC_{it-1}			1.2899	1.60
$FOREX_{it-1}$			−2.2499	−1.38
No. of observations	203	177		
F-Value	6.21	4.87		
Adjusted R^2	13.39%	18.02%		

Panel A: where (all variables other than *RET* are scaled by the value of common equity at the beginning of the fiscal year); RET_{it} = stock returns (inclusive of dividends) for the year ended 3 months after the fiscal year end; NI_{it} = net income for the fiscal year *t* under Canadian GAAP after extraordinary items and discontinued operations; $HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year *t*; SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year *t*; $FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year *t*; $NI_{i,t-1}$ = value of NI_{it} at year $t-1$; $HEDGE_{it-1}$ = value of $HEDGE_{it}$ at year $t-1$; $SEC_{i,t-1}$ = value of SEC_{it} at year $t-1$; and $FOREX_{i,t-1}$ = value of $FOREX_{it}$ at year $t-1$.
Panel B: where (all variables other than *RET* are scaled by the value of common equity at the beginning of the fiscal year); RET_{it} = stock returns (inclusive of dividends) for the year ended 3 months after the fiscal year end; NI_{it} = net income for the fiscal year *t* under Canadian GAAP after extraordinary items and discontinued operations; $HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year *t*; SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year *t*; $FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year *t*; $GAIN_{it}$ = an indicator variable equal to 1 if the firm has a winning cash flow hedging position for that year and equal to 0 otherwise; $HEDGE\_GAIN_{it}$ = multiplicative variable defined as $GAIN * HEDGE$; $NI_{i,t-1}$ = value of NI_{it} at year $t-1$; $HEDGE_{it-1}$ = value of $HEDGE_{it}$ at year $t-1$; $SEC_{i,t-1}$ = value of SEC_{it} at year $t-1$; and $FOREX_{i,t-1}$ = value of $FOREX_{it}$ at year $t-1$.
* Significantly different from 0 at 10% level.
** Significantly different from 0 at 5% level.
*** Significantly different from 0 at 1% level.

et al. (1999) find little evidence that aggregate comprehensive income is more value-relevant that net income. However, Biddle and Choi (2006) and Chambers et al. (2007) document results that contradict Dhaliwal et al. (1999). Using a sample of Canadian cross-listed firms, we re-examine this issue to provide further insights.

Table 5 presents the results of the tests of the value relevance of aggregate comprehensive income and net income using both a price model (Panels A and B) and a returns model (Panels C and D). In Panel A, Model 1 uses net income, while Model 2 is based on aggregate comprehensive income. As

indicated in Panel A, both net income and aggregate comprehensive income are value-relevant in explaining price. However, aggregate comprehensive income is more strongly associated with price in terms of explanatory power. The same conclusion holds in Panel C when a returns model is used. That is, the association between returns and aggregate comprehensive income is stronger than the association between returns and net income (with and without lagged variables). For both models, the Vuong's *Z*-statistic (Vuong, 1989) is significant in favour of aggregate comprehensive income,

Table 5
Tests of aggregate comprehensive income.

Independent variables	Model 1		Model 2	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Panel A: price model				
Intercept	14.9669	10.08***	12.5939	7.86***
BVE_S_{it}	0.8101	19.12***	0.9661	18.55***
NI_S_{it}	0.9235	2.38**		
CI_S_{it}			0.8461	4.12**
No of observations	203		203	
F-Value	203.18		219.90	
Adjusted R^2	66.69%		69.83%	

Model	Intercept	BVE_S_{it}	$COMP_{SEC}$	$COMP_{Hedge}$	$COMP_{Forex}$	Adj. R^2
Panel B: components of other comprehensive income–price model (*t-statistic in brackets*)						
1	12.6821 (7.90***)	0.9606 (18.51***)	0.8225 (4.00***)			68.29%
2	15.0060 (10.09***)	0.8119 (19.16***)		0.8713 (2.24**)		66.59%
3	14.8995 (10.04***)	0.8095 (19.15***)			0.9538 (2.52**)	66.80%

Independent variables	Model 1		Model 2		Model 3		Model 4	
	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic.	Coefficient	*t*-Statistic	Coefficient	*t*-Statistic
Panel C: returns model								
Intercept	0.1306	3.33***	0.1515	3.56***	0.1234	3.21***	0.1374	3.31***
NI_{it}	0.9811	2.80***	0.7956	1.90*				
NI_{it-1}			0.2731	0.88				
CI_{it}					1.1222	3.50***	1.0544	3.04***
CI_{it-1}							0.2813	1.43
Observations	204		177		204		177	
F-Value	7.81		3.67		12.24		6.79	
Adjusted R^2	3.26%		2.95%		5.27%		6.18%	

Model	Intercept	$COMP_{SEC}$	$COMP_{Hedge}$	$COMP_{Forex}$	Adjusted R^2
Panel D: components of other comprehensive income–returns model (*t-statistic in brackets*)					
1	0.1171 (3.03***)	1.2503 (3.74***)			6.06%
2	0.1371 (3.49***)		0.8296 (2.37**)		2.24%
3	0.1280 (3.28***)			1.0010 (2.98***)	3.76%

Where: NI_{it} = net income for the fiscal year *t* under Canadian GAAP after extraordinary items and discontinued operations scaled by the value of common equity at the beginning of the fiscal year; $NI_{i,t-1}$ = value of NI_t at year $t-1$; CI_{it} = comprehensive income for the fiscal year *t* scaled by the value of common equity at the beginning of the fiscal year; $CI_{i,t-1}$ = value of CI_t at year $t-1$; BVE_S_{it} = the book value of common equity at the end of the fiscal year *t* deflated by the number of outstanding shares; NI_S_{it} = annual net income after extraordinary items and discontinued operations for the fiscal year *t* deflated by the number of outstanding shares; CI_S_{it} = annual comprehensive income for the fiscal year *t* deflated by the number of outstanding shares; $COMP_{SEC}$ = net income adjusted for the change in the fair value of available-for-sale investments under US GAAP for the fiscal year *t* $COMP_{Hedge}$ = net income adjusted for the change in the fair value of cash flow hedges under US GAAP for the fiscal year *t*; and $COMP_{Forex}$ = net income adjusted for the change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year *t*.

* Significantly different from 0 at 10% level.
** Significantly different from 0 at 5% level.
*** Significantly different from 0 at 1% level.

Table 6
Predictive tests.

Independent variables	Model 1		Model 2		Model 3	
Panel A: predictability of future earnings						
Intercept	0. 0361	5.05***	0.0384	4.98***	0.0357	4.94***
NI_{it}	0.3324	6.63***			0.3329	6.46***
CI_{it}			0.1384	3.63***		
$HEDGE_{it}$					0.2020	0.25
SEC_{it}					0.1120	0.71
$FOREX_{it}$					−0.0077	−0.03
Observations	178		178		178	
F-Value	43.96		13.21		10.98	
Adjusted R^2	19.53%		6.45%		18.40%	
Panel B: predictability of future cash flows from operations						
Intercept	0. 1115	8.33***	0.1102	8.30***	0.1078	8.23***
NI_{it}	0.1317	1.49			0.1061	1.20
CI_{it}			0.1371	2.25**		
$HEDGE_{it}$					−2.3727	−1.64
SEC_{it}					0.7631	2.90***
$FOREX_{it}$					−0.0258	−0.05
Observations	150		150		150	
F-Value	2.22		5.07		3.35	
Adjusted R^2	0.81%		2.66%		5.93%	

Where: NI_{it} = net income for the fiscal year *t* under Canadian GAAP after extraordinary items and discontinued operations scaled by the value of common equity at the beginning of the fiscal year; and CI_{it} = comprehensive income for the fiscal year *t* scaled by the value of common equity at the beginning of the fiscal year; $HEDGE_{it}$ = the change in the fair value of cash flow hedges under US GAAP for the fiscal year *t*; SEC_{it} = the change in the fair value of available-for-sale investments under US GAAP for the fiscal year *t*; and $FOREX_{it}$ = change in cumulative foreign currency translation adjustment under US GAAP for the fiscal year *t*.
** Significantly different from 0 at 5% level.
*** Significantly different from 0 at 1% level.

which indicates that aggregate comprehensive income has better association with firm performance than net income.

To gain further intuition on the value relevance of other comprehensive income, Dhaliwal et al. (1999) examine whether the addition of each individual component of other comprehensive income to net income improves the association between net income and stock returns. We conduct a similar analysis and present the results using the price model in Panel B and using the returns model is Panel D. The results of the returns model indicate that the addition of holding gains or losses on cash flow hedges ($COMP_{Hedge}$) and the change in cumulative foreign currency translation adjustment ($COMP_{Forex}$) seem to add noise to net income. The result for $COMP_{Hedge}$ is not surprising since the previous analysis indicated that both a winning position and a losing position may signal risk management. Therefore, when there is no distinction between the two positions, it is difficult to interpret the coefficient. Also, consistent with previous tables, including holding gains and losses on available-for-sale securities with net income results in the highest adjusted R^2.[19]

Panel A of Table 6 examines the ability of net income (Model 1) and aggregate comprehensive income (Model 2) to predict future net income. The results presented in Panel A of Table 6 suggests that net income is a better indicator of future net income than aggregate comprehensive income.[20] This result is not surprising since non-core-business items are included in other comprehensive income. In

[19] As seen in the Panels B and D, two of the three components of other comprehensive income (*HEDGE* and *FOREX*) add noise to the regression. The presence of these two items that are transitory in nature may explain the lower coefficient that we obtain for comprehensive income compared to net income in Panel A. However, the third component (*SEC*) increases the predictive power of the regression, which is consistent with the higher adjusted R^2 for the comprehensive income model.

[20] The Vuong's *Z*-statistic is significant in favour of net income, which indicates that net income is a better predictor of firm performance than aggregate comprehensive income.

other words, the components of other comprehensive income are transitory in nature, i.e., a holding gain or loss on these items in a given year does not imply that the same situation will occur in the future.

Panel B of Table 6 examines the ability of net income and aggregate comprehensive income to predict future cash flows from operations. The results indicate that aggregate comprehensive income is a better predictor of future cash flows than net income. To gain further insights on these results, we examine the predictive power of individual components of other comprehensive income in Model 3. As seen in Panel B, the ability of aggregate comprehensive income to predict future cash flows from operations is driven by the presence of holding gains and losses on available-for-sale securities (*SEC*). To the extent that firms have positive free cash flows (cash flows from operations less capital expenditures), they may choose to pay down their debt and invest the excess in securities. It could be argued that if a firm does not expect these excess cash flows to continue next year, the investments will be classified as trading securities (indicating the intention to trade in the near future). Conversely, if firms expect these excess cash flows to continue in the following years, the investments are likely to be held for a longer period and hence, will be classified as available-for-sale. In that sense, the holding gains and losses from available-for-sale investments indicate the presence of available-for-sale investments and can be seen as a predictor of future cash flows from operations.

There seems to be some tension in the results: comprehensive income appears to be closely related to market values and returns, but it is inferior in terms of its association with future earnings. This finding is likely driven by the transitory nature of the components of other comprehensive income. Our results provide evidence that the inclusion of the components of other comprehensive income improves the relationship with prices and returns and therefore they are value-relevant. However, because these items are transitory in nature, they have less predictive power; consequently, the predictive power of net income should be better than the predictive power of other comprehensive income, i.e., it has less transitory items. We believe that this finding supports the inclusion of the components of other comprehensive income in a different statement and not in the income statement itself. That is, since the results indicate that the components of other comprehensive income are value-relevant, they should be presented in the statement of comprehensive income. Even so, they are transitory in nature and will have relatively poor predictive power. In that regard, they should be excluded from the income statement.

4.5. Additional analysis

We summarize the results of two additional tests in this section.[21] We include several proxies to capture the "other information" component in the Ohlson's valuation model which is not directly included in our Eqs. (2) and (3). The variables we use as proxies for other information are: market-to-book ratio of equity, firm size, and an indicator variable to capture the presence of intangible assets or research and development expenditures. We find that our results are robust to inclusion of these variables. We also include number of shares outstanding as an additional control variable to control for scalar effects and find that the results are qualitatively similar.

Second, we examine the appropriateness of using the data from 3 months after the end of the fiscal year. We hand collected the actual 10-k filing dates for our sample of 203 firm-year observations from EDGAR (http://www.sec.org). The actual filing dates of 190 firm-year observations fall in the third month after the end of fiscal year. For this sample of firms, it is appropriate to use the market price at the end of third month instead of the price at the end of the fiscal year. The results of estimating Eqs. (2) and (3) for the sub-sample of 190 firm-year observations are qualitatively similar to those reported in the tables. For this sub-sample of firm-year observations, we also collect the monthly returns for the third month after the fiscal year end and re-run the tests for the returns models. The results for the returns tests are also qualitatively similar to our main results. These additional tests confirm that our results hold for tests based on both short window (1 month) and long window (12 months) estimation models.

[21] We thank an anonymous referee for these suggestions.

5. Conclusions and limitations

Canadian policymakers have stated that mandating Canadian firms to measure certain financial instruments on the balance sheet at fair value and report changes in the fair value as other comprehensive income in one place on the financial statements is expected to increase consistency in accounting practice, and enhance the transparency and usefulness of financial statements. In this study, we examine the value relevance of the aggregate comprehensive income and components of other comprehensive income. Contrary to the results documented by Dhaliwal et al. (1999), our results suggest that two of the components of other comprehensive income are associated with firm performance as summarized by market price and market returns. We also find that aggregate comprehensive income is more strongly associated (in terms of explanatory power) with both stock price and returns compared to net income and that it is a better predictor of future cash flows. However, we find that net income is a better predictor of future net income relative to comprehensive income. We believe that these results support the argument that the components of other comprehensive income are value-relevant, but are poor predictors of future profitability due to their transitory nature.

The evidence provided in this study supports the requirement that all companies, including non-financial firms, disclose comprehensive income and its components. It also implies that the implementation of fair value accounting and its disclosure in other comprehensive income provide market participants with useful information. It is worth noting, however, that our analysis focuses on Canadian firms that are cross-listed in the US. Therefore, our sample of firms is composed of the largest Canadian firms potentially introducing a size bias in the results. For example, it is possible that these firms are more likely to use hedge accounting as a signal of risk management than smaller firms. Also, these firms are very likely to have operations in both US and Canada, which implies a larger amount of foreign currency translation adjustments.

It is important to note that the value relevance tests are joint tests of relevance and reliability. For example, reporting holding gains and losses in fair value of financial instruments as other comprehensive income enhances relevance, but potentially at the expense of reliability. Rejecting the null hypothesis of no statistically significant relationship between accounting information and market returns is interpreted in this study as evidence that the accounting information is relevant. However, in the absence of a statistically significant association between market returns and the accounting information, it is impossible to conclude that accounting information is irrelevant because the lack of significance could be due to the fact that the reliability component of investors decisions outweighs its relevance. Besides, what we examine in this study is an association relationship rather than causality. Even in the case of statistically significant results, researchers cannot conclude that accounting information caused the prices to change. Therefore, results should be interpreted with caution. Future research might more directly test the value relevance of the comprehensive income components by using the experimental economics methodology.

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