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Essays on Earnings Forecasts, Tax Expense and IFRS Adoption

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By

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Abstract

In this dissertation, I include three essays regarding earnings forecasts, the DuPont analysis and tax expense, all using mandatory International Financial Reporting Standards (IFRS) adoption in Canada as a setting. In the first essay entitled "DuPont Analysis, Earnings Persistence and Return on Equity: Evidence from Mandatory IFRS Adoption in Canada", I propose four new models to forecast one-year-ahead return on equity and change in return on equity based on prior research in the DuPont analysis and earnings persistence. I also examine whether the persistence of return on equity has improved since Canadian companies adopted IFRS in 2011.

In the second essay entitled "Information Content of Tax Expense and the Effect of IFRS Adoption on Tax Expense", I examine the information content of tax expense about future profitability and the effect of IFRS adoption on tax expense. Prior studies (Lev and Nissim, 2004; Hanlon, 2005; Schmidt, 2006; Ayers et al., 2009) use estimated taxable income, book-tax differences and effective tax rates to investigate the relation between income taxes and future earnings. However, those estimated proxies contain measurement errors and might distort the relationship among variables. Tax expense including current, deferred and other income taxes is directly derived from a Compustat account with no estimation error. The main analysis and robustness tests show that tax expense contains more incremental information content about future profitability beyond pre-tax book income than estimated taxable income.

In the third essay entitled "Impact of IFRS Adoption, Value Relevance and Industry Effects: A Canadian Study", I propose a new comparability index to examine the impact of IFRS adoption on the financial statements of firms from different industries. The study demonstrates that deemed cost of property, plant and equipment is the optional exemption that caused the most discrepancy among first-time IFRS adopters; and that only transitional adjustments related to income accounts are value relevant.

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Chapter 1: General Introduction

International Financial Reporting Standards (IFRS) was first issued in 2003 by the International Accounting Standards Boards (IASB) and then has been adopted in more than 100 countries worldwide, including the European Union, Australia and New Zealand.

The accounting standards in Canada are established by the Accounting Standards Board (AcSB). Since the *CICA Handbook* was first published in 1968, Canadian Generally Accepted Accounting Principles (CGAAP) have expanded over time to accommodate the increasing diversity and complexity of business practices. In 2004, the AcSB acknowledged the increasing trend to global convergence of accounting standards and decided to seek public input on a new strategic plan. Based on the feedback and other factors, in early 2005, the AcSB concluded that publicly accountable enterprises should choose between US GAAP or IFRS as the appropriate basis of reporting.

Considering (1) US GAAP is developed by the Financial Accounting Standards Board (FASB) for serving the public interest of the US capital markets only; (2) many Canadian publicly accountable enterprises with a small market capitalization were unwilling to apply detailed and extensive US GAAP; and (3) selecting US GAAP would be a more difficult path to achieving global convergence than direct adoption of IFRS (AcSB, 2011), in January 2006, the AcSB decided to adopt the mandatory use of IFRS by all publicly accountable enterprises and government business entities.

The AcSB's decision is supported by the proponents of IFRS arguing that (1) IFRS reduces information costs to global businesses because it is less costly for capital market participants to comprehend the financial statements reported under one set of global standards than several local standards (Leuz, 2003; Barth, 2008); (2) countries benefit from the network effects of IFRS in their adoption decisions (Ramanna and Sletten, 2009).

Since Canada adopted IFRS in 2011, there is limited research examining the impact of IFRS adoption on accounting quality, tax expense and financial statements using a Canadian setting. The three essays

included in this dissertation fill this void by (1) investigating the effect of IFRS on the persistence of return on equity; (2) exploring the changes in tax expense and its information content after the transition to IFRS and (3) reporting the direct impact of IFRS on financial statements and key ratios.

The first essay focuses on forecasting future earnings through ratio decomposition and the second essay shifts the attention to the information content of tax expense in order to improve forecast accuracy. Using reconciliation statements between CGAAP and IFRS, the third essay takes advantage of a research design that rules out confounding effects to verify and support the findings from the first two essays.

In addition, this dissertation makes the following contributions: (1) introducing the Granger causality test to the earnings persistence literature and proposing four new models to forecast one-year-ahead return on equity and change in return on equity; (2) proposing a new measure for incremental information content and providing evidence to show that tax expense is a better measure of tax information than estimated taxable income widely used in the taxation literature; and (3) proposing a new common sized comparability index to improve cross-sectional comparison and providing an in-depth analysis regarding the accounting choices made by randomly selected companies from different industries upon mandatory IFRS adoption.

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Chapter 2: Essay One

DuPont Analysis, Earnings Persistence and Return on Equity: Evidence from Mandatory IFRS Adoption in Canada

Abstract

This paper proposes four new models to forecast one-year-ahead return on equity (*ROE*) and change in *ROE* based on prior research into the DuPont analysis and earnings persistence, and also examines whether the persistence of *ROE* has improved upon mandatory IFRS adoption in Canada. Using the Granger causality test to establish the usefulness of additional explanatory variables in forecasting future earnings, I show that the DuPont components are useful in predicting one-year-ahead *ROE*, and that the persistence of *ROE* has worsened since Canadian firms adopted IFRS in 2011. This paper contributes to accounting research in three ways. First, it introduces a new approach to forecasting one-year-ahead *ROE*. Second, this study is the first to adopt the Granger causality test in the earnings persistence literature. Third, it sheds some light on the impact of IFRS adoption on reporting quality in Canada.

1. INTRODUCTION

DuPont analysis is widely used in accounting practice and many financial statement analysis textbooks (e.g., Penman, 2009) to investigate profitability. Prior research has used the DuPont scheme in a forecasting context (Fairfield and Yohn, 2001), capital market studies (Soliman, 2008) and in detecting earnings management (Jansen, Ramnath and Yohn, 2012). However, there has been very little research utilizing the DuPont analysis to forecast future return on equity (*ROE*), which is a critical input to many valuation models (e.g., the residual income model cited by Soliman (2008) on p. 827, which uses *ROE* and other accounting numbers to express firm value.) and widely used in accounting practice to estimate cost of equity. In an applied discipline like accounting, the use of the DuPont components in forecasting future *ROE* has immediate implications for financial accounting research and practitioners in equity analysis, earnings forecasting and capital markets. Profit margin (*PM*) and asset turnover (*ATO*) are primary ratios in financial statement analysis with the property of easy computation, compared to abnormal accruals related models. In this study, I propose a new model to investigate whether the DuPont components are useful in predicting one-year-ahead *ROE*. This paper extends prior studies to forecasting future *ROE* and will benefit academic and investment researchers as well as accounting practitioners.

I utilize the Granger causality test to establish the usefulness of the DuPont components in a forecasting context. The Granger causality is a hypothesis test introduced by Clive Granger, a Nobel laureate, in his 1969 paper in Econometrica (Granger, 1969). In an earnings persistence model using current earnings to forecast future earnings, if the coefficient on a newly added variable is significant, the additional predictor is considered useful in predicting future earnings according to the definition of the Granger causality test. In this paper, I use one-year-ahead *ROE* as the dependent variable and current period *ROE* as the primary independent variable. If profit margin is added as an additional predictor and the coefficient on *PM* is significant, *PM* is considered useful in forecasting one-year-ahead *ROE*. This paper is the first to adopt the Granger causality test in the earnings persistence literature. Prior research widely uses rational expectations (Mishkin, 1983) to test market efficiency in their studies (Sloan, 1996;

Xie, 2001; Fairfield, Whisenant and Yohn, 2003). Because my research focuses on forecasting future earnings, the Granger causality test is more appropriate.

Earnings persistence is an important property of earnings quality and has attracted much attention within financial accounting literature. One line of research is motivated by the assumption that a more persistent earnings number is of higher quality in terms of value-relevance for equity investors (Dechow, Ge and Schrand, 2010). Prior research has investigated earnings persistence using dependent variables measured by operating income scaled by total assets (Sloan, 1996; Xie, 2001), return on assets measured by operating income deflated by contemporaneous total assets (Fairfield et al., 2003), operating income after depreciation deflated by total assets (Richardson, Sloan, Soliman and Tuna, 2005); and return on net operating assets (*RNOA*) measured by income from continuing operations deflated by net operating assets (Richardson, Sloan, Soliman and Tuna, 2006, hereafter RSST). In this paper, I extend prior research by using *ROE* as a dependent variable and examining the persistence of *ROE*.

As of January 1, 2011, Canadian publicly accountable enterprises and government business entities are required to prepare their financial statements in accordance with International Financial Reporting Standards (IFRS) instead of pre-existing Canadian Generally Accepted Accounting Principles (CGAAP). Compared to CGAAP, IFRS adopts different standards for business combinations, consolidation methods of joint ventures and impairment of non-financial assets (Benzacar, 2008). Prior research has failed to provide consistent evidence regarding the effects of IFRS adoption on accounting quality. On one hand, some studies (Barth, Landsman and Lang, 2008; Landsman, Maydewa and Thornock, 2012; Chua, Cheong and Gould, 2012) indicate that IFRS provides higher accounting quality and better information content compared to domestic standards. On the other hand, opponents of IFRS argue that IFRS adoption leads to an increase in earnings management (Callao and Jarne, 2010) and a decrease in financial reporting quality (Paananen and Lin, 2009). In this paper, I examine whether the persistence of *ROE* has improved upon mandatory IFRS adoption in Canada. I use this unique setting for the follow reasons: (1) it is mandatory adoption, therefore, not subject to selection bias and (2) compared to other local GAAPs,

CGAAP is similar to U.S. GAAP and the results from a Canadian study are meaningful to the ongoing debate on potential mandatory IFRS adoption in the U.S.

In this study, first, I develop four new models based on prior research into the DuPont analysis and earnings persistence. In model 1, inspired by Nissim and Penman (2001) where the authors decompose *ROE* into profit margin (*PM*), asset turnover (*ATO*), financial leverage (*FLEV*) and *SPREAD* (i.e., the difference between return on net operating assets and net borrowing cost), I use the DuPont components (i.e., profit margin, asset turnover and the interaction term), financial leverage, net borrowing cost (a substitute for *SPREAD*) and current period *ROE* to predict one-year-ahead *ROE*. In model 2, I replace the DuPont components with the three explanatory variables (i.e., sales growth (*SG*), change in net operating assets turnover (ΔAT) and the interaction term ($SG*\Delta AT$)) used in Richardson et al. (2006) for the prediction. Model 3 (4) is the changes version of model 1 (2), inspired by the findings from Fairfield and Yohn (2001) that a changes model is useful in predicting future change in return on assets.

Second, I collect a sample of Canadian firms adopting IFRS in 2011 from Compustat, with 296 firms and 3,065 observations for the pre-IFRS period from 1987 to 2010, and 473 firms with 746 observations for the post-IFRS period between 2011 and 2013.

Third, I perform four robustness tests. The first one is the replication of Richardson et al. (2006) using Canadian data because models 2 and 4 are based on Richardson et al. (2006) originally using U.S. data. In the second robustness test, I re-run the new models using the profitable firm sample to examine whether some DuPont components are more useful in predicting future *ROE* for profitable firms. I shorten the sample period to 1995-2010 in the third test to eliminate the high inflation period from the late 1980s to early 1990s. In the fourth robustness test, I re-run the new models using the matched sample periods (2003 to 2005 vs. 2011 to 2013) with similar GDP growth to rule out confounding economy-wide effects.

The results show that for the pre-IFRS period, the DuPont components (i.e., profit margin, asset turnover and the interaction term) are significant and useful in predicting one-year-ahead *ROE* in model 1.

The three RSST components (i.e., sales growth, change in asset turnover and the interaction term) are marginally significant in model 2, indicating that the RSST components have less predictive power in forecasting future *ROE* than the DuPont components. Compared to the two levels models, the two changes models have much smaller adjusted R^2s and are less informative about future *ROE*.

In terms of the persistence of *ROE* upon mandatory IFRS adoption in Canada, the reported *ROE* is lower and more widespread under IFRS than CGAAP. Consistent with the Nissim and Penman's (2001) decomposition of *ROE*, lower profit margin and asset turnover, higher net borrowing cost and lower financial leverage for the post-IFRS period are the contributing factors to declining *ROE*.

The four robustness tests show that (1) the model used in Richardson et al. (2006) is applicable to the Canadian context and the results from Canadian data are stronger with higher adjusted R^2 than those from the original study using U.S. data; (2) profit margin (asset turnover) is more (less) informative about future *ROE* for profitable firms; (3) high inflation in the late 1980s and early 1990s does not seem to affect the findings, and the results from the shorter sample period (1995-2010) are very similar to those from the full sample period (1987-2010); (4) the results from the matched sample periods (2003-2005 vs. 2011-2013) are consistent with the findings from the full sample, indicating that the lower persistence of *ROE* in the post-IFRS period is not driven by macroeconomic conditions measured by GDP growth.

This paper contributes to accounting research in three ways. First, it introduces a new approach to forecasting one-year-ahead *ROE*. Second, to the best of my knowledge, this study is the first to adopt the Granger causality test in the earnings persistence literature. Third, it sheds some light on the impact of IFRS adoption on accounting quality in Canada.

The significance of this study is threefold: (1) based on the evidence that the persistence of *ROE* has worsened after Canadian IFRS adoption in 2011, the US and other jurisdictions planning to adopt IFRS in the future need to take precautions against risks of potential declining accounting information quality in their countries; (2) researchers and accounting practitioners in earnings forecasts and capital markets need

to take into account the likelihood of deteriorating persistence of *ROE* under IFRS when they predict future profitability using forecasting models generated under CGAAP or other local GAAPs; (3) the International Accounting Standards Board (IASB) will benefit from the findings of this study when it revises some current standards or proposes new standards in order to continuingly improve financial reporting quality.

The rest of this paper is organized as follows. In section 2, I provide a literature review and propose new models. In section 3, I present research design, data and results. In section 4, I perform four robustness tests. In section 5, I summarize the paper and offer future research directions.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Prior Research in the DuPont Analysis

Fairfield and Yohn (2001) first use the DuPont scheme in a forecasting context and find that disaggregating the change in return on net operating assets (Δ*RNOA*) into the changes in asset turnover and profit margin is useful in predicting one-year-ahead Δ*RNOA*. Soliman (2008) studies the use of the DuPont analysis in capital markets and concludes that the DuPont components contain incremental information content about firms. Jansen et al. (2012) use changes in asset turnover and profit margin in detecting earnings management and find that the DuPont measure has significantly more explanatory power in detecting earnings management than performance-adjusted abnormal accruals.

Prior research has utilized the DuPont analysis in predicting future *RNOA* and Δ*RNOA* (e.g., Fairfield and Yohn, 2001; Soliman, 2008). Despite the important role of *ROE* in capital market research and the popularity of the DuPont components in accounting practice, there is no prior study on forecasting future *ROE* using the decomposition based on profit margin and asset turnover. This paper fills this void by adopting the formula from Nissim and Penman (2001).

Extending the familiar DuPont scheme, Nissim and Penman (2001) outline a ratio structure for accounting-based valuation and decompose *ROE* into *PM, ATO, FLEV* and *SPREAD* as follows:

$$ROE = RNOA + (FLEV \times SPREAD) = PM \times ATO + (FLEV \times SPREAD)$$

Where:

ROE (Return on Equity) = Income from Continuing Operations (Compustat Item #178) deflated by *CSE* (Book Value of Common Equity);

RNOA (Return on Net Operating Assets) = Income from Continuing Operations (#178) deflated by *NOA* (Net Operating Assets);

PM (Profit Margin) = Income from Continuing Operations (#178) / *Sales* (#12);

ATO (Assets Turnover) = *Sales* (#12) / *NOA* (Net Operating Assets);

FLEV (Financial Leverage) = *NFO* (Net Financial Obligations) / *CSE* (Book Value of Common Equity);

SPREAD = *RNOA* (Return on Net Operating Assets) − *NBC* (Net Borrowing Cost);

NBC (Net Borrowing Cost) = *NFE* (Net Financial Expense) / *NFO* (Net Financial Obligations);

NFE (Net Financial Expense) = Core *NFE* (Core Net Financial Expense) + *UFE* (Unusual Financial Expense) = (After Tax Interest Expense (#15) × (1 − Marginal Tax Rate)) + Preferred Dividends (#19) − After Tax Interest Income (#62) × (1− Marginal Tax Rate)) + (Lag Marketable Securities Adjustment (Lag #238) − Marketable Securities Adjustment (#238));

NFO (Net Financial Obligations) = (Debt in Current Liabilities (#34) + Long Term Debt (#9) + Preferred Stock (#130) − Preferred Treasury Stock (#227)) − (Cash and Short Term Investments (#1) + Investments and Advances-Other (#32)).

Compared to the traditional DuPont scheme, the Nissim and Penman's (2001) decomposition has the following benefits: (1) a clear distinction between operating and financing activities; (2) a combination of profitability, efficiency and financial leverage measures; and (3) a solid structure showing drivers of reported earnings.

2.2. Prior Research in Earning Persistence

Sloan (1996) first decomposes total earnings into cash flow and total accruals, and suggests that firms with higher reported accruals tend to have abnormally lower future earnings and stock returns. Xie (2001) further decomposes total accruals into abnormal accruals and normal accruals using the Jones (1991) model and indicates that the overpricing of total accruals is attributable to the abnormal component of accruals. On one hand, Richardson et al. (2005) and Dechow & Dichev (2002) attribute the lower persistence of accruals to estimation error in accruals. On the other hand, Fairfield et al. (2003) indicate that profitability growth may be a contributing factor to the lower persistence of accruals.

As an important measure of accounting quality, earnings persistence is generally estimated as:

$$Earnings_{t+1} = \gamma_0 + \gamma_1 Earnings_t + \varepsilon_{t+1}$$, where ε_{t+1} is the error term.

A higher γ_1 implies a higher persistence in earnings.

Sloan (1996) originally decomposes total earnings into cash flow and accruals:

$$Earnings_{t+1} = \gamma_0 + \gamma_1 CF_t + \gamma_2 Accruals_t + \upsilon_{t+1}$$, where υ_{t+1} is the error term.

If $\gamma_2 < \gamma_1$, it indicates that the accruals component of earnings is less persistent than the cash flow portion (some prior studies use the term of association rather than persistence to interpret the relationship between current period earnings and future earnings).

In follow-up work, Richardson et al. (2006) decompose total operating accruals into sales growth and change in net operating asset turnover in the following model. The results suggest that temporary accounting distortions contribute to the lower persistence of total accruals.

$$RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + e_{t+1}$$

Where:

RNOA (Return on Net Operating Assets) = Income from Continuing Operations (#178) deflated by *NOA* (Net Operating Assets);

SG (Sales Growth) = $[(Sales_t/Sales_{t-1}) - 1]$, where *Sales* is #12;

ΔAT_t (Change in Net Operating Asset Turnover) = $[(Sales_t/NOA_t) - (Sales_{t-1}/NOA_{t-1})] / (Sales_t/NOA_t)$;

e_{t+1} = the error term.

Richardson et al. (2006) examine earnings persistence using *RNOA* as a dependent variable. By definition, *RNOA* is the return on net operating assets, which focuses on the profitability of operating activities. *ROE*, on the other hand, is the return on common equity and measures the profitability of shareholders' investment after deducting the interest expenses charged by debt holders. The difference between *ROA* and *ROE* is the additional return from financial leverage, determined by the firm's capital structure (i.e., debt to equity ratio) and net borrowing cost. Firms with lower net borrowing cost than their *RNOA* are able to increase their *ROE* by taking on more financial leverage.

In this paper, I extend prior research by forecasting future ROE using the DuPont components and propose the first hypothesis as follows:

H1: *The DuPont components are useful in predicting one-year-ahead return on equity*.

2.3. The Persistence of ROE upon Mandatory IFRS Adoption in Canada

IFRS has been adopted in more than 100 countries, including the European Union, China, India, Australia and Canada. In the United States, the Securities and Exchange Commission (SEC) accepts financial statements prepared under IFRS by foreign issuers.

Prior research has failed to provide consistent results regarding the effect of IFRS adoption on accounting quality. On one hand, Barth et al. (2008) examine whether IFRS adoption is associated with higher accounting quality and find that firms adopting IFRS from 21 countries evidence an improvement in accounting quality between the pre- and post-adoption periods. Chua et al. (2012) focus on the three

perspectives of accounting quality (i.e., earnings management, timely loss recognition and value relevance) and find that mandatory IFRS adoption has resulted in better accounting quality than pre-existing Australian Generally Accepted Accounting Principles.

On the other hand, opponents of IFRS argue that the greater managerial flexibility under IFRS in choosing accounting choices results in a decrease in financial reporting quality (Paananen and Lin, 2009). Callao and Jarne (2010) investigate whether IFRS adoption has altered earnings management practices by examining discretionary accruals of 1,408 non-financial firms listed on 11 EU stock markets. The results show that earnings management has intensified since IFRS adoption in the EU. Atwood, Drake, Myers and Myers (2011) use samples of 58,832 firm-year observations from 33 countries during 2002 to 2008 to study the impact of IFRS adoption on earnings persistence. The findings demonstrate that positive earnings reported under IFRS are no more or less persistent than earnings reported under US GAAP and, that negative earnings reported are less persistent under IFRS than US GAAP.

In Canada, some early evidence regarding IFRS adoption reveals a significant impact on financial ratios and public sector accountability. Blanchette, Racicot and Girard (2011) analyse 16 financial ratios drawn from 9 listed companies over a 12 month period and suggest that most ratios have significantly higher volatility computed under IFRS than CGAAP. Rixon (2009) focuses on Canadian Workers Compensation Board's financial statements to examine the impact of IFRS adoption on public sector accountability by exploring fair value accounting for financial instruments. The study shows that IFRS adoption by public sector enterprises would distort their financial positions and key performance indicators.

Using the data from the 150 largest firms in 10 industries, Blanchette, Racicot and Sedzro (2013) show that assets and liabilities are higher under IFRS than CGAAP and the differences are offset in shareholders' equity. Sales and operating revenues are reduced under IFRS compared to CGAAP, but profit is higher and other comprehensive income adjustments are predominantly negative.

Therefore, the impact of IFRS adoption on earnings persistence is an empirical question and the analysis above leads to the following hypothesis (stated in alternative form):

H2: *The persistence of ROE has changed upon mandatory IFRS adoption in Canada*.

2.4. New Models Using the DuPont Components to Predict Future Return on Equity

This paper extends Richardson et al. (2006), where the authors examine earnings persistence using *RNOA* as a dependent variable, by adopting $ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \upsilon_{t+1}$ as a base model. I propose four new models to forecast one-year-ahead *ROE* and ΔROE by adding several independent variables to the base model.

Following Nissim and Penman (2001), I decompose *ROE* into *PM*, *ATO*, *FLEV* and *SPREAD* (see Appendix A for a summary of variable definitions). Because *SPREAD*, the difference between *RNOA* and *NBC* (i.e., net borrowing cost), is highly correlated with other independent variables, I use *NBC* instead of *SPREAD*.

The first model applies Nissim and Penman's (2001) decomposition of *ROE* to a forecasting context by adding five independent variables to the base model of $ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \upsilon_{t+1}$ as follows:

$$ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \gamma_2 PM_t + \gamma_3 ATO_t + \gamma_4 (PM_t * ATO_t) + \gamma_5 FLEV_t + \gamma_6 NBC_t + \upsilon_{t+1} \quad (1)$$

In model 2, I extend the model from Richardson et al. (2006) (i.e., $RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + \upsilon_{t+1}$) by adding *FLEV* and *NBC* as additional independent variables to forecast future *ROE*, based on the Nissim and Penman's (2001) decomposition of *ROE* (i.e, *ROE = RNOA + FLEV * SPREAD*).

$$ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \gamma_2 SG_t + \gamma_3 \Delta AT_t + \gamma_4 (SG_t * \Delta AT_t) + \gamma_5 FLEV_t + \gamma_6 NBC_t + \upsilon_{t+1} \quad (2)$$

Richardson et al.'s (2006) decomposition of *RNOA* is a well-established approach accepted by the accounting community. The purpose of replacing the DuPont components with the variables included in

Richardson et al. (2006) is to establish the usefulness of the DuPont components by comparing their informativeness with that embedded in variables introduced by prior studies.

The third model is the changes version of model 1 inspired by Fairfield and Yohn (2001), which suggests that a changes model is useful in predicting one year ahead $\Delta RNOA$.

$$\Delta ROE_{t+1} = \gamma_0 + \gamma_1 \Delta ROE_t + \gamma_2 \Delta PM_t + \gamma_3 \Delta ATO_t + \gamma_4 (\Delta PM_t * \Delta ATO_t) + \gamma_5 \Delta FLEV_t + \gamma_6 \Delta NBC_t + \upsilon_{t+1} \quad (3)$$

Model 4 is the changes version of Model 2 and is presented as follows:

$$\Delta ROE_{t+1} = \gamma_0 + \gamma_1 \Delta ROE_t + \gamma_2 SG_t + \gamma_3 \Delta AT_t + \gamma_4 (SG_t * \Delta AT_t) + \gamma_5 \Delta FLEV_t + \gamma_6 \Delta NBC_t + \upsilon_{t+1} \quad (4)$$

Because SG_t is defined as sales growth and ΔAT_t represents the change in net operating asset turnover, I keep SG_t, ΔAT_t and the interaction term intact in model 4.

In terms of the predicted sign, for model 1, because

$$ROE = PM \times ATO + (FLEV \times SPREAD)$$

$$= PM \times ATO + (FLEV \times (RNOA - NBC))$$

$$= PM \times ATO + (FLEV \times (PM \times ATO - NBC))$$

$$= (1 + FLEV) \times PM \times ATO - FLEV \times NBC$$

I predict that PM_t and ATO_t have a positive sign because financial leverage is very unlikely less than −1, indicating that firms carry more net financial assets than book value of common equity. For $FLEV_t$ and NBC_t, because only firms with lower net borrowing cost than their *RNOA* can benefit from taking on more financial leverage, the signs on $FLEV_t$ and NBC_t are correlated and unpredictable.

For model 2, based on the prediction from Richardson et al. (2006), SG_t (ΔAT_t) should have a positive (negative) sign. For models 3 and 4, the sign on ΔROE_t is unpredictable due to potential mean reversion.

3. RESEARCH DESIGN AND RESULTS

3.1. Research Method

I use the Granger causality test revised by Wooldridge (2009) to establish the usefulness of the DuPont components. In a base model like $ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \upsilon_{t+1}$, if I add profit margin as an additional independent variable and the coefficient on *PM* is significant, *PM* is considered useful in forecasting future *ROE*, according to the definition of the Granger causality test.

The Granger causality test is a *t* statistic test for forecasting models using current period information (e.g., ROE_t) to predict future values (e.g., ROE_{t+1}). The difference between the Granger causality test and a general *t* statistic test is that the former is for forecasting purposes and the latter is to establish an association between variables. For a general *t* statistic test, there is no restriction on which independent variables should or should not be included in a model as long as multicollinearity is not a serious concern. However, for the Granger causality test, past information (i.e., ROE_t) must be controlled for before introducing an additional explanatory variable (e.g., PM_t) to a forecasting model. There are some prior studies in the earnings forecasts literature (e.g., Fairfield and Yohn, 2001) using a general *t* statistic test for their models. As discussed in Soliman (2008), omitted variables could be an issue for Fairfield and Yohn (2001) where $\Delta RNOA_t$ is not included as part of predictors when forecasting $\Delta RNOA_{t+1}$. The purpose of using the Granger causality test in this study is that including current period information improves forecast accuracy and mitigates the omitted variable issue occurred in some prior studies.

Mishkin (1983) test has been widely used in the earnings persistence literature to test market efficiency. The difference between Mishkin (1983) test and the Granger causality test is that current period *ROE* is not included as an independent variable in the former and required by the latter when forecasting one-year-ahead *ROE*.

In cases where prior studies (e.g., Sloan, 1996) use a model like $Earnings_{t+1} = \gamma_0 + \gamma_1 CF_t + \gamma_2 Accruals_t + \upsilon_{t+1}$, which does not include current period earnings (i.e., $Earnings_t$) as a predictor, the Granger causality test cannot be applied.

3.2. Sample Selection and Variable Measurement

I collect all 2,329 Canadian firms in the 2011 fiscal year from Compustat based on country code — incorporation and select the sample period covering all firm-years between 1987 and 2013 to calculate the Compustat-based variables listed in Appendix A. I eliminate 604 financial services firms (SIC code 6000-6999), 93 firms adopting U.S. GAAP[1] during the sample period, 222 firms adopting IFRS after 2011, 48 firms adopting IFRS before 2011, 688 firms without at least 6 years (i.e., 2007 – 2012) of accounting history, and 378 firms without available data to compute meaningful ratios (e.g., $Sales_t = 0$) for the pre-IFRS period and 201 firms for the post-IFRS period. These restrictions result in a sample of 296 firms and 3,065 observations for the pre-IFRS period, and 473 firms and 746 observations for the post-IFRS period.

For the sake of brevity, I use the average statutory corporate income tax rate of the past 8 years (i.e., 31%) for the marginal income tax in this study and winsorize all financial variables at the top and bottom 1% to mitigate the effect of outliers on the results.

3.3. Results

3.3.1. Descriptive Statistics

I present descriptive statistics of the variables in Table 1. The median *ROE* is 17.3% (8.1%) under CGAAP (IFRS), indicating that *ROE* is lower for the post-IFRS period. *PM* has a median value of 7.0% (5.6%) and standard deviation of 181.0% (476.4%) under CGAAP (IFRS), showing wide variation in operating profitability among the sample firms, and that the reported profitability is lower and more

[1] The Canadian Securities Administrators (CSA) published a new National Instrument 52-107 Acceptable Accounting Principles and Auditing Standards (NI 52-107) to allow foreign issuers, SEC issuers, entities with rate regulated activities, insurance and investment companies and other exempted firms to adopt U.S. GAAP or delay the transition to IFRS for fiscal years beginning on or after January 1, 2011.

widespread under IFRS than CGAAP. The slower *SG* for the post-IFRS period of 19.1%, compared to 22.6% reported under CGAAP, is one of the contributing factors to deteriorating *ROE* and *PM*. On the other hand, the mean *ATO* of 152.2% reported under IFRS is lower than 181.1% under CGAAP, indicating that efficiency is reported worsened under IFRS, which offers another explanation for decreasing *ROE*.

The mean *FLEV* (*NBC*) is 34.0% (5.8%) under IFRS, compared to slightly higher *FLEV* of 39.2% and lower *NBC* of 4.5% under CGAAP. It means due to higher borrowing cost, firms take less advantage of financial leverage upon mandatory IFRS adoption in Canada.

[Insert Table 1 about here]

3.3.2. Pearson Correlation

The Pearson correlation between variables is presented in Table 2. For both sample periods, most correlations do not exceed 50 percent and the variables with a correlation more than 50 percent are not the independent variables included in the same regression model, suggesting that severe multicollinearity is not a concern for multivariate analysis.

[Insert Table 2 about here]

3.3.3. Test of H1 (The Usefulness of the DuPont Components)

I perform OLS regressions to test the usefulness of the DuPont components under both accounting regimes. The results regarding model 1 from the Panel A of Table 3 show that the coefficients on all DuPont components (i.e., *PM*, *ATO* and *PM*ATO*) are significantly different from zero and in line with the predicted sign. Therefore, based on the definition of the Granger causality test, the DuPont components are useful in forecasting one-year-ahead *ROE*, which supports H1. Model 1 has a relatively higher adjusted R^2 of 33.1% compared to other forecasting models included in prior studies (e.g., the adjusted R^2s of four models in Soliman (2008) range from 16.8% to 19.8%), indicating that the levels

model using the DuPont components effectively captures the dynamic process of firm level profit generation.

FLEV and *NBC* are also useful in predicting future *ROE* in terms of the significance of their coefficients in model 1. For the pre-IFRS period, both *FLEV* and *NBC* have a positive coefficient. One of the explanations for this result is that *NBC* is positively associated with inflation and shareholders demand higher *ROE* when inflation is high.

Model 2 is the levels model based on Richardson et al. (2006), using *SG,* ΔAT and *SG**ΔAT as independent variables to replace *PM, ATO* and *PM*ATO*. The coefficients on all RSST components (i.e., *SG,* ΔAT and *SG**ΔAT) are only marginal significant, suggesting that the DuPont components are more informative about future *ROE* than the current accruals quality measures.

Model 3 is the changes version of model 1. The adjusted R^2 of model 3 drops to 9.78% from 33.1% in model 1. This indicates that the changes model has less explanatory power than the levels model. The coefficients on ΔPM and ΔATO are still significant and useful in predicting future ΔROE. Model 4 is the changes version of model 2 derived from Richardson et al. (2006) and its adjusted R^2 of 9.34% is much lower than that of model 2, consistent with the findings from models 1 and 3.

In terms of the autocorrelation in model 1, I run the Durbin-Watson test for both sample periods. The Durbin-Watson statistics for the pre-IFRS (post-IFRS) period is 1.94 (1.90), very close to 2, which suggest that autocorrelation is not a concern for model 1.

3.3.4. Test of H2 (Change in the Persistence of ROE upon Mandatory IFRS Adoption)

Due to data restrictions and reduced explanatory power of the changes models, for the post-IFRS period, I only perform OLS regressions for models 1 and 2. The results from the Panel B of Table 3 show

that *PM* and *PM*ATO* are still useful in forecasting future *ROE* in model 1, and that two RSST components are insignificant in model 2, in line with the findings from the pre-IFRS period.

The Panel C of Table 3 compares the coefficients on independent variables for the pre- and post-IFRS periods. For models 1 and 2, the differences in the coefficients on all independent variables except current period *ROE* are not significantly different from zero, suggesting that the relationship between those independent variables and one-year-ahead *ROE* has not changed during the transition to IFRS. However, the coefficient on current period *ROE* declined significantly in both models for the post-IFRS period, suggesting that the persistence of *ROE* has worsened upon mandatory IFRS adoption, which supports H2. Lower *PM* and *ATO*, higher *NBC* and lower *FLEV* reported under IFRS than CGAAP (see descriptive statistics) are some of the contributing factors to declining *ROE*.

The rationale behind this finding can be interpreted using the results from a Canadian study. Blanchette et al. (2013) show that the volatility of financial statement figures is generally higher under IFRS than CGAAP, even though IFRS adoption has not significantly changed the mean and median of most accounting figures at the aggregate level after Canadian firms adopted IFRS in 2011. Higher volatility means lower persistence, which is consistent with the conclusion from this study. Blanchette et al. (2013) attribute the lower persistence of accounting numbers under IFRS mainly to fair value accounting, which results in more volatile figures in financial instruments, property, plant and equipment, and impairment of assets.

[Insert Table 3 about here]

4. ROBUSTNESS TESTS

4.1. Replication of Richardson et al. (2006) Using Canadian Data

In the first robustness tests, I replicate RSST using the pre-IFRS sample. The results from Table 4 show that the RSST model (i.e., $ROA_{t+1} = \gamma_0 + \gamma_1 SG_t - \gamma_2 \Delta AT_t - \gamma_3 (SG_t * \Delta AT_t) + \gamma_4 ROA_t + \upsilon_{t+1}$) is applicable to the Canadian context. Using 3,061 observations from Canadian firms between 1987 and 2010, the RSST model produces stronger results with higher adjusted R^2 (i.e., 63.1% using Canadian data vs. 57.6% using U.S. data) and more consistent coefficient on *SG* in line with the predicted sign (i.e., positive sign using Canadian data vs. negative sign using U.S. data), compared to the original study using 106,423 observations from U.S. firms between 1962 and 2001.

I also re-run the RSST model using Canadian data for the post-IFRS period and the results show that the three RSST components lose their explanatory power in forecasting future *RNOA* and the persistence of *RNOA* declined after the transition of IFRS, consistent with the findings from the Panel C of Table 3.

[Insert Table 4 about here]

4.2. Multivariate Analysis of Profitable Firms

After eliminating all firms with negative earnings, I re-run models 1 and 2 using the profitable firm sample to examine whether some DuPont components are more useful in predicting future *ROE* for profitable firms. The results are presented in Table 5. For both sample periods, *PM* and *FLEV* are useful in forecasting future *ROE,* and *ATO* loses its predictive power. Given that in model 1, the coefficient on *PM* increases to 0.134 for the profitable firm sample from 0.018 for the full sample, it suggests that *PM* (*ATO*) is more (less) informative about future *ROE* for profitable firms. The coefficient on *NBC* becomes significantly negative for the post-IFRS period, indicating that *NBC* has a negative relationship with future *ROE* for profitable firms in a short run (i.e., a period of three years). The RSST components remain insignificant for profitable firms, with higher adjusted R^2 of 12.76% for the post-IFRS period.

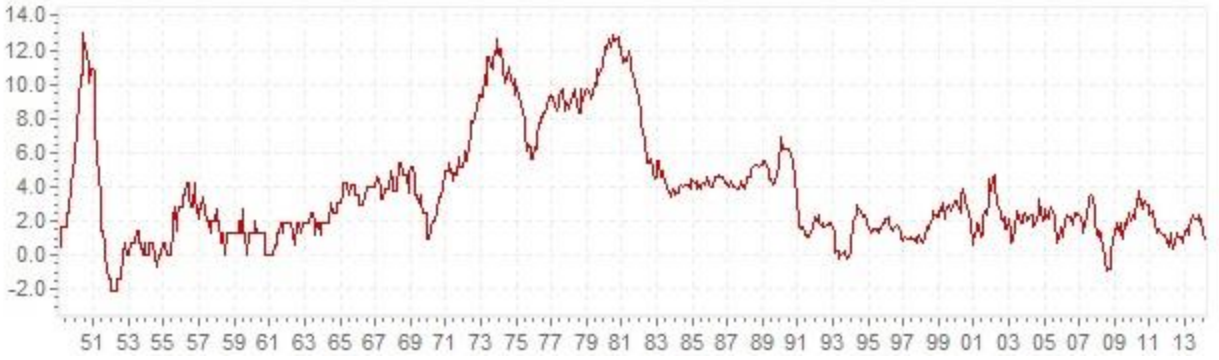
[Insert Table 5 about here]

4.3. Multivariate Analysis Using the Shorter Sample Period

Considering high inflation in the late 1980s and early 1990s (see Figure 1), I shorten the sample period to 1995-2010 and the results presented in Table 6 are very similar to those from the full sample period of 1987 to 2010. The coefficient on *NBC* keeps positive and significant in both models, indicating that high inflation might not be a contributing factor to the positive relationship between *ROE* and *NBC*.

Figure 1

Historic CPI Inflation in Canada (Yearly Basis)



Source: http://www.inflation.eu

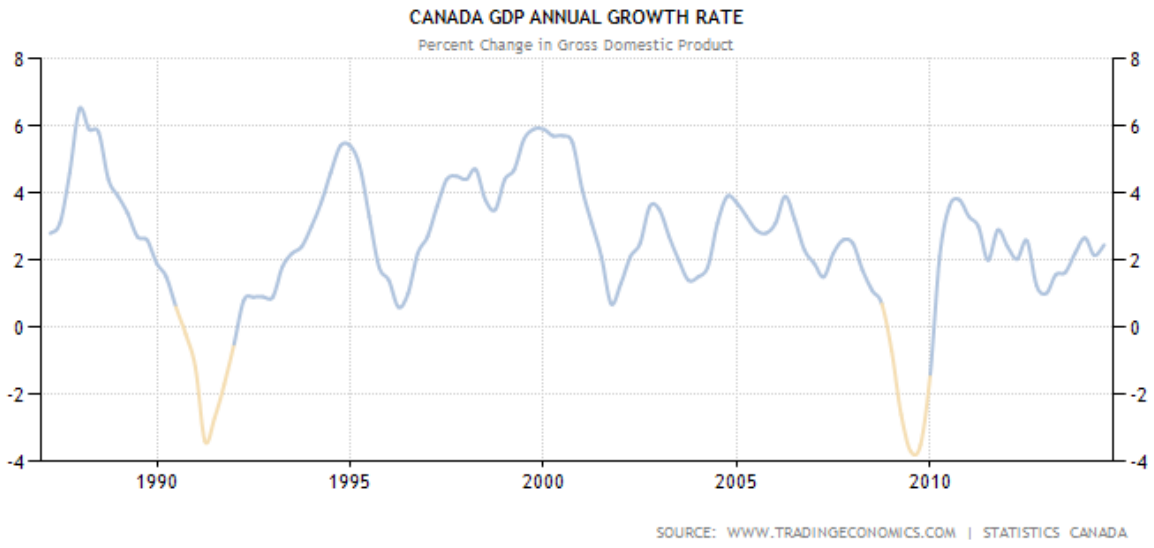
[Insert Table 6 about here]

4.4. Multivariate Analysis Using the Matched Sample Periods

The purpose of this robustness test is to address the concerns about other confounding effects such as macroeconomic factors leading to the change in the persistence of *ROE* upon mandatory IFRS adoption in Canada. The following graph (see Figure 2) of Canada GDP annual growth rate shows that the macroeconomic conditions measured by GDP growth from 2002 to 2006 are very similar to those of the post-IFRS period. Because 2007 is the starting year of financial crisis, I select 2003 to 2005 as the matched sample period for this study.

I re-run models 1 and 2 for 2003 to 2005, and Table 7 indicates that the results from the matched sample periods are very similar to those without controlling for macroeconomic factors and the length of sample period, which means that the deteriorating persistence of *ROE* is not driven by economy.

Figure 2



[Insert Table 7 about here]

5. CONCLUSION

In this study, I propose four new models including two levels models and two changes models to predict one-year-ahead *ROE* and Δ*ROE* based on prior research in earnings persistence and the DuPont analysis. Model 1 applies the Nissim and Penman's (2001) decomposition of *ROE* to a forecasting context by using three DuPont components (i.e., *PM*, *ATO*, *PM*ATO*), *FLEV* and *NBC* as explanatory variables. Model 2 extends Richardson et al. (2006) by forecasting *ROE* instead of *RNOA*. Model 3 (4) is the changes version of model 1 (2). I utilize the Granger causality test to establish the usefulness of explanatory variables and the results show that the DuPont components are useful in predicting one-year-ahead *ROE* and Δ*ROE*. Compared to the DuPont components, the RSST components (i.e., *SG,* Δ*AT* and *SG**Δ*AT*) are less informative about future *ROE* and Δ*ROE*. The results also indicate that the changes models have much less explanatory power than the levels models.

In this paper, I also examine whether the persistence of *ROE* has changed upon mandatory IFRS adoption in Canada. While IFRS offers greater flexibility to managers in selecting accounting policies, managers have a tendency to behave opportunistically in order to mitigate the impact of IFRS adoption on their own benefits. This paper supports this notion by showing that the persistence of *ROE* has worsened during the transition to IFRS.

Some potential caveats of this study are (1) the sample size is relatively small for the post-IFRS period because there are only three years of data available since 2011; (2) current level of decomposition of *ROE* might not fully reflect the dynamic process of firm level business activities; (3) because the firms from the pre-IFRS period have been in business longer than those from the post-IFRS period, survivorship and/or lifecycle bias might be a concern for this study; (4) since financial service firms have been removed from the sample, the results from this study might not be generalizable to all firms. Future research is encouraged to focus on developing more sophisticated models to incorporate further investigation into the four drivers of return on common equity.

Appendix: Notation

ROE (Return on Equity) = Income from Continuing Operations (Compustat Item #178) deflated by *CSE* (Book Value of Common Equity);

CSE = Common Equity (#60) + Preferred Treasury Stock (#227);

RNOA (Return on Net Operating Assets) = Income from Continuing Operations (#178) deflated by *NOA* (Net Operating Assets);

NOA (Net Operating Assets) = (Total Assets (#6) − Cash and Short-Term Investments (#1)) − (Total Liabilities (#181) − Debt in Current Liabilities (#34) − Long-Term Debt (#9));

PM (Profit Margin) = Income from Continuing Operations (#178) / *Sales* (#12);

ATO (Assets Turnover) = *Sales* / *NOA* (Net Operating Assets);

FLEV (Financial Leverage) = *NFO* (Net Financial Obligations) / *CSE* (Book Value of Common Equity);

NFO (Net Financial Obligations) = (Debt in Current Liabilities (#34) + Long Term Debt (#9) + Preferred Stock (#130) − Preferred Treasury Stock (#227)) − (Cash and Short Term Investments (#1) + Investments and Advances-Other (#32));

SPREAD = *RNOA* (Return on Net Operating Assets) − *NBC* (Net Borrowing Cost);

NBC = *NFE* (Net Financial Expense) / *NFO* (Net Financial Obligations);

NFE = Core *NFE* (Core Net Financial Expense) + *UFE* (Unusual Financial Expense) = (After Tax Interest Expense (#15) × (1 − Marginal Tax Rate)) + Preferred Dividends (#19) − After Tax Interest Income (#62) × (1− Marginal Tax Rate)) + (Lag Marketable Securities Adjustment (Lag #238) − Marketable Securities Adjustment (#238));

SG (Sales Growth) = $[(Sales_t/Sales_{t-1}) - 1]$, where *Sales* is #12;

ΔAT_t (Change in Net Operating Asset Turnover) = $[(Sales_t/NOA_t) - (Sales_{t-1}/NOA_{t-1})]/ (Sales_t/NOA_t)$;

$\Delta ROE_{t+1} = ROE_{t+1} - ROE_t$.

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Table 1 **Descriptive Statistics**

Variables	**Mean**	**Standard Deviation**	**25%**	**Median**	**75%**
Pre-IFRS Period					
ROE_{t+1}	0.109	0.409	0.042	0.169	0.267
ROE_t	0.121	0.371	0.039	0.173	0.274
ΔROE_{t+1}	−0.018	0.380	−0.069	−0.004	0.049
ΔROE_t	−0.013	0.380	−0.073	−0.007	0.046
PM_t	−0.257	1.810	0.019	0.070	0.151
ATO_t	1.811	1.903	0.586	1.305	2.322
$PM_t * ATO_t$	0.043	0.491	0.030	0.112	0.184
ΔPM_t	−0.001	1.090	−0.031	−0.000	0.027
ΔATO_t	0.007	1.316	−0.163	0.006	0.180
$\Delta PM_t * ATO_t$	0.007	0.548	−0.058	−0.003	0.045
SG_t	0.226	0.714	−0.032	0.084	0.269
ΔAT_t	−0.102	0.731	−0.152	0.011	0.155
$SG_t * \Delta AT_t$	0.156	0.767	−0.004	0.006	0.051
$FLEV_t$	0.392	1.038	−0.146	0.239	0.720
NBC_t	0.045	0.136	0.008	0.043	0.068
$\Delta FLEV_t$	−0.006	0.823	−0.160	−0.012	0.147
ΔNBC_t	0.003	0.278	−0.014	0.000	0.019
Post-IFRS Period					
ROE_{t+1}	−0.030	0.710	−0.055	0.068	0.147
ROE_t	−0.012	0.868	−0.040	0.081	0.173
PM_t	−0.815	4.764	−0.036	0.056	0.144
ATO_t	1.522	2.588	0.377	0.971	1.834
$PM_t * ATO_t$	0.011	1.209	−0.017	0.079	0.160
SG_t	0.191	0.458	−0.017	0.096	0.301
ΔAT_t	−0.148	1.421	−0.129	0.042	0.217
$SG_t * \Delta AT_t$	0.128	0.657	−0.003	0.006	0.063
$FLEV_t$	0.340	1.255	−0.153	0.213	0.580
NBC_t	0.058	0.249	0.001	0.038	0.067

Table 2 **Pearson Correlation Matrix**

Panel A: Pre-IFRS Period

	ROE_{t+1}	ROE_t	ΔROE_{t+1}	ΔROE_t	PM_t	ATO_t	$PM_t * ATO_t$	ΔPM_t	ΔATO_t	$\Delta PM_t * ATO_t$
ROE_{t+1}	1									
ROE_t	0.541	1								
ΔROE_{t+1}	0.503	−0.345	1							
ΔROE_t	0.170	0.440	−0.300	1						
PM_t	0.307	0.379	−0.013	0.108	1					
ATO_t	0.091	0.115	−0.025	0.036	0.144	1				
$PM_t * ATO_t$	0.054	0.108	−0.001	0.219	0.311	0.019	1			
ΔPM_t	0.054	0.048	0.015	0.105	0.005	0.340	0.064	1		
ΔATO_t	0.411	0.562	−0.058	0.120	0.385	0.090	−0.069	0.020	1	
$\Delta PM_t * ATO_t$	0.041	0.065	−0.039	0.215	0.063	0.035	0.327	0.152	−0.103	1
SG_t	−0.032	0.040	−0.037	0.175	−0.002	−0.068	0.002	0.410	0.107	0.105
ΔAT_t	0.091	0.103	0.022	0.100	0.221	0.108	0.073	0.352	0.434	0.008
$SG_t * \Delta AT_t$	−0.141	−0.132	−0.027	0.035	−0.275	−0.091	−0.129	0.060	0.008	0.034
$FLEV_t$	0.206	0.204	0.049	0.010	0.141	−0.123	0.088	0.006	−0.030	−0.015
NBC_t	0.099	0.066	0.028	0.022	0.038	−0.003	−0.011	0.021	0.006	−0.021
$\Delta FLEV_t$	−0.044	−0.069	0.057	−0.078	−0.013	−0.072	0.008	−0.003	−0.107	0.043
ΔNBC_t	0.012	−0.004	0.017	0.016	0.002	−0.008	−0.021	0.007	−0.023	−0.007

Panel A: Pre-IFRS Period (continued)

	SG_t	ΔAT_t	$SG_t * \Delta AT_t$	$FLEV_t$	NBC_t	$\Delta FLEV_t$	ΔNBC_t
SG_t	1						
ΔAT_t	0.263	1					
$SG_t * \Delta AT_t$	0.499	−0.247	1				
$FLEV_t$	−0.066	0.043	−0.118	1			
NBC_t	0.002	0.040	−0.002	0.097	1		
$\Delta FLEV_t$	0.045	−0.102	0.039	0.306	0.013	1	
ΔNBC_t	0.014	−0.023	0.022	0.003	0.641	0.021	1

(continued on next page)

Panel B: Post-IFRS Period

	ROE_{t+1}	ROE_t	PM_t	ATO_t	$PM_t * ATO_t$	SG_t	ΔAT_t	$SG_t * \Delta AT_t$	$FLEV_t$	NBC_t
ROE_{t+1}	1									
ROE_t	0.076	1								
PM_t	0.172	0.087	1							
ATO_t	−0.023	−0.006	0.106	1						
$PM_t * ATO_t$	0.186	0.112	0.092	−0.171	1					
SG_t	−0.048	0.046	0.094	−0.103	−0.017	1				
ΔAT_t	0.007	0.049	0.343	0.081	−0.092	0.216	1			
$SG_t * \Delta AT_t$	0.001	−0.116	−0.281	−0.106	0.138	0.193	−0.421	1		
$FLEV_t$	0.161	−0.083	0.121	−0.029	0.015	−0.004	0.083	−0.141	1	
NBC_t	−0.044	0.058	−0.020	−0.034	0.076	−0.000	0.023	−0.056	0.037	1

Table 3 **Multivariate Analysis**

Panel A: Pre-IFRS Period

		Model 1	Model 2	Model 3	Model 4
	Predicted Sign	ROE_{t+1}	ROE_{t+1}	ΔROE_{t+1}	ΔROE_{t+1}
Intercept		0.019** (1.97)	0.029*** (3.91)	−0.022*** (−3.39)	−0.019*** (−2.67)
ROE_t	+	0.444*** (21.57)	0.565*** (32.87)		
PM_t	+	0.018*** (4.82)			
ATO_t	+	0.007** (2.15)			
$PM_t * ATO_t$	+	0.120*** (7.80)			
$FLEV_t$	?	0.039*** (6.37)	0.035*** (5.68)		
NBC_t	?	0.185*** (4.12)	0.166*** (3.65)		
ΔROE_t	?			−0.323*** (−17.88)	−0.303*** (−17.28)
ΔPM_t	+			0.022*** (3.64)	
ΔATO_t	+			0.016*** (3.17)	
$\Delta PM_t * \Delta ATO_t$	+			0.017 (1.40)	
$\Delta FLEV_t$	?			0.017** (2.06)	0.018** (2.18)
ΔNBC_t	?			0.030 (1.29)	0.030 (1.28)
SG_t	+		−0.022* (−1.93)		0.002 (0.17)
ΔAT_t	−		0.019* (1.92)		0.028*** (2.69)
$SG_t * \Delta AT_t$	−		−0.019* (−1.81)		−0.003 (−0.31)
Adjusted R^2		33.1%	30.9%	9.78%	9.34%
# of observations		3,065	3,061	3,065	3,061

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (continued on next page)

Table 3 (continued)

Panel B: Post-IFRS Period

	Post-IFRS Period		
		Model 1	Model 2
	Predicted Sign	ROE_{t+1}	ROE_{t+1}
Intercept		−0.031 (−0.98)	−0.039 (−1.31)
ROE_t	+	0.050* (1.72)	0.084*** (2.79)
PM_t	+	0.020*** (3.68)	
ATO_t	+	−0.002 (−0.16)	
$PM_t * ATO_t$	+	0.099*** (4.64)	
$FLEV_t$	?	0.084*** (4.19)	0.100*** (4.82)
NBC_t	?	−0.180* (−1.78)	−0.153 (−1.48)
SG_t	+		−0.110* (−1.81)
ΔAT_t	−		0.015 (0.73)
$SG_t * \Delta AT_t$	−		0.066 (1.44)
Adjusted R^2		8.55%	4.22%
# of observations		746	744

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (continued on next page)

Table 3 (continued)

Panel C: Difference in Coefficients (Post – Pre-IFRS Period)

	Pre-IFRS Period		Post-IFRS Period		Difference (Post – Pre-IFRS Period)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}
ROE_t	0.444***	0.565***	0.050*	0.084***	−0.394***	−0.481***
PM_t	0.018***		0.020***		0.002	
ATO_t	0.007**		−0.002		−0.009	
$PM_t * ATO_t$	0.120***		0.099***		−0.021	
$FLEV_t$	0.039***	0.035***	0.084***	0.100***	0.045	0.065
NBC_t	0.185***	0.166***	−0.180*	−0.153	−0.365	−0.319
SG_t		−0.022*		−0.110*		−0.088
ΔAT_t		0.019*		0.015		−0.004
$SG_t * \Delta AT_t$		−0.019*		0.066		0.085

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

Models:

$$ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \gamma_2 PM_t + \gamma_3 ATO_t + \gamma_4 (PM_t * ATO_t) + \gamma_5 FLEV_t + \gamma_6 NBC_t + \upsilon_{t+1} \quad (1)$$

$$ROE_{t+1} = \gamma_0 + \gamma_1 ROE_t + \gamma_2 SG_t + \gamma_3 \Delta AT_t + \gamma_4 (SG_t * \Delta AT_t) + \gamma_5 FLEV_t + \gamma_6 NBC_t + \upsilon_{t+1} \quad (2)$$

$$\Delta ROE_{t+1} = \gamma_0 + \gamma_1 \Delta ROE_t + \gamma_2 \Delta PM_t + \gamma_3 \Delta ATO_t + \gamma_4 (\Delta PM_t * \Delta ATO_t) + \gamma_5 \Delta FLEV_t + \gamma_6 \Delta NBC_t + \upsilon_{t+1} \quad (3)$$

$$\Delta ROE_{t+1} = \gamma_0 + \gamma_1 \Delta ROE_t + \gamma_2 SG_t + \gamma_3 \Delta AT_t + \gamma_4 (SG_t * \Delta AT_t) + \gamma_5 \Delta FLEV_t + \gamma_6 \Delta NBC_t + \upsilon_{t+1} \quad (4)$$

Table 4 **Replication of Richardson et al. (2006) Using Canadian Data**

Model: $RNOA_{t+1} = \gamma_0 + \gamma_1 RNOA_t + \gamma_2 SG_t - \gamma_3 \Delta AT_t - \gamma_4 (SG_t * \Delta AT_t) + \upsilon_{t+1}$

		U.S. Data	Canadian Data	Canadian Data
		1962 – 2001	Pre-IFRS Period (1987 – 2010)	Post-IFRS Period (2011 – 2013)
	Predicted Sign	$RNOA_{t+1}$	$RNOA_{t+1}$	$RNOA_{t+1}$
Intercept		0.042*** (10.24)	−0.032*** (−3.22)	0.003 (0.08)
$RNOA_t$	+	0.756*** (61.83)	1.370*** (71.46)	0.338*** (8.29)
SG_t	+	−0.102*** (−13.65)	0.085*** (4.98)	0.130 (1.49)
ΔAT_t	−	−0.151*** (−17.06)	−0.032*** (−2.15)	−0.043 (−0.82)
$SG_t * \Delta AT_t$	−	−0.007 (−0.93)	0.008 (0.52)	0.021 (0.205)
Adjusted R^2		57.6%	63.1%	20.2%
# of Observations		106,423	3,061	273

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5 **Multivariate Analysis of Profitable Firms**

		Pre-IFRS Period		Post-IFRS Period	
		Model 1	Model 2	Model 1	Model 2
	Predicted Sign	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}
Intercept		0.037*** (4.02)	0.070*** (8.89)	−0.008 (−0.28)	−0.017 (−0.64)
ROE_t	+	0.522*** (19.99)	0.517*** (20.07)	0.274*** (6.54)	0.210*** (5.46)
PM_t	+	0.134*** (7.94)		0.040*** (3.86)	
ATO_t	+	0.004 (1.52)		−0.006 (−0.67)	
$PM_t * ATO_t$	+	0.008 (0.54)		0.027 (1.17)	
$FLEV_t$	?	0.024*** (4.93)	0.025*** (5.21)	0.105*** (5.30)	0.120*** (6.10)
NBC_t	?	0.028 (0.79)	−0.009 (−0.26)	−0.289*** (−3.60)	−0.316*** (−3.90)
SG_t	+		−0.018* (−1.94)		0.089 (1.57)
ΔAT_t	−		−0.020** (−2.18)		−0.001 (−0.03)
$SG_t * \Delta AT_t$	−		−0.032*** (−2.90)		−0.042 (−0.98)
Adjusted R^2		19.96%	18.60%	14.91%	12.76%
# of observations		2,412	2,412	516	516

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6 **Multivariate Analysis Using the Shorter Sample Period (1995 − 2010)**

		Model 1	Model 2
	Predicted Sign	ROE_{t+1}	ROE_{t+1}
Intercept		0.025** (2.40)	0.033*** (4.03)
ROE_t	+	0.398*** (17.55)	0.540*** (28.75)
PM_t	+	0.019*** (5.05)	
ATO_t	+	0.007* (1.84)	
$PM_t * ATO_t$	+	0.133*** (8.40)	
$FLEV_t$	?	0.038*** (5.45)	0.034*** (4.88)
NBC_t	?	0.211*** (4.40)	0.186*** (3.81)
SG_t	+		−0.022* (−1.87)
ΔAT_t	−		0.022** (2.16)
$SG_t * \Delta AT_t$	−		−0.021* (−1.91)
Adjusted R^2		31.88%	29.21%
# of observations		2,589	2,589

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7 **Multivariate Analysis Using the Matched Sample Periods (2003 – 2005 vs. 2011 – 2013)**

	Pre-IFRS Period (2003-2005)		Post-IFRS Period (2011-2013)		Difference in Coefficients (Post – Pre-IFRS Period)	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}	ROE_{t+1}
ROE_t	0.598***	0.716***	0.050*	0.084***	−0.548***	−0.632***
PM_t	0.020***		0.020***		0.000	
ATO_t	0.025***		−0.002		−0.027	
$PM_t * ATO_t$	0.055		0.099***		0.044	
$FLEV_t$	0.045***	0.038***	0.084***	0.100***	0.039	0.062
NBC_t	0.252***	0.265***	−0.180*	−0.153	−0.432	−0.418
SG_t		−0.010		−0.110*		−0.100
ΔAT_t		−0.008		0.015		0.023
$SG_t * \Delta AT_t$		0.025		0.066		0.041

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

Chapter 3: Essay Two

Information Content of Tax Expense and the Effect of IFRS Adoption on Tax Expense

Abstract

This paper proposes a new measure for incremental information content, and examines whether tax expense contains more incremental information content about future profitability beyond pre-tax book income than estimated taxable income. Inspired by the concept of orthogonalization, the new measure for incremental information content mitigates the multicollinearity among highly correlated accounting measures, and results in consistent estimators for existing explanatory variables after adding a new predictor. The main analysis and robustness tests demonstrate that tax expense contains incremental information content about future profitability and is a better measure of tax information than estimated taxable income embedded with measurement error. This paper also investigates the impact of mandatory IFRS adoption on tax expense and its information content, and the results show that tax expense and its information content have not changed significantly since Canadian firms adopted IFRS in 2011, while the average effective tax rate increased by 1.5 percent for the post-IFRS period.

1. INTRODUCTION

Prior research regarding the relation between income taxes and future earnings has used the ratio of tax-to-book income to predict earnings growth (Lev and Nissim, 2004), book-tax differences to indicate the persistence of earnings (Hanlon, 2005), and estimated taxable income to measure financial performance (Ayers, Jiang and Laplante, 2009). Most previous studies adopt an estimated taxable income based measure as their key explanatory variable (Lev and Nissim, 2004; Hanlon, 2005; Ayers et al. 2009) by grossing-up the current portion of tax expense with the statutory tax rate. However, the effective tax rate reflecting tax expenses is very likely different from the statutory tax rate due to the permanent and temporary differences between accounting rules and tax code (Schmidt, 2006). Therefore, the estimated taxable income based measures derived from the statutory tax rate rather than effective tax rate incur measurement error, leading to distortion of findings. In this study, I propose to use tax expense instead of estimated taxable income as the key tax measure, and investigate whether tax expense contains more incremental information content about future profitability than estimated taxable income.

Another line of research examined in this paper is the association of tax expense and earnings forecasts. Most of prior research in this field focuses on studying analysts' forecasts rather than proposing their own forecasting models. Gerakos and Gramcy (2013) compare five regression-based earnings forecasting models from a random walk model to a comprehensive model including twenty-five predictors, and conclude that a simpler model produces a better prediction. However, multicollinearity among independent variables has not been examined in this study and other papers proposing earnings forecasting models (Fama and French, 2000; Fairfield and Yohn, 2001; Fama and French, 2006; Hou, Dijk and Zhang, 2012; Li and Mohanram, 2014). As accounting-based variables could be highly correlated with each other, multicollinearity is a serious threat to the validity of any OLS-based forecasting model. In this paper, I fill this void by proposing a new approach to examine the incremental contribution of tax expense to future profitability.

Starting from January 1, 2011, Canadian publicly accountable enterprises and government business entities are required to prepare their financial statements under International Financial Reporting Standards (IFRS) instead of prior Canadian Generally Accepted Accounting Principles (CGAAP). In terms of the impact of IFRS adoption on tax related accounts, prior research has failed to provide consistent evidence. On one hand, some studies (Haverals, 2007; Karampins and Hevas, 2013) indicate that IFRS increased effective tax rate and reduced book-tax conformity. On the other hand, Chludek (2011) shows that investors did not react to the new information included in tax accounts for the post-IFRS period. In this paper, I examine whether tax expense and its information content have changed upon mandatory IFRS adoption in Canada. I use the matched sample periods of 2003-2005 versus 2011-2013 in this study for the following reasons: (1) the economic conditions measured by GDP growth are very similar for two periods; (2) the corporate tax rates for the matched sample periods follow a very similar pattern; (3) this setting mitigates the impact of the financial crisis starting from 2007 on the results.

In this study, first, I develop a new measure for incremental information content based on the concept of orthogonalization, following the three steps outlined in Section 3.1.2. As shown by the results, the new approach produces a consistent estimator for pre-tax book income after adding an extra explanatory variable and overcomes the shortcoming of estimator shifting embedded in current earnings forecasting models. The new measure isolates the contribution of tax expense to future profitability by using residual tax expense without correlation with pre-tax book income to address the concern of multicollinearity.

Second, I collect a sample of Canadian firms adopting IFRS in 2011 from Compustat, with 187 firms and 451 observations for the pre-IFRS period from 2003 to 2005, and 187 firms with 288 observations for the post-IFRS period between 2011 and 2013.

Third, I perform two robustness tests. The first one is replacing the current measure in Ayers et al. (2009) with the new measure to see whether the results from the main analysis still hold. In the second robustness test, I use the likelihood ratio to compare the models with residual tax expense (versus those without) to investigate whether the models are significantly different.

The results show that for both sample periods, tax expense contains more incremental information content about future profitability beyond pre-tax book income than estimated taxable income, in line with the prediction of this paper.

In terms of the impact of mandatory IFRS adoption on tax expense and its information content, the reported tax expense is lower and less volatile under IFRS than CGAAP; the overall effective tax rate is 1.5 percent higher for the post-IFRS period. However, in a statistical sense, tax expense and its information content have not increased significantly after Canadian firms adopted IFRS in 2011.

The two robustness tests show that (1) the results from the main analysis hold when the current measure in Ayers et al. (2009) is replaced by the new measure; (2) the forecasting model with residual tax expense is significantly different from the one without for both sample periods, as verified by the likelihood ratio test.

This paper contributes to accounting research in three ways. First, it introduces a new measure for incremental information content to improve the current measure in Ayers et al. (2009). The new approach produces consistent estimators for existing explanatory variables after adding an extra predictor. This research design has immediate implications for investment researchers as well as accounting practitioners in equity analysis, earnings forecasts and capital markets, who strive to provide more accurate earnings forecasts. Second, this study provides evidence that tax expense is a better measure of tax information than estimated taxable income which is widely used in the taxation literature, in terms of forecasting future profitability and mitigating measurement error. As shown in the results, replacing estimated taxable income with tax expense increases the incremental information content of a single tax account by approximately 30 percent. Third, to the best of my knowledge, this paper is the first study regarding the impact of IFRS adoption on tax expense and its information content, and will be meaningful for the ongoing debates about potential IFRS adoption in the United States.

The rest of this paper is organized as follows. Section 2 provides the literature review and proposes two hypotheses. Section 3 presents a new measure for incremental information content, data and results. In section 4, I perform two robustness tests. In section 5, I summarize the paper and offer future research directions.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Prior Research into Income Taxes and Future Earnings

There are only a few prior studies focusing on the relation between income taxes and future earnings. Lev and Nissim (2004) first use the ratio of tax-to-book income to predict earnings growth, and find that the taxable income information about future earnings is incremental to that in accruals and cash flows. As discussed in Lev and Nissim (2004), the ratio of tax-to-book income capturing the differences between GAAP and tax code may predict future earnings growth even in the absence of earnings or tax management.

Further to Lev and Nissim (2004), Kim, Koester and Lim (2014) show that revenue-expense mismatching plays a role in explaining the tax fundamental's ability to predict earnings growth, and that the tax fundamental is more strongly associated with future earnings growth for firms with larger revenue-expense mismatching, using U.S. publicly traded firms over the last four decades.

Hanlon (2005) investigates the role of book-tax differences in indicating the persistence of earnings, and concludes that firm-years with larger book-tax differences have less persistent earnings. The underlying assumption of the study is that the difference between pre-tax financial reporting earnings and taxable income (i.e., book-tax differences) reveals the quality of earnings measured by earnings persistence, because taxable income is less subject to manipulation than book income due to scrutiny from tax authorities.

Blaylock, Shevlin and Wilson (2012) take a further step to investigate why book-tax differences serve as a useful signal of earnings persistence indicated in Hanlon (2005), and find that firms with large positive book-tax differences from upward earnings management (tax avoidance) exhibit lower (higher) earnings and accruals persistence, in line with Hanlon's (2005) conjecture that taxable income is of higher quality than book income.

Offering an alternative explanation to the findings from Hanlon (2005), Drake (2013) finds that controlling for firm life cycle weakens the relation between larger book-tax differences and lower earnings persistence, because different economic events that firms encounter at various life cycle stages are reflected in taxable income versus book income inconsistently.

Building on Lev and Nissim (2004), Ayers et al. (2009) further examine whether taxable income is a useful measure in evaluating firm performance, and suggest that the relative and incremental information content of estimated taxable income to book income are lower for high tax-planning firms and higher for low earnings quality firms. They note that because managers have incentives to report higher book income for financial reporting purposes and lower taxable income for tax purposes, taxable income could be a less manipulated performance measure for financial statement users.

Extending Ayers et al. (2009), Thomas and Zhang (2014) examine the valuation of tax expense and argue that substantial variation in the coefficients on tax expense documented in prior valuation studies is caused by the omission of expected future profitability. The paper re-examines the results from Ayers et al. (2009) and shows that the two quality measures (i.e., effective tax rates and absolute abnormal accruals) become insignificant after controlling for other confounding variables or using a relatively clean sample removing negative or extreme values of pre-tax book income and estimated taxable income, which demonstrates the importance of rigorous research design in accounting studies.

The above prior research regarding the association between income taxes and future earnings consistently shows that the tax component measured by estimated taxable income or book-tax differences contains information content about future earnings.

Most of previous studies in this line of research (e.g., Lev and Nissim, 2004; Ayers et al., 2009) use an estimated taxable income based measure as the key explanatory variable, by grossing-up the current portion of tax expense with the statutory tax rate. However, as discussed in Kager, Schanz and Niemann (2011), the effective tax rate reflecting tax expense depends on firm circumstances and deviates from the statutory tax rate. Schmidt (2006) indicates that the deviation of effective tax rate from the statutory rate is driven by the permanent and temporary differences between taxable income and pre-tax book income such as interest on tax-exempt municipal bonds. Those differences reflect firms' long-term strategies and future prospects; and he finds that there is a positive association between earnings generated by changes in effective tax rates (i.e., the tax change component) and future earnings. Therefore, using estimated taxable income in a regression incurs measurement error due to the difference between effective tax rate and the statutory tax rate. Extending prior research, I propose to use tax expense instead of estimated taxable income as the key explanatory variable.

Tax expense is derived from a Compustat account called "total income taxes", including current, deferred and other income taxes. Using Canadian Tire as an example, its 2011 total (current) income tax expense was $162.9 ($169.3) million. The estimated taxable income calculated using the statutory tax rate (i.e., 28.08 percent) would be $602.9 million (i.e., $169.3/28.08 percent). However, the actual income before income taxes was $629.9 million and the measurement error of $27 (i.e., $629.9 minus $602.9) million reflecting the discrepancy between the actual and estimated taxable income resulted from (1) prior years' tax settlements; (2) change in legislation relating to stock options; (3) adjustments of prior years' tax estimates; and (4) lower income tax rates on earnings of foreign subsidiaries (Canadian Tire, 2011).

Lev and Nissim (2004) outline three reasons for the ratio of taxable income to reported income to inform about earnings growth: (1) it reflects some earnings management activities leading to low earnings

persistence such as the discretionary components of accruals; (2) it reveals managers' estimates of future earnings and cash flows in that firms often smooth current and future taxable income by reducing their total tax liabilities; (3) it captures the differences between accounting rules and tax code. Replacing taxable income with tax expense should improve the predictive power of tax information about future earnings in the following ways: (1) the three reasons illustrated in Lev and Nissim (2004) hold for tax expense as well because estimated taxable income is derived from the current portion of tax expense, and the information revealed by estimated taxable income is reflected in tax expense too; (2) tax expense (estimated taxable income) is a direct (indirect) measure without (with) measurement error.

2.2. Prior Earning Forecast Research

Fama and French (2000) first use a simple cross-sectional partial adjustment regression model to predict change in profitability (i.e., earnings before interest and extraordinary items but after taxes scaled by total assets). In the model, the dependent variable is one-year-ahead change in profitability and explanatory variables include current period change in profitability, the deviation of profitability from its expected value determined by the market-to-book ratio, a dividend payer dummy variable and dividend-to-book value of common equity.

Fairfield and Yohn (2001) apply the DuPont scheme to a forecasting context and use changes in asset turnover and profit margin to forecast one-year-ahead change in return on net operating assets. The study illustrates that ratio disaggregation can be used to improve the forecast accuracy of future profitability.

Extending their previous work, Fama and French (2006) introduce another model to predict future profitability using lagged profitability, accruals, book-to-market ratio, dividends-to-book equity ratio, asset growth and market capitalization (i.e., price times shares outstanding) as explanatory variables.

In order to calculate the implied cost of capital widely used in the capital market literature, Hou et al. (2012) propose a new cross-sectional model to forecast future earnings, and indicate that the earnings forecasts generated by the new model are superior to analysts' forecasts, using a large sample of firms

over 1968-2008. The predictors included in the paper are total assets, dividend payment, a dummy variable for dividend payers, and a dummy variable for firms with negative earnings and accruals. The paper forecasts dollar earnings instead of profitability (i.e., earnings scaled by total assets) commonly used in prior studies.

Extending Hou et al. (2012), Li and Mohanram (2014) present two new models (i.e., the EP model based on persistence in earnings and the RI model based on the residual income) to generate earnings forecasts, and show that the two new models outperform the one proposed by Hou et al. (2012). In the EP model, lagged earnings, a negative earnings dummy variable and the interaction term are included as independent variables; lagged book value and accruals are added to the RI model as extra explanatory variables in addition to the three predictors included in the EP model.

In summary, Gerakos and Gramacy (2013) provide a comprehensive review of regression-based earnings forecasts, and conclude that (1) the models using OLS and lagged net income produce more accurate forecasts; (2) a simpler model leads to a better prediction; (3) winsorizing predictors and using short histories improve results when forecasting scaled net income. The paper compares five earnings forecasting models: (1) random walk; (2) lagged net income as a predictor; (3) lagged net income and negative net income dummy variables as predictors; (4) lagged total assets, dividends, accruals, net income, dividends payer dummy variable variable and negative net income dummy variable as explanatory variables; and (5) the six predictors from the fourth model plus current assets, accounts payable, cash and cash equivalents, cost of goods sold, short term debt, long term debt, inventory, current liabilities, total liabilities, receivables, sales, shareholders' equity, tax expense, advertising, extraordinary items and discontinued operations, interest expense, research and development, and sales, general & administrative expenses, and market value of equity as independent variables.

One explanation for the finding of "the simpler the better" from Gerakos and Gramcy (2013) is that the incremental information content of each newly added predictor has not been investigated individually and

multicollinearity among explanatory variables misleads the forecasts because those accounting-based predictors could be highly correlated with each other.

The above literature review demonstrates that, except for Gerakos and Gramacy (2013) including tax expense in their earnings forecasting model as a predictor, previous studies rarely use tax expense to predict future profitability. In addition, the information content of tax expense has never been examined in prior research. In this paper, I fill this void by adopting a new approach to explore the use of tax expense in a forecasting context and propose the first hypothesis as follows:

H1: *Tax expense contains more incremental information about future profitability beyond pre-tax book income than estimated taxable income.*

2.3. Effect of IFRS Adoption on Tax Expense and Its Information Content

Since 2005, IFRS has been adopted in the European Union and several studies have investigated the impact of IFRS adoption on tax related accounts. Haverals (2007) documents a large impact of 3.8-14.6 percent from an IFRS-based tax accounting on the effective tax rate of Belgian companies using the European Tax Analyzer, a multi-period forward looking program. The paper also shows that the use of IFRS as tax base would increase the effective corporate effective tax rates in all EU member countries from 3.3 percent to 10.1 percent.

McAnally, McGuire and Weaver (2010) study the impact of IFRS adoption on equity-based compensation, and find that IFRS yields lower deferred tax assets and recognized tax benefits for about two-thirds of the option grants and more volatile reported tax items, and that IFRS tax items predict future cash flows more accurately than those under U.S. GAAP, using pro forma analyses through a sample of 1,673 publicly traded U.S. firms.

In terms of the market reaction to IFRS adoption, Horton and Serafeim (2010) investigate the market reaction to, and value-relevance of, information contained in the disclosures required by IFRS, and find

that earnings adjustments attributed to the impairment of goodwill, share-based payments, and deferred taxes are incrementally value-relevant.

Chludek (2011) examines the value relevance of deferred tax disclosures under IFRS using a sample of German firms, and reveals that investors generally do not take into account the information embedded in deferred taxes when assessing firm value, except for large net deferred tax assets, and that about 70 percent of the deferred tax balance persists and deferred tax assets reversed on a more timely basis than deferred tax liabilities.

In order to gain insights on the driving force behind the effect of IFRS adoption, Kager, Schanz and Niemann (2011) suggest that the most important differences between IFRS and tax reporting are related to intangibles and provisions, and that book values reported on IFRS balance sheets are generally higher than tax values, except for inventories.

Istrate (2012) highlights that 85 percent of the 61 listed entities on the Bucharest Stock Exchange revalued buildings for tax reasons, and that the accelerated method of depreciation was more often used for financial reporting purposes after IFRS entered into Romanian accounting.

On the earnings management side, Karampinis and Hevas (2013) investigate whether the adoption of IFRS in Greece affected tax-induced incentives for financial earnings management, and find that IFRS adoption reduced book-tax conformity and attenuated the manipulation of discretionary accruals.

For the earnings forecasts under IFRS, Atwood, Cao, Drake and Myers (2012) examine whether income tax disclosures measured by the ranked ratio of taxable income (minus taxes)-to-net income (i.e., the tax-book ranking) under IFRS or U.S. GAAP is useful for predicting changes in future earnings and cash flow, using 51,999 firm-year observations from 35 countries for 1993 to 2010. The paper finds that the positive association between the tax-book ranking and changes in future earnings is significantly greater for the IFRS sample than for the U.S. GAAP sample.

Overall, prior research has provided conflicting results regarding the effect of IFRS adoption on tax accounts. On one hand, IFRS adoption increased the effective tax rate (Haverals, 2007), reduced book-tax conformity and attenuated earnings management (Karampins and Hevas, 2013); on the other hand, investors did not react to the new information in tax accounts under IFRS (Chludek, 2011).

Therefore, the extent to which IFRS adoption has affected tax expense and its information content about future profitability is ultimately an empirical question and the analysis above leads to the following hypothesis (stated in alternative form):

H2: *Tax expense and its information content have changed upon mandatory IFRS adoption in Canada*.

3. RESEARCH DESIGN AND RESULTS

3.1. Research Method

3.1.1. Current Measure of Incremental Information Content

In terms of information content, Ayers et al. (2009) estimate the relative and incremental information content of estimated taxable income to pre-tax book income using the adjusted R^2s from the following regressions:

$$R_{jt} = \gamma_0 + \gamma_1 \Delta TI_{jt} + \upsilon_{jt} \quad \text{(a3)},$$

$$R_{jt} = \gamma_0 + \gamma_1 \Delta PTBI_{jt} + \upsilon_{jt} \quad \text{(a4)},$$

$$R_{jt} = \gamma_0 + \gamma_1 \Delta PTBI_{jt} + \gamma_2 \Delta TI_{jt} + \upsilon_{jt} \quad \text{(a6)}.$$

Where:

R_{jt} = the buy-and-hold market-adjusted return to security *j* over the 16-month return window starting at the beginning of fiscal year *t* and ending 4 months after the end of fiscal year *t*;

ΔTI_{jt} = the difference in estimated taxable income scaled by the market value of equity at the beginning of the fiscal year for firm *j* from year *t-1* to year *t*;

$\Delta PTBI_{jt}$ = the difference in pre-tax book income minus minority interest, scaled by the market value of equity at the beginning of the fiscal year for firm *j* from year *t-1* to year *t*.

In Ayers et al. (2009), the relative information content is measured by the ratio of the adjusted R^2 from (a3) to the adjusted R^2 from (a4). As pointed out by Raedy (2009), because the test statistic is a function of the difference in the ratios between the comparing samples, it is difficult to interpret the results from regressions, using the current measure of relative information content in Ayers et al. (2009). A higher ratio for low earnings quality firms could be driven by the lower information content of pre-tax book income (i.e., the denominator) when the informativeness of estimated taxable income remains unchanged (i.e., the numerator), which puts the support for its H2 in question.

Ayers et al. (2009) measure incremental information content by the difference in the adjusted R^2 from (a6) and the adjusted R^2 from (a4). The paper uses a changes specification (i.e., changes in estimated taxable income and pre-tax book income) in regressions (a6) and (a4) to mitigate correlated omitted variables and heteroscedasticity. However, the correlation between the two independent variables is not taken into consideration (e.g., no correlation table is included in the paper). Panel B of Table 4 in Thomas and Zhang (2014) shows that ΔPTI_t (change in pre-tax book income per share) and ΔTAX_t (change in tax expense per share) are highly correlated at 0.63. Because the two studies both use U.S. firms from Compustat, and estimated taxable income is derived from tax expense and the top U.S. statutory tax rate, changes in estimated taxable income and pre-tax book income could be highly correlated too, as observed in the Panel B of Table 7 from Thomas and Zhang (2014).

3.1.2. Empirical Analysis

For this paper, because $PTBI_t$ and IT_t are highly correlated with each other, IT_t needs to be converted into two uncorrelated components: one shares the information with pre-tax book income, and the other

contains incremental content beyond pre-tax book income reflecting the differences between accounting rules and tax code. Separating the two components can be accomplished by regressing IT_t on $PTBI_t$, and the residuals represent the component that has not been explained by $PTBI_t$. This research method called orthogonalization has been used in several prior studies (Mansi, Maxwell and Miller, 2004; Fortin, 2007). In Mansi et al. (2004), the authors examine the relation between auditor characteristics (quality and tenure) and the cost of debt financing. Because auditor characteristics are highly correlated with credit ratings (i.e., another control variable), this paper orthogonalizes credit ratings to auditor characteristics, and uses the residuals from the regression of credit ratings on auditor size, tenure, and other control variables to replace credit ratings as an independent variable in their main analysis. Similar to Mansi et al. (2004), I use the residual from the regression of current period tax expense on current period pre-tax book income in my forecasting model to address multicollinearity concerns.

In this paper, I examine the incremental information content of tax expense about future profitability beyond pre-tax book income using the following models:

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + e_{t+1} \quad (1)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 IT_t + e_{t+1} \quad (2)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 IT_t + e_{t+1} \quad (3)$$

Where:

$PTBI_t$ (Pre-Tax Book Income) = pre-tax book income scaled by total assets in year *t*;

IT_t (Tax Expense) = tax expense scaled by total assets in year *t*.

Step 1: regress tax expense on current period pre-tax book income and calculate the residuals denoted as RIT_t;

$$IT_t = \gamma_0 + \gamma_1 PTBI_t + e_t$$

Step 2: regress one-year-ahead pre-tax book income on the residuals from step 1 (i.e., RIT_t) and current period pre-tax book income;

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 RIT_t + \varepsilon_{t+1} \quad (4)$$

Step 3: regress one-year-ahead pre-tax book income on current period pre-tax book income;

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + u_{t+1}$$

If the coefficient on RIT_t is significantly different from zero, it is considered that tax expense contains incremental information content about future profitability beyond pre-tax book income and the magnitude of incremental information content is measured by the difference in the adjusted R^2s from steps 2 and 3. The advantage of this approach is that there is no correlation between two independent variables and the coefficient on $PTBI_t$ (i.e., γ_1) remains unchanged after adding more explanatory variables. This design is specifically important for the research focusing on earnings forecasts and information content because these studies attempt to produce more accurate forecasts by adding more explanatory variables to forecasting models and multicollinearity distorts the estimators (i.e., γ_1 and γ_2), making the task difficult to accomplish.

3.2. Sample Selection and Variable Measurement

Starting with 2,329 Canadian firms in the 2011 fiscal year from Compustat based on country code — incorporation, I collect all firm-years from 2003 to 2005 for the pre-IFRS period and those between 2011 and 2013 for the post-IFRS period to conduct a matched sample analysis for Compustat-based variables as follows:

PTBI (Pre-Tax Book Income) = pre-tax book income scaled by total assets;

IT (Tax Expense) = tax expense scaled by total assets;

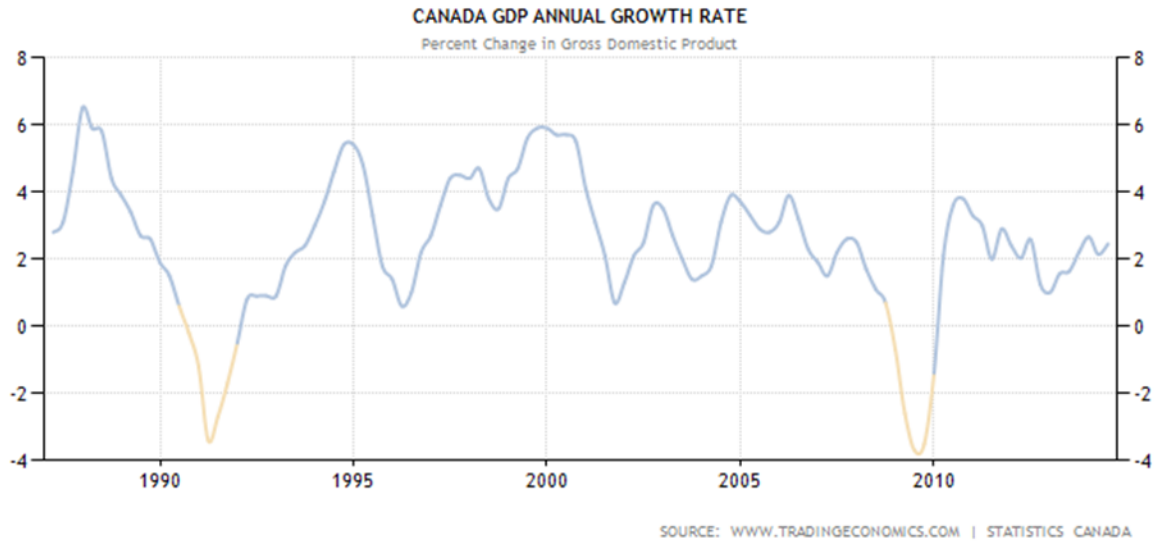
ETI (Estimated Taxable Income) = the current portion of tax expense divided by the statutory tax rate;

RIT (Residual Tax Expense) = the residuals from the regression of current period *IT* on *PTBI*;

RETI (Residual Estimated Taxable Income) = the residuals from the regression of current period *ETI* on *PTBI*.

The graph (see Figure 1) below shows that the macroeconomic conditions in Canada measured by GDP annual growth rate from 2002 to 2006 are very similar to those of the post-IFRS period. I select 2003 to 2005 as the matched sample period for this study to mitigate the impact of the financial crisis starting from 2007 and the confounding effect of economic conditions on the results.

Figure 1



A second graph (see Figure 2) below demonstrates that Canadian corporate tax rates from 2011-2013 followed a very similar pattern to that from 2003-2005, a slightly higher tax corporate rate in the first year and relatively flat rates for the rest of three years, suggesting that the results from the two matched sample periods will not be driven by the variation of corporate rates within the sample period.

I eliminate 604 financial services firms (SIC code 6000-6999), 93 firms adopting U.S. GAAP in 2011, 222 firms adopting IFRS after 2011, 48 firms adopting IFRS before 2011, 688 firms without at least 6

years (i.e., 2007-2012) of accounting history, and 487 firm reporting negative or zero tax expense for the pre-IFRS period and the post-IFRS period. These restrictions result in a sample of 187 firms and 451 observations for the pre-IFRS period, and 187 firms with 288 observations for the post-IFRS period. I winsorize all financial variables at the top and bottom 1 percent to mitigate the effect of outliers on the results.

Figure 2

3.3. Results

3.3.1. Descriptive Statistics

I present descriptive statistics of the variables in Table 1. The median $PTBI_t$ is 9.2 percent (7.6 percent) under CGAAP (IFRS), indicating that the profitability reported under IFRS is lower than that under CGAAP. IT_t has a median value of 2.4 percent (2.1 percent) and standard deviation of 2.8 percent (2.5 percent) under CGAAP (IFRS), showing that tax expense scaled by total assets is lower and less diffuse for the post-IFRS period. Because $PTBI_t$ is 17.4 % lower under IFRS and IT_t only decreases 12.5% for the post-IFRS period, the overall effective tax rate calculated using the median IT_t divided by $PTBI_t$ is 26.1 percent for the pre-IFRS period and 27.6 percent for the post-IFRS period, suggesting a 1.5 (i.e., 27.6-26.1)

percent increase in the effective tax rate under IFRS, consistent with the finding from Haverals (2006) showing a 3.3 percent to 10.1 percent tax hike for all EU member countries for the post-IFRS period. Considering the general trend of decreasing statutory corporate tax rates in Canada over the last 10 years (i.e., approximately 36% in 2003 vs. 28% in 2011), the effect of IFRS adoption on the effective tax rate is expected to be more severe than a moderate 1.5 percent increase if statutory corporate tax rates remain the same for both sample periods.

[Insert Table 1 about here]

3.3.2. Pearson Correlation

The Pearson correlation between variables is presented in Table 2. For both sample periods, $PTBI_t$ is highly correlated with IT_t at 0.575 to 0.447, suggesting that multicollinearity is a concern for multivariate analysis without controlling for the correlation between independent variables, calling for a refinement to the current measure used in Ayers et al. (2009).

[Insert Table 2 about here]

3.3.3. Test of H1 (Incremental Information Content of Tax Expense)

I test H1 for both sample periods using the measure from Ayers et al. (2009) to examine whether tax expense is a better measure of tax information than estimated taxable income in terms of predictive power about future profitability as discussed in Section 2.1. After replacing tax expense in model 3 with estimated taxable income in model 6, I compare the incremental information content of tax expense versus estimated taxable income about future profitability in Table 3.

The results show that for both sample periods, the difference in adjusted R^2s from models 6 and 1 is smaller than that in models 3 and 1. For the pre-IFRS (post-IFRS) period, the incremental information content of estimated taxable income is 0.47 percent (2.53 percent) versus 0.65 percent (3.28 percent) for tax expense and an increase of 0.18 percent (0.75 percent) represents a 38 (30) percent improvement in explanatory power of a single tax account by replacing estimated taxable income with tax expense.

[Insert Table 3 about here]

3.3.4. Test of H2 (Changes in Tax Expense and Its Information Content)

Using the difference in adjusted R^2s between models 1 and 4, the incremental information content of tax expense is measured as 0.65 percent for the pre-IFRS period and 3.28 percent for the post-IFRS period, meaning that tax expense provides more information about future profitability under IFRS. However, Table 4 shows that the difference in the coefficient on RIT_t is not significantly different from zero, suggesting that in a statistical sense, the incremental information content of tax expense about future profitability has not increased significantly upon mandatory IFRS adoption in Canada.

[Insert Table 4 about here]

There are two potential explanations for this finding: (1) there is no significant change in tax expense itself during the transition to IFRS, as shown in Table 5, and/or (2) the incremental information content of tax expense is relatively small for both sample periods (i.e., 0.65 percent for the pre-IFRS period and 3.28 percent for the post-IFRS period).

[Insert Table 5 about here]

4. ROBUSTNESS TESTS

4.1. Test of H1 Using the New Measure

In order to address the concern of multicollinearity identified in Section 3.3.2. (i.e., Pearson Correlation) showing that $PTBI_t$ is highly correlated with IT_t, I also test H1 using the new measure proposed in this paper. Following the steps outlined in Section 3.1.2, I perform OLS regressions to test the incremental information content of tax expense under both accounting regimes. Table 6 shows that the coefficient on RIT_t (i.e., the residuals from the regression of tax expense on current period pre-tax book income) is significantly different from zero for both sample periods, and the difference in the adjusted R^2s

of models 4 and 1 is bigger than that between models 5 and 1, meaning that tax expense contains more incremental information content about future profitability beyond pre-tax book income than estimated taxable income, which supports H1, in line with the results using the current measure from Ayers et al. (2009).

However, one noticeable difference between the new measure using residual tax expense and the current measure using tax expense is that the coefficient on pre-tax book income changes from 0.687 (0.462) to 0.614 (0.383) for the pre-IFRS (post-IFRS) period under the current measure and remains the same when using the new measure (i.e., 0.687 for the pre-IFRS period and 0.462 for the post-IFRS period), after adding an extra predictor.

Because the ultimate goal of any earnings forecasting model is to find the unbiased estimators leading to more accurate forecasts, coefficient shifting after adding an extra explanatory variable is not an ideal design for predicting purposes. In addition, if the incremental information content of each newly added independent variable is not examined individually, more explanatory variables may not improve forecast accuracy due to multicollinearity, as interpreted as "the simpler the better" in Gerakos and Gramacy (2013).

The importance of the above robustness test is to show that the results from the test of H1 using the current measure in Ayers et al. (2009) still hold if the new measure for incremental information content is used instead.

[Insert Table 6 about here]

4.2. Likelihood Ratio Test

I use the likelihood ratio to compare models 1 and 4 for both sample periods. For the pre-IFRS (post-IFRS) period, the likelihood ratio is 8.69 (14.75) and *p*-value is 0.32 percent (0.01 percent), suggesting that model 4 with residual tax expense is significantly different from model 1. This robustness test

demonstrates that the model with tax expense provides incremental information about future profitability beyond pre-tax book income.

5. CONCLUSION

In this study, I propose a new measure for incremental information content to address the concern of multicollinearity embedded in the current measure from Ayers et al. (2009), and examine the information content of tax expense about future profitability beyond pre-tax book income. Building on the concept of orthogonalization, the new measure incorporates residual tax expense in the regression to mitigate the correlation between pre-tax book income and tax expense. This new approach produces a consistent estimator for pre-tax book income after adding tax expense as an extra explanatory variable and overcomes the shortcoming of estimator shifting in current earnings forecasting models.

Extending prior research in the relation between income taxes and future earnings, I show that tax expense is a better measure of tax information than estimated taxable income due to measurement error in the latter. This paper demonstrates that tax expense contains more incremental information content about future profitability beyond pre-tax book income than estimated taxable income.

In this paper, I also examine whether tax expense and its information content have changed upon mandatory IFRS adoption in Canada. While the effective tax rate of Canadian firms increased about 1.5 percent on average for the post-IFRS period, the overall information content of tax expense has not improved significantly due partially to the fact that tax expense itself did not change dramatically after the transition to IFRS.

Some potential caveats of this study are (1) the sample size is relatively small for the post-IFRS period due to the limited data availability since 2011; (2) the model proposed only includes a single tax account as an additional explanatory variable as a result of the scope of this paper ; (3) because the firms from the pre-IFRS period have been in business longer than those from the post-IFRS period, survivorship and/or

lifecycle bias might be a concern for this study; (4) since financial service firms have been removed from the sample, the results from this study might not be generalizable to all firms. Future research is encouraged to incorporate more predictors after controlling for the multicollinearity among independent variables to improve the overall earnings forecast accuracy.

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Table 1 **Descriptive Statistics**

Variables	**Mean**	**Standard Deviation**	**Minimum**	**Median**	**Maximum**
Pre-IFRS Period					
$PTBI_{t+1}$	0.081	0.007	−0.715	0.093	0.386
$PTBI_t$	0.086	0.129	−0.536	0.092	0.418
IT_t	0.030	0.028	0.000	0.024	0.141
ETI_t	0.067	0.080	−0.020	0.046	0.405
RIT_t	0.000	0.023	−0.062	−0.004	0.171
$RETI_t$	0.000	0.070	−0.185	−0.013	0.483
Post-IFRS Period					
$PTBI_{t+1}$	0.046	0.130	−0.475	0.062	0.454
$PTBI_t$	0.067	0.154	−0.979	0.076	0.393
IT_t	0.027	0.025	0.001	0.021	0.132
ETI_t	0.077	0.097	−0.028	0.049	0.510
RIT_t	0.000	0.022	−0.034	−0.007	0.115
$RETI_t$	0.000	0.091	−0.116	−0.025	0.394

Table 2 **Pearson Correlation Matrix**

	$PTBI_{t+1}$	$PTBI_t$	IT_t	ETI_t	RIT_t	$RETI_t$
Pre-IFRS Period						
$PTBI_{t+1}$	1					
$PTBI_t$	0.587	1				
IT_t	0.410	0.575	1			
ETI_t	0.350	0.479	0.817	1		
RIT_t	0.089	0.000	0.818	0.663	1	
$RETI_t$	0.078	0.000	0.617	0.878	0.755	1
Post-IFRS Period						
$PTBI_{t+1}$	1					
$PTBI_t$	0.546	1				
IT_t	0.411	0.447	1			
ETI_t	0.344	0.344	0.826	1		
RIT_t	0.187	0.000	0.895	0.752	1	
$RETI_t$	0.166	0.000	0.716	0.939	0.801	1

Table 3 **Test H1 Using the Current Measure from Ayers et al. (2009)**

	Pre-IFRS Period (2003-2005)			Post-IFRS Period (2011-2013)		
	Model 1	Model 3	Model 6	Model 1	Model 3	Model 6
	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$
Intercept	0.022***	0.010	0.015	0.015***	−0.010	0.0002
	(3.12)	(1.21)	(1.91)	(2.14)	(−1.06)	(0.03)
$PTBI_t$	0.687***	0.614***	0.637***	0.462***	0.383***	0.410***
	(15.38)	(11.30)	(12.57)	(11.01)	(8.36)	(9.35)
IT_t		0.587***			1.108***	
		(2.33)			(3.87)	
ETI_t			0.168**			0.237***
			(2.06)			(3.41)
Adjusted R^2	34.35%	35.00%	34.82%	29.52%	32.80%	32.05%
Difference in adjusted R^2		0.65%	0.47%		3.28%	2.53%
# of observations	451	451	451	288	288	288

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Models:

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + e_{t+1} \quad (1)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 IT_t + e_{t+1} \quad (3)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 ETI_t + e_{t+1} \quad (6)$$

Table 4 **Test H2 by Difference in Coefficients (Post – Pre-IFRS Period)**

	Pre-IFRS Period		Post-IFRS Period		Difference (Post – Pre-IFRS Period)	
	Model 1	Model 4	Model 1	Model 4	Model 1	Model 4
	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$
$PTBI_t$	0.687***	0.687***	0.462***	0.462***	−0.225	−0.225
RIT_t		0.587***		1.108***		0.521
Adjusted R^2	34.35%	35.00%	29.52%	32.80%		
Difference in adjusted R^2		0.65%		3.28%		
# of observations	451	451	288	288		

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

Models:

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + e_{t+1} \quad (1)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 RIT_t + e_{t+1} \quad (4)$$

Table 5 **Change in Tax Expense under IFRS**

t-Test: Two-Sample Assuming Unequal Variances

	Pre-IFRS	Post-IFRS
Mean	0.0301	0.0274
Variance	0.0008	0.0006
Observations	451	288
Hypothesized Mean Difference	0	
df	665	
t Stat	1.38	
p (T<=t) one-tail	0.08	
t Critical one-tail	1.65	
p (T<=t) two-tail	0.17	
t Critical two-tail	1.96	

Table 6 **Test H1 Using the New Measure**

	Pre-IFRS Period (2003-2005)			Post-IFRS Period (2011-2013)		
	Model 1	Model 4	Model 5	Model 1	Model 4	Model 5
	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$	$PTBI_{t+1}$
Intercept	0.022***	0.022***	0.022***	0.015***	0.015***	0.015***
	(3.12)	(3.13)	(3.13)	(2.14)	(2.19)	(2.18)
$PTBI_t$	0.687***	0.687***	0.687***	0.462***	0.462***	0.462***
	(15.38)	(15.45)	(15.43)	(11.01)	(11.28)	(11.21)
RIT_t		0.587***			1.108***	
		(2.33)			(3.87)	
$RETI_t$			0.168**			0.237***
			(2.06)			(3.41)
Adjusted R^2	34.35%	35.00%	34.82%	29.52%	32.80%	32.05%
Difference in Adjusted R^2		0.65%	0.47%		3.28%	2.53%
# of observations	451	451	451	288	288	288

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Models:

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + e_{t+1} \quad (1)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 RIT_t + e_{t+1} \quad (4)$$

$$PTBI_{t+1} = \gamma_0 + \gamma_1 PTBI_t + \gamma_2 RETI_t + e_{t+1} \quad (5)$$

Chapter 4: Essay Three

Impact of IFRS Adoption, Value Relevance and Industry Effects: A Canadian Study

Abstract

This paper proposes a new comparability index to examine the impact of IFRS adoption on the financial statements of firms from different industries. Starting with an overview of Canadian firms adopting various accounting standards in 2011, this paper shows that firms from the utilities industry are more likely to adopt US GAAP rather than IFRS, and resource companies from mining, oil and gas industries represent the majority of early IFRS adopters. Through in-depth analysis of companies from different industries, the study demonstrates that deemed cost of property, plant and equipment is the optional exemption that caused the most discrepancy among first-time IFRS adopters; and that current assets, total assets, retained earnings, shareholders' equity, revenue and other comprehensive income (income taxes) have significantly reduced (increased) when reported under IFRS. This paper also shows that only transitional adjustments related to income accounts are value relevant and firms from various industries were affected differently by IFRS adoption.

1. INTRODUCTION

International Financial Reporting Standards (IFRS) have been adopted by more than 100 countries worldwide. Starting from January 1, 2011, Canadian publicly accountable enterprises and government business entities are required to prepare their financial statements according to IFRS rather than pre-existing Canadian Generally Accepted Accounting Principles (CGAAP).

As firms adopting IFRS for the first time are required to provide at least one year of comparative information restated to IFRS, it results in two sets of financial statements reported under IFRS and CGAAP for the same period (e.g., January 1 to December 31, 2010), which provides a perfect setting to investigate the impact of IFRS adoption on firms' financial statements because economic fundamentals of those firms were kept the same for year 2010 and other confounding factors other than accounting standard change can be ruled out.

In terms of the impact of IFRS on financial statements, prior research has failed to provide consistent results. On one hand, Hellman (2011) indicates that on average net profit reported under IFRS was 24.1 percent higher than that under Swedish GAAP; on the other hand, Tsalavoutas and Evans (2010) conclude that it was difficult to predict the sign of overall impact of IFRS adoption because a similar number of companies were affected negatively and positively.

The purpose of this paper is to document the impact of IFRS adoption on the financial statements of Canadian public companies adopting IFRS in 2011, and to investigate whether the transitional adjustments made under IFRS are value relevant. I conduct my investigation using hand collected reconciliation statements between IFRS and CGAAP of 65 randomly selected Canadian listed companies from thirteen industries. Specifically, I investigate the impact of IFRS adoption on financial statements through both Gray's (1980) comparability index widely used in prior studies and the newly proposed common sized comparability index showing the economic significance of effects. In this paper, I also examine whether industry profile plays a role during the transition to IFRS through randomly selected companies from different industries.

The results from the overview of Canadian firms in 2011 show that (1) utilities companies are more likely to adopt US GAAP rather than IFRS; (2) resource companies from mining, oil and gas industries have a tendency to be an early adopter of IFRS. The findings from the analysis of thirteen companies from different industries indicate that (1) deemed cost of property, plant and equipment is the optional exemption causing the most discrepancy among firms adopting IFRS for the first time; (2) the overall impacts on total assets, retained earnings, shareholders' equity and net comprehensive income are difficult to predict because there is no clear pattern for the sign of changes at the firm level.

After enlarging the sample size to 65 companies, the results show that current assets, total assets, retained earnings, shareholders' equity, revenue, other comprehensive income (income taxes) have significantly decreased (increased) under IFRS while key financial ratios including return on assets, return on equity, profit margin, asset turnover, debt to equity ratio and effective tax rate show no clear direction of change. The paper also indicates that the transitional adjustments made on income accounts under IFRS are value relevant, verified by the bootstrapping approach.

Through the analysis at the industry level, this paper shows that (1) the companies in the machinery industry are more likely to revalue their fixed assets and experience transitional adjustments related to foreign exchange; (2) the firms in the retail industry generally incurred higher total liabilities after adopting IFRS because of securitization, and accounting adjustments in customer loyalty programs are unique for this industry; (3) some entities in the petroleum and natural gas industry experienced a significant reduction in net comprehensive income due to incremental exploration and evaluation expenses allowed under IFRS.

This paper contributes to accounting literature in three ways: (1) extending Gray's (1980) comparability index, I propose a new common sized comparability index that shows the economic significance of the impact related to company's total assets or total revenue, which makes cross-sectional comparison meaningful when taking the firm's size into consideration; (2) following Hung and Subramanyam (2007), this paper presents the first Canadian evidence regarding the value relevance of

transitional adjustments; and (3) the in-depth analysis of randomly selected companies from different industries is the first among the IFRS adoption literature that investigates the impact of IFRS at the industry and firm level.

The theoretical and practical implications of this study include: (1) the new common sized comparability index improves the measure of changes from adopting a new accounting standard and provides a more accurate picture about the impact of IFRS adoption on financial statement accounts when studying companies in different sizes; (2) because the results from this paper show the direct impact of IFRS adoption without any confounding effects, it will benefit standard setters, researchers and practitioners when they review changes to accounting standards, conduct future studies on the effect of IFRS and interpret the results reported under different accounting standards.

The rest of this paper is organized as follows. In section 2, I provide a literature review and propose a new comparability index. In section 3, I present an overview of Canadian firms in 2011. In section 4, I outline the impact of IFRS adoption on financial statements and ratios, the value relevance of transitional adjustments, and the industry effects. In section 5, I summarize the paper and offer future research directions.

2. LITERATURE REVIEW

2.1. Impact of IFRS Adoption on Firm's Financial Statements

Since countries from the European Union mandatorily adopted IFRS in 2005, there have been a few studies exploring changes in financial statements caused by accounting standards.

Using reconciliation statements between IFRS and Finnish Accounting Standards (FAS), Lantto and Sahlstrom (2009) examine the impact of IFRS adoption on key financial ratios using 91 Finnish companies listed on the Helsinki Stock Exchange, and find that IFRS adoption increased income statement profits, debt items and current liabilities, but reduced equity, due to changes in fair value accounting, leases, income tax and financial instruments.

Hellman (2011) uses a sample of the 132 largest Swedish-listed companies adopting IFRS in 2005 to analyze the impact of IFRS on financial statements, and finds that net profit (shareholders' equity) under IFRS was 24.1 (9.1) percent higher than that reported under Swedish GAAP, due mainly to standards not previously included in Swedish GAAP.

On the other hand, Tsalavoutas and Evans (2010) utilize reconciliation reports of 238 Greek listed companies, and find that on average, IFRS adoption increased shareholders' equity and net income, and reduced gearing (i.e., total long-term liabilities/net assets) and liquidity (i.e., current assets/current liabilities). The paper also indicates that a similar number of companies were affected negatively and positively and it was difficult to predict the sign of overall impact.

In line with Tsalavoutas and Evans (2010), Stent, Bradbury and Hooks (2010) investigate the impact of IFRS adoption on the financial statements of 56 companies in New Zealand during 2005 through 2008, and indicate that the effect of adopting IFRS on accounting figures is small for most firms, but large for some entities when taking account the maximum and minimum values. The paper also collects data from reconciliation statements between IFRS and local GAAP, and a sample of 56 firms includes 16 early adopters.

Using a sample of 80 German firms, Hung and Subramanyam (2007) conduct an extensive study regarding the impact of IFRS adoption on items of financial statement and the ability of accounting measures to reflect firm value; and find that the mean and variability of total assets and book value of equity are significantly higher under IFRS than German GAAP (HGB). In addition, this paper shows that book value of equity and income under IFRS are no more value relevant than those under HGB, and that the persistence of income is lower under IFRS than HGB. Because early adopters are included in the sample, this paper uses the two-stage regression procedure suggested by Heckman (1979) to control self-selection bias.

Consistent with Hung and Subramanyam (2007), Gjerde, Knivsflå and Sættem (2008) find little evidence of increased unconditional value-relevance after IFRS adoption, using 145 reconciliation statements based on Norwegian Generally Accepted Accounting Principles (NGAAP). This paper also indicates that for firms with a high degree of intangible assets, IFRS is marginally more value-relevant than NGAAP due to goodwill impairments instead of goodwill amortization.

On the contrary, Barth, Landsman, Young and Zhuang (2014) assess whether the reconciliation adjustments for net income are relevant to investors using 1,201 firms in 15 European countries, and demonstrate that net income adjustments are value relevant for financial and non-financial firms. Using the aggregate net income adjustment and 11 individual standard-based net income adjustments disclosed in the reconciliation statements, this study shows that IAS 39, *Financial Instruments: Recognition and Measurement* is more relevant under IFRS than domestic standards.

In line with Barth et al. (2014), Horton and Serafeim (2010) investigate the market reaction to, and the value-relevance of transitional adjustments made by 297 UK listed companies, and find significant negative abnormal returns for firms reporting negative earnings reconciliation, and that only negative earnings adjustments are value-relevant after IFRS adoption. This study also demonstrates that only the impairment of goodwill and deferred taxes reveal new information for the post-IFRS period.

In Canada, Blanchette, Racicot and Sedzro (2013) is the first study using reconciliation reports for research purposes. Using the 150 largest companies from 10 industries (i.e., 15 firms from each industry), the paper concludes that at the aggregate level, IFRS adoption did not significantly change the means and medians of all accounting figures and ratios, except for net profit/loss. However, the paper also shows that for individual companies, IFRS adoption had a material impact on their financial statements because of changes in fair value accounting for investment property, consolidation and strategic investments, financial instruments, derivatives and hedges.

2.2. Accounting Comparability Index

Similar to Hellman (2011) and Tsalavoutas and Evans (2010), I use Gray's (1980) index of comparability to show the difference between accounting figures reported under IFRS versus CGAAP as follows:

$$\text{IC}_{equity} = 1 - \frac{Equity\ (CGAAP) - Equity\ (IFRS)}{|Equity\ (CGAAP)|}$$

Where:

IC_{equity} = the comparability index for equity. A value larger (less) than 1.0 implies that equity reported under IFRS is higher (lower) than that under CGAAP, and an index value of 1.0 means no difference;

Equity (IFRS) = equity reported under IFRS;

Equity (CGAAP) = equity reported under CGAAP.

In addition, I apply the common size analysis approach to demonstrate the impact of IFRS adoption on financial statements. For shareholders' equity (net comprehensive income) included in the statement of financial position (statement of comprehensive income), I show its change at the transition date (for 2010) by dividing shareholders' equity (net comprehensive income) reported under IFRS by total assets (total revenue) reported under CGAAP. I define the change as "common sized index of comparability" (CSIC) as follows:

$$\text{CSIC}_{equity} = \frac{Equity\ (IFRS) - Equity\ (CGAAP)}{Total\ Assets\ (CGAAP)}$$

Where:

CSIC_{equity} = the common sized index of comparability for equity. A value larger (less) than zero implies that equity reported under IFRS is higher (lower) than that under CGAAP, and an index value of zero means no difference;

Equity (IFRS) = equity reported under IFRS;

Equity (CGAAP) = equity reported under CGAAP;

Total Assets (CGAAP) = total assets reported under CGAAP.

The advantage of this new index is that the impact of IFRS on each account is compared to the company's total assets or total revenue, which shows the economic significance of effects and makes a cross-sectional comparison meaningful.

Common size analysis expresses each line item on a financial statement as a percent of a base amount (i.e., total assets for balance sheet and total revenue for income statement), widely used in accounting practice for comparing multi-year or cross-sectional financial performance. Because companies vary with size, a comparison using the value unadjusted for firm size cannot reveal the true impact of IFRS adoption on economic fundamentals. Using Computer Modelling Group Ltd. as an example, in 2010 the company's deferred tax liability increased $189 thousand at the transition date under IFRS and there was no balance in this account under CGAAP. Using Gray's (1980) method, the comparability index for deferred tax liability is measured at a positive infinite. However, the increase of $189 thousand only represents 0.3% of total assets reported under CGAAP. Using the common sized comparability index, the impact of IFRS adoption on deferred tax liability is measured at 0.3%.

3. IFRS ADOPTION IN CANADA

Starting with all 2,329 Canadian firms in the 2011 fiscal year from Compustat based on country code – incorporation, I eliminate 604 financial services firms (SIC code 6000-6999), 93 firms adopting U.S. GAAP during the sample period, 222 firms adopting IFRS after 2011, 48 firms adopting IFRS before 2011, and 688 firms without at least six years (i.e., 2007 – 2012) of accounting history. These restrictions result in a sample of 674 firms adopting IFRS in 2011 for this study.

[Insert Table 1 about here]

Table 2 shows the industry breakdown of Canadian firms adopting different accounting standards in 2011. I assign the 1,037 firms with at least six years (i.e., 2007 – 2012) of accounting history into 36 industry groups according to the Fama and French 48 industry classification. Within the 36 industry groups, I select 13 industries with at least twenty firms for the analysis in the next section.

Among the 93 firms adopting US GAAP, 8 companies were from the utilities industry and a tendency to adopt US GAAP rather than IFRS (i.e., 8 out of 29) is much higher for this industry than the overall average (i.e., 93 out of 1,037).

Among the 48 firms adopting IFRS voluntarily before January 1, 2011, 75% (i.e., 36 out of 48) of them were from non-metallic mining, petroleum and natural gas, and precious metals industries, suggesting that resource companies have proportionally high preference for early IFRS adoption.

[Insert Table 2 about here]

4. IMPACT OF IFRS ADOPTION

In this section, I first randomly select one company from the following thirteen industries: business services, construction materials, electronic equipment, machinery, non-metallic mining, petroleum and natural gas, pharmaceutical product, precious metals, retail, telecommunication, transportation, utilities and wholesale. Then I compare the two sets of financial statements reported under CGAAP and IFRS for 2010, using Gray's (1980) comparability index and the newly proposed common sized comparability index.

All numbers are stated in Canadian dollars, except where noted.

4.1. Thirteen Firms from Different Industries

4.1.1. Computer Modelling Group Ltd. — Business Services Industry

Canada is a global leader in business services specializing in management consulting, knowledge process outsourcing, data mining, and infrastructure management and accounting services. In 2013, professional, scientific and technical services contributed $83.5 billion to Canadian GDP and employed 820,307 Canadians (Foreign Affairs, Trade and Development Canada, 2014). According to Statistics Canada's 2012 year book, firms in Alberta accounted for 31.6% of business services revenues, followed by Ontario (27.2%), Quebec (19.7%) and British Columbia (12.9%) (Statistics Canada, 2012).

Computer Modelling Group Ltd. ("CMG") is a computer software company developing and licensing reservoir simulation software serving the oil and gas industry, with sales and technical support services based in Calgary, Houston, London, Caracas and Dubai (Computer Modelling Group Ltd., 2011).

In preparing its financial statements in accordance with IFRS for the first time, CMG applied the following optional exemptions allowed under IFRS 1, *First-time Adoption of International Financial Reporting Standards*: (1) the company elected not to retrospectively apply IFRS 3, *Business Combinations*, resulting in no restatement of business combination prior to its transition date, April 1. 2010; and (2) IFRS 1 provides the exemption from retrospective application of IFRS 2, *Share-base Payments* and CMG only applied IFRS 2 to options granted after November 7, 2002 that had not vested by the transition date.

IFRS adoption made almost no difference to CMG's financial statements: (1) net comprehensive income remained unchanged, and (2) total assets only decreased $33 thousand from $49.9 million reported under CGAAP.

4.1.2. West Fraser Timber Co. Ltd. — Construction Materials Industry

The construction materials industry consists of companies engaged in the extraction of sand, gravel, rock, etc., as well as filtering, bleaching, cutting and other stone-processing operations. This sector has extremely diverse suppliers, from cement manufacturers to paint and wiring producers. In recent years, the demand for green construction materials is expected to grow from USD$116 billion in 2013 to more than USD$254 billion by 2020 (QFinance, 2013).

West Fraser Timber Co. Ltd. ("West Fraser") is a North American wood products company started by three brothers sixty years ago in British Columbia. Its main products are lumber, southern yellow pine, panels, pulp, newsprint and wood chips. Since 2006, North American lumber production has declined by approximately 30% due to the deep recession in the U.S. homebuilding market. In recent years, the company started to explore Asian markets including China and Japan and shipped roughly 30% of its lumber and 60% of its pulp there in 2011. West Fraser was awarded $88 million in Green Transformation Funds from the federal government to promote energy efficiency and the company has fully utilized the funds to improve green energy production at its four pulp mills (West Fraser Timber Co. Ltd., 2011).

Similar to Computer Modelling Group Ltd., West Fraser applied the optional exemptions for business combinations and share-based payments. In addition, the company elected to adopt the following exemptions for: (1) deemed cost of property, plant and equipment. West Fraser chose to revalue certain items of property, plant and equipment that were impaired under IFRS at the transition date (i.e., January 1, 2010); (2) employee benefits under IAS 19, *Employee Benefits*. The company reset the cumulative unamortized actuarial gains and losses from its employee benefit plans to zero and recognized them in the opening retained earnings account; (3) foreign exchange under IAS 21, *The Effects of Changes in Foreign Exchange Rates*. The company elected to reset the cumulative translation balance to zero on January 1, 2010; (4) decommissioning liabilities under IFRIC 1, *Changes in Existing Decommissioning, Restoration and Similar Liabilities*. West Fraser applied the exemption to its decommissioning liabilities included in the cost of property, plant and equipment.

After adopting IFRS, West Fraser's retained earnings on January 1, 2010 decreased by $255.0 million (i.e., 9.1% of $2,813.1 million total assets under CGAAP) and net earnings dropped by $36.2 million (i.e., 1.3% of $2,886 million total revenue under CGAAP) for the year ended December 31, 2010 mainly due to changes in accounting policies regarding (1) employee benefits, (2) impairment, and (3) deferred income taxes.

4.1.3. Norsat International Inc. — Electronic Equipment Industry

The electronic equipment, instruments and components industry in the information technology sector emerged in the 20th century and has now become a global industry producing devices such as computers, antennas and transistors. This industry spends a greater percentage of sales on R&D than any other sector because of highly competitive markets and short product life cycles. As high-tech providers, companies in this industry rely heavily on patents, trademarks, copyrights, licenses and ongoing training of their employees for business success. Increasing environmental awareness of electronic waste has led to a call for eliminating toxic materials and reducing energy consumption in this industry.

Norsat International Inc. ("Norsat") is a leading provider of communication solutions for users that require reliable transmission of data, audio and video in remote and austere regions of the world. The company mainly specializes in RF antennas, filters ("Sinclair Technologies"), satellite solutions and microware products, widely used by government agencies, militaries and news organizations. Norsat has four wholly owned subsidiaries as follows: Norsat International (America), Inc., Norsat International (United Kingdom) Ltd., Norsat S.A. and Sinclair Technologies Holdings Inc. (Norsat International Inc., 2011).

As a first-time adopter, Norsat elected the optional exemptions for business combinations, foreign exchange and share-based payments. IFRS adoption led to the following major changes in accounting policies for the company: (1) foreign exchange. Because the company elected to eliminate the cumulative translation difference of USD$399.5 thousand, its other comprehensive income reduced by the same amount at the transition date; (2) deferred income tax assets/liabilities. The company has reclassified current deferred income tax assets and liabilities to non-current items; (3) provisions. Norsat has reclassified its warranty provisions from accrued liabilities to provisions.

Norsat's total assets and total shareholders' equity did not change on January 1, 2010 (i.e., the transition date) and December 31, 2010. Its comprehensive income slightly decreased by USD$6,551 for the year ended December 31, 2010 from USD$2,146.7 thousand under CGAAP.

4.1.4. Hyduke Energy Services Inc. — Machinery Industry

Canada is one of the world's top machinery-manufacturing countries. With over 9,000 establishments and more than 170,000 workers, this industry generates nearly $45 billion in revenue and exports more than 60 percent of all sales (Canadian Trade Commissioner, 2014). The machinery sector in Canada is highly diversified, labour- and technology- intensive, and specializes in metalworking machinery manufacturing, mining, oil and gas field machinery manufacturing, construction machinery manufacturing, environmental systems and agricultural machinery manufacturing, and general-purpose machinery manufacturing.

Hyduke Energy Services Inc. ("Hyduke") is an integrated oilfield company that manufactures, repairs and distributes oilfield equipment and supplies in Canada and worldwide. The company has eight wholly-owned subsidiaries in four segments: manufacturing, distribution, truck mounted equipment and other services. Because the Western Canadian market is highly competitive, Hyduke started to serve foreign customers six years ago and has sold equipment to the Russian Federation, Cuba, Peru, Columbia, etc. The company also developed a balanced products/services business strategy to engage in service, repair and consumables activities in order to overcome the high fluctuation in new capital equipment investment due to the cyclical nature of the oil and gas services industry (Hyduke Energy Services Inc., 2011).

As a first-time IFRS adopter, Hyduke has elected to apply the exemptions for business combinations and share-based payments. For property, plant and equipment, the company chose to only revalue land at fair value on January 1, 2010 (i.e., the transition day) and use historical costs for any other fixed assets. For leases, Hyduke elected not to reassess any lease arrangements under the exemption from retrospective application of IFRIC 4, *Determining Whether an Arrangement Contains a Lease*.

Adopting IFRS increased the company's total equity by $3.0 million on January 1, 2010 and made almost no difference to its comprehensive income, because of the following adjustments in: (1) fair value of land as deemed cost, (2) derecognition of intangible assets, and (3) deferred tax.

4.1.5. Nautilus Minerals Inc. — Non-Metallic Mining Industry

The non-metallic mining industry comprises establishments engaged in mining or quarrying non-metallic minerals such as potash, diamonds, cement, ceramics, glass and lime, except coal. This sector is one of the key contributors to Canada's economy, and non-metallic minerals production was valued at over $15.8 billion in 2013 (Natural Resources Canada, 2014). In recent years, increasing environmental awareness has forced the mining industry to reduce greenhouse gas emissions, waste rock and mine tailings and energy consumption.

Nautilus Minerals Inc. ("Nautilus") is the first seafloor resource exploration company to commercially explore the ocean floor for copper, gold, silver and zinc deposits. Up to December 31, 2011, the company was still in the exploration stage and had not earned significant revenue. The mining lease of Nautilus' first development, the Solwara 1 Project, has been granted by the State of Papua New Guinea (PNG) for an initial 20 year term. In 2011, the company formed a joint venture with the State of PNG and a strategic partnership with German shipping company Harren & Partner (Nautilus Minerals Inc., 2011).

In 2011, Nautilus prepared its financial statements in accordance with IFRS for the first time. Similar to Hyduke, the company elected the exemptions for business combinations and share-based payments. IFRS adoption made no difference to the company's total assets on January 1, 2010 and reduced its comprehensive loss by USD$2.0 million from USD$45.0 million under CGAAP due to the accounting policy change in share-based payments.

4.1.6. Precision Drilling Corporation — Petroleum and Natural Gas Industry

The petroleum and natural gas sector finds, produces, processes, transports, refines and markets petroleum commodities including oil, natural gas, coal bed methane and coal. The ongoing development of the oil sands has significantly boosted Canada's oil and gas industry over the past few years. In 2013, Western Canadian crude oil production increased 6.5 percent over 2012 and averaged 3.3 million barrels per day, and the prices received for Canadian oil in export markets reached $87.45 per barrel (National Energy Board, 2014). However, the recent sharp drop of oil prices (e.g., $49.28 per barrel on February 24, 2015) has put the future of this industry in question and many oil and gas companies plan to cut back on capital spending and reduce hiring in 2015 (Mercer, 2015).

Precision Drilling Corporation ("Precision") is a Canadian provider of drilling rigs, drilling services, well service and snubbing rigs, coiled tubing services, camps, rental equipment, and water treatment units to the oil and gas industry (Precision Drilling Corporation, 2011).

As permitted under IFRS 1, Precision has elected not to apply the exemption for IFRS 3, *Business Combinations*, and to restate the acquisitions occurring on or after December 23, 2008. However, the company applied the exemptions for (1) foreign exchange, and (2) borrowing costs. IAS 23, *Borrowing Costs*, requires an entity to capitalize the borrowing costs related to all qualifying assets with the effective date on or after January 1, 2009. Precision elected an effective date of January 1, 2010 (i.e., the transition date). In addition, the company chose to revalue selected drilling rigs located in the United States and Canada in accordance with IFRS 1.

IFRS adoption led to a decrease of $736.8 million in total assets, representing 17.6% of $4,191.7 million total assets under CGAAP on January 1, 2010 and a reduction of $18.6 million in net comprehensive income, accounting for 1.3% of $1,429.7 million in total revenue under CGAAP for the year ended December 31, 2010. The following changes in accounting policies contributed to the impact of IFRS adoption: (1) re-valuation of certain items of property, plant and equipment; (2) re-valuation of business combinations; and (3) recalculation of income taxes.

4.1.7. Aeterna Zentaris Inc. — Pharmaceutical Product Industry

The pharmaceutical sector is one of the most R&D intensive industries in Canada, composed of brand-name pharmaceuticals and generic drug companies, biopharmaceutical small and medium sized enterprise and contract service providers. A generic drug may require $3 to $10 million of R&D to develop, and full costing (including amortization of research failures and opportunity cost of capital) raises average R&D costs per drug significantly (Industry Canada, 2014).

The brand subsector in this industry has experienced a revenue loss due to genericization in recent years and the value of patent losses has remained above $1 billion each year since 2007 (Industry Canada, 2013). In 2011, the group of the 10 leading brand corporations, including Pfizer, Apotex, AstraZeneca, Johnson & Johnson, Teva, Merck, Novartis, GlaxoSmithKline, Abbott and Roche, posted negative growth of 1%, and the Canadian market share shrank to 60% from 65% in 2007.

Aeterna Zentaris Inc. ("AZ") is a late-stage global biopharmaceutical company specializing in oncology and endocrine therapy. The company has completed Phase 3 trials with perifosine in colorectal cancer, Phase 2 trials in advanced ovarian cancer and other early-stage programs in oncology. AZ's common shares are listed on the Toronto Stock Exchange and the NASDAQ, with three wholly-owned direct and indirect subsidiaries located in Germany and the United States (Aeterna Zentaris Inc., 2011).

As a first-time IFRS adopter, AZ elected to apply the exemptions for business combinations and foreign exchange. As a result of IFRS adoption, the company's 2010 net comprehensive loss under IFRS increased by USD$ 4.1 million mainly due to (1) USD$ 6.4 million re-valuation losses in share purchase warrants, reclassified as liabilities from equity under CGAAP and measured at fair value; (2) USD$ 1.0 million gain from foreign currency translation; and (3) USD$ 0.9 million gain from change in impairment of intangible assets.

AZ's shareholders' equity decreased USD$20.1 million on the transition date (i.e., January 1, 2010) primarily because of (1) USD$ 12.9 million impairment charge related to intangible assets; (2) USD$ 4.7

million loss from derecognition of deferred transaction costs; and (3) USD$1.7 million loss from reclassification of share purchase warrants.

4.1.8. Semafo Inc. — Precious Metals Industry

The precious metals sector is very capital intensive and requires heavy investment in building production facilities. Gold is the most popular commodity produced by this industry and its price fluctuates daily depending on demand, inflation and other factors. The value of metallic minerals production in Canada reached $23.2 billion in 2013 (Natural Resources Canada, 2014).

Semafo Inc. ("Semafo") is a Canadian-based gold mining company with operation in three West Africa locations: the Mana Mine in Burkina Faso, the Samira Hill Mine in Niger and the Kiniero Mine in Guinea (Semafo Inc., 2011). Semafo's transition date to IFRS was January 1, 2010 and the company elected to apply the exemptions for business combinations, leases, decommissioning, share-based payments and borrowing costs.

IFRS adoption increased the company's total assets by $7.4 million, representing 2% of $361.8 million reported under CGAAP on January 1, 2010; and boosted its net comprehensive income by $357 thousand from $105.0 million under CGAAP for the year ended December 31, 2010. The effects of IFRS adoption were mainly driven by the accounting policy changes in: (1) investment and other non-current assets, (2) advance payable, and (3) deferred income tax liabilities.

4.1.9. Sears Canada Inc. — Retail Industry

The retail industry that sells consumer goods and related services to the general public is highly competitive in Canada. The recent announcement from Target Canada regarding the closure of its 133 stores in less than two years after launching certainly indicated that the retail landscape in Canada is changing. The shift from in-store purchasing to online shopping has a tremendous impact on this industry and several large retailers including Staples, Best Buy and Sears Canada have experienced a loss in revenue.

Sears Canada Inc. ("Sears Canada") is a national retailer with more than five hundred corporate stores, dealer stores, home improvement showrooms, travel offices and home maintenance establishments. The immediate parent of Sears Canada is the Sears Holding Corporation in the U.S. located in Delaware (Sears Canada, 2011). In recent years, the company's same store sales have gradually declined, which triggered the closure of several stores and the layoff of more than 3,000 employees.

As a first-time IFRS adopter, Sears Canada elected to (1) revalue certain items of its land and building, investment property and finance lease buildings; (2) apply the exemptions for business combinations, borrowing costs, share-based payments and leases; and (3) not recognize all cumulative actuarial gains and losses at the transition date (i.e., January 31, 2010) through opening retained earnings, as allowed under IFRS 1 for employee benefits.

At the transition date, the total assets (retained earnings) reported under IFRS increased $610.9 ($593.9) million from $3,404.8 ($1,633.8) million under CGAAP. For the year ended January 29, 2011, its net comprehensive income under IFRS decreased $34.2 million from $139.4 million under CGAAP. The impact of IFRS adoption is mainly due to: (1) re-valuation of property, plant and equipment, (2) reassessment of investment in joint ventures, and (3) recalculation of income taxes.

4.1.10. TeraGo Inc. — Telecommunication Industry

The telecommunication sector in Canada is regulated by the Canadian Radio-Television and Telecommunications Commission (CRTC). Based on CRTC's monitoring report 2014, telecommunications revenue reached $44.8 billion in 2013 and services were offered to over twelve million households and one million businesses by more than 800 providers in the industry (Canadian Radio-television and Telecommunication Commission, 2014).

TeraGo Inc. ("TeraGo") is a wireless broadband communication services provider to businesses in Canada. Since launching its commercial operations in 2000, the company has experienced rapid growth and its revenue has increased at a compound annual growth rate of 28% from 2002 to 2011. TeraGo's

customers normally sign a long-term contract for services provided by the company, which enables TeraGo to generate stable income. Up to December 31, 2011, the company offered its services to more than 6,000 business locations across Canada and generated $44.9 million revenue in 2011.

In preparing its first IFRS financial statements, TeraGo elected to apply the optional exemptions for business combinations, share-based payments, borrowing costs, and decommissioning and restoration. In addition, the company chose not to revalue its property, plant and equipment (TeraGo Inc., 2011).

Adopting IFRS made no difference to its total assets, and its total equity only slightly increased $22 thousand (i.e., less than 1% of $45.6 million total assets under CGAAP) at the transition date. The company's net comprehensive loss under IFRS reduced by 0.7% or $44 thousand compared to $5,875 thousand reported under CGAAP.

4.1.11. TransForce Inc. — Transportation Industry

The transportation industry is regulated by Transport Canada, and operates in four transportation modes (trucking, rail, air and marine), postal services, couriers and messengers, and warehousing and storage. This sector is a strong economic force in Canada's marketplace, and continuing investment in the country's infrastructure is key to its growth. In the wake of the Lac-Megantic tragedy, transportation safety is becoming a top priority of this industry.

TransForce Inc. ("TransForce") is a North American transportation and logistics company providing package and courier, less-than-truckload, truckload, and specialized services to the energy and other sectors. Over the past few years, the company has significantly boosted its revenue by acquiring several competitors in the industry such as Dynamex, DHL Express Canada and I.E. Miller Services.

Upon IFRS adoption, TransForce elected to apply the exemptions for employee benefits, foreign exchange, and decommissioning and restoration. In addition, the company chose to (1) restate the acquisition that occurred between October 1, 2009 and December 31, 2009 (i.e., the ATS acquisition); and (2) revalue several pieces of land (TransForce Inc., 2011).

After adopting IFRS, TransForce's total assets (retained earnings) increased $49.4 ($14.8) million at the transition date, representing 3.2% (1.0%) of $1,527.3 million total assets reported under CGAAP, and its net comprehensive income decreased $5.5 million for the year ended December 31, 2010, accounting for 0.3% of $1,840.1 million total revenue reported under CGAAP. The following changes occurred on January 1, 2010: (1) revaluing several pieces of land increased the company's fixed assets by $92.5 million, representing 6.6% of its total assets under CGAAP; (2) deferred tax liabilities increased by $20.5 million; and (3) intangible assets reduced by $51.8 million, due to changes in business combinations, foreign exchange and impairment.

4.1.12. Newalta Corporate — Utilities Industry

The utilities sector comprises establishments primarily engaged in generating, transmitting and distributing electricity, providing natural gas, and treating and distributing water. This sector is capital intensive and requires huge investments in lines, pipes and treatment facilities. While rates for electricity and natural gas are regulated by utility commissions at the provincial level, the wholesale power generation segment of the industry is generally deregulated.

Newalta Corporate ("Newalta") is a North American provider of engineered environmental solutions enabling customers to reduce wastes from industrial residues. Its customers operate in oil and gas, petrochemical, refining, lead, manufacturing and mining industries. The company was formed on January 1, 2010 from the sole unitholder of Newalta Income Fund and its wholly-owned operating subsidiary.

As a first-time IFRS adopter, Newalta elected the exemptions for business combinations, share-based payments, leases, decommissioning and restoration, and borrowing costs. In addition, the company chose not to revalue its property, plant and equipment (Newalta Corporate, 2011).

After adopting IFRS, the company's total assets (total equity) increased (decreased) $23.7 ($21.5) million at the transition date, representing 2.4% (2.1%) of $993.7 million total assets reported under CGAAP; and its net comprehensive income decreased by $1.9 million for the year ended December 31,

2010, accounting for 0.3% of $576.2 million total revenue reported under CGAAP. During the transition to IFRS, the following major accounting policy changes occurred in: (1) provision for decommissioning liabilities, (2) deferred tax, and (3) conversion from a trust to corporation on December 31, 2008.

4.1.13. Finning International Inc. — Wholesale Industry

The wholesale sector primarily sells merchandise in large quantities to retailers, businesses and institutional clients, including two main types of companies: wholesale merchants who sell goods on their own accounts, and wholesale agents and brokers that arrange transactions for others for a fee. Sales of capital goods or durable non-consumer goods such as farm machinery and heavy duty trucks are included in this sector as well.

Finning International Inc. ("Finning") sells, rents, and provides parts and service for equipment (e.g., Caterpillar) and engines to customers in various industries such as mining, construction, power systems, petroleum, and forestry (Finning International Inc., 2011).

In preparing IFRS-based financial statements for the first time, Finning elected to apply the exemptions for employee benefits, share-based payments, borrowing costs, business combinations and foreign exchange. The company also chose not to revalue its property, plant and equipment.

After adopting IFRS, Finning's total assets (retailed earnings) decreased $245.2 ($514.2) million at the transition date, representing 6.7% (14.0%) of $3,671.4 million total assets reported under CGAAP. Its revenue (net comprehensive income) decreased (increased) $56.7 ($134.4) million for the year ended December 31, 2010, accounting for 2.2% (2.9%) of $3,464.3 million total revenue reported under CGAAP. The effects of IFRS adoption on the company's financial statements are due mainly to accounting policy changes in: (1) employee benefits, (2) share-based payments, and (3) leases.

4.2. Observations from the Thirteen Companies

Table 3 provides a summary of the optional exemptions applied by the thirteen companies during the transition to IFRS. Among the eight exemptions (i.e., business combinations, share-based payments, leases, foreign exchange, borrowing costs, deemed cost of property, plant and equipment, employee benefits, decommission and restoration), deemed cost of property, plant and equipment is the one causing the most discrepancy among first-time IFRS adopters. Some companies chose not to revalue their fixed assets and others elected to revalue some items of their fixed assets such as land. Other exemptions like share-based payments and foreign exchange were generally applied once they were applicable to company circumstances.

[Insert Table 3 about here]

Table 4 shows the impact of IFRS adoption on the thirteen companies' financial statements using the newly proposed common sized comparability index. The percentage changes in the statement of financial position (statement of comprehensive income) at the transition date (for 2010) are calculated using total assets (total revenue) reported under CGAAP at the transition date (for 2010) as a denominator.
For total assets, 5 (5) out of 13 companies incurred an increase (decrease) from 20.5% to less than 1%.
For retained earnings, 7 (5) out of 13 companies underwent a boost (decline) from 21.8% to less than 1%.
For total equity, 6 (5) out of 13 companies exposed to a raise (drop) from 23.3% to less than 1%.
For net comprehensive income, 5 (7) out of 13 companies experienced an improvement (deterioration) in this category. The rest of the companies incurred no change in those accounts. For revenue, 10 out of 13 companies kept the account intact. The findings from Table 4 show that (1) revenue was generally not affected by IFRS adoption; (2) there are no clear patterns for total assets, retained earnings, total equity and net comprehensive income in terms of the direction of changes.

[Insert Table 4 about here]

Table 5 shows the impact of IFRS adoption on the financial statements of thirteen companies using Gray's (1980) comparability index. By changing the denominator from the company's total assets or total revenue to individual accounts (i.e., current assets), the magnitude of effect changes significantly.

[Insert Table 5 about here]

4.3. More Firms from Different Industries

Further to the observations from the thirteen companies, I extend the sample size by randomly selecting additional four companies from the thirteen industries to examine the impact of IFRS adoption on financial statements and key financial ratios.

I first sort all the companies adopting IFRS in 2011 by industry group, then use the random number generator function in Excel to select four additional companies from each industry. For those 65 firms in the sample, I download their 2010 and 2011 financial statements from www.sedar.com (i.e., the official site that provides access to most public securities documents filed by Canadian companies), then hand-collect the financial data reported under CGAAP (IFRS) from the 2010 (2011) financial statements. For descriptive statistics, I winsorize all financial variables at the top and bottom 5 percent to mitigate the effect of outliers on the results. The reason for 5% rather than 1% winsorization rate is that there are generally 3 outliers at the top and/or bottom for each variable. For the 65 firms, if 1% winsorization rate is applied, which means that only one outlier on each side can be adjusted, it will result in findings that are highly driven by outliers.

4.3.1. Descriptive Statistics: Impact of IFRS Adoption on Financial Statements

Table 6 presents the impact of IFRS adoption on financial statements. Using the common sized comparability index, Table 6 shows that the means of current assets, total assets, retained earnings, shareholders' equity, revenue, other comprehensive income and net comprehensive income have decreased after Canadian companies adopted IFRS in 2011, and that the means of current liability, total

liability, income from continuing operations before income taxes and income taxes have slightly increased under IFRS.

[Insert Table 6 about here]

Table 7 reports the sign and significance of the changes. Based on the results from the *t*-statistic test, the changes in current assets, total assets, retained earnings, shareholders' equity, revenue, income taxes and other comprehensive income are significant. Total assets under IFRS decreased 1.6% compared to that reported under CGAAP and shareholders' equity under IFRS decreased 1.7% with respect to total assets reported under CGAAP.

[Insert Table 7 about here]

4.3.2. Descriptive Statistics: Impact of IFRS Adoption on Key Financial Ratios

Table 8 compares return on assets (*ROA*), return on equity (*ROE*), profit margin (*PM*), asset turnover (*ATO*), current ratio, debt to equity ratio and effective tax rate reported under CGAAP versus IFRS (see Appendix A for notation). The means and medians of *ROA, ROE, PM,* and *ATO* (effective tax rate) have decreased (increased) upon mandatory IFRS adoption in Canada.

[Insert Table 8 about here]

Table 9 uses Wilcoxon signed-rank test for equality of matched pairs. Except for current ratio, other financial ratios have a similar number of companies affected negatively and positively and the changes of those ratios are not significant.

To reconcile the findings from Table 7 and 9, I draw attention to the difference between financial statement accounts and key ratios. While shareholders' equity and net comprehensive income both decrease or increase, the direction of change in *ROE* is unpredictable. It explains why several financial statement accounts significantly decreased under IFRS in Table 7 and key ratios have no clear pattern of change in Table 9.

[Insert Table 9 about here]

4.3.3. Value Relevance of Transitional Adjustments

Similar to Hung and Subramanyam (2007), I investigate whether transitional adjustments under IFRS are value relevant using the following model (all variables below are scaled by total assets reported under CGAAP):

$$P = \gamma_0 + \gamma_1 BV\_CGAAP + \gamma_2 BV\_DIF + \gamma_3 NI\_CGAAP + \gamma_2 NI\_DIF + e$$

Where:

P = the market value of equity at the end of 2010 fiscal year;

BV_CGAAP = the book value of equity under CGAAP at the end of 2010 fiscal year;

BV_DIF = the difference in book value of equity under IFRS vs. CGAAP at the end of 2010 fiscal year;

NI_CGAAP = income from continuing operations before income taxes under CGAAP in year 2010;

NI_DIF = the difference in income from continuing operations before income taxes under IFRS vs. CGAAP in year 2010;

e = the error term.

After removing 19 observations with negative operating income, Table 10 shows that the coefficient on operating income adjustments (i.e., *NI-DIF*) is significant at $p < 0.01$ (two-tailed), which suggests that the adjustments related to the income accounts during the transition to IFRS are value relevant. The insignificant and negative coefficient on book value adjustments (i.e., *BV_DIF*) indicates that investors foresee the low quality of accounting adjustments related to shareholders' equity account and react negatively to those changes. Consistent with prior research, the adjusted R^2 in Table 10 is high at 84.9%, similar to 79% in Table 5 of Barth et al. (2014).

This study finds an insignificant relationship between market value of equity and book value of equity reported under local GAAP, which is not consistent with some prior studies (e.g., Hung and

Subramanyam , 2007). One of the potential explanations is that this study has a relatively small sample size and might not fully capture the relation between the two variables.

[Insert Table 10 about here]

4.3.4. Industry Effects

The purpose of this subsection is to further explore whether industry profile plays a role during the transition to IFRS. First, I show the impact of IFRS adoption on industry groups in terms of accounting standards using the sample of 65 companies. Table 11 indicates that (1) the adjustments related to property, plant and equipment are most likely (i.e., 5 out of 5 in each industry) to occur in the petroleum and natural gas, transportation and utilities industries; (2) IAS 21 *The Effects of Change in Foreign Exchange Rates*, IAS 12 *Income Taxes*, IFRS 2 *Share-based Payments* are the accounting standards leading the most transitional adjustments across industry sectors (i.e., 13 out of 13 industries).

[Insert Table 11 about here]

Table 12 shows the impact of IFRS adoption on the financial statements of firms from the thirteen industries. Consistent with the findings from Table 6 at the aggregate level, current assets, total assets, retained earnings, shareholders' equity, revenue, and net comprehensive income generally decreased (i.e., at least 9 out of 13 industries) at the industry level after IFRS adoption, which means that the results at the aggregate level are not driven by the imbalance among industry sectors and reflect the effect of IFRS adoption in general.

[Insert Table 12 about here]

Second, I further randomly select 15 companies from the petroleum and natural gas, machinery and retail industries to examine the industry effects using larger sample size in the three industries, which represents the key contributors to the Canadian economy. Due to data limitation in the machinery industry, the final sample comprises 41 companies.

Table 13 shows the number of transitional adjustments made by companies in the three industries. The observations from Table 13 include: (1) the companies in the machinery industry are more likely to incur the adjustments related to foreign exchange because of subsidiary establishment in foreign countries; (2) customer loyalty programs are unique for the retail industry. Under IFRS, companies defer revenue allocated to award credits from customer loyalty programs previously included in revenue and marketing expenses under CGAAP. (3) For the companies in the petroleum and natural gas industry, decommissioning obligation adjustments are most likely to occur. Under CGAAP, decommissioning obligations related to abandoned wells and facilities were discounted at a credit-adjusted risk-free rate (e.g., 8%). However, under IFRS, because the estimated cash flow to retire those assets has been risk-adjusted, the provision was discounted at a pre-tax risk-free rate (e.g., 4%) at transition based on Government of Canada long-term bonds.

[Insert Table 13 about here]

Table 14 documents the impact of IFRS adoption on the financial statements of companies from the three industries. The companies in the machinery industry have a higher tendency to revalue their fixed assets leading to an increase in property, plant and equipment accounts. On the other hand, due to the different treatment for securitization under IFRS, the firms in the retail industry generally incurred higher total liabilities after the transition. For the petroleum and natural gas industry, because companies were allowed to capitalize costs incurred for exploration, development and producing properties under CGAAP and expense the costs of unsuccessful exploration drilling under IFRS, some firms in this industry experienced a significant increase in operating expenses and reduction in net comprehensive income.

[Insert Table 14 about here]

4.3.5. Robustness Tests

4.3.5.1. Descriptive Statistics: Winsorization at 3% Rather Than 5%

The purpose of this subsection is to address the concern of over winsorization of 5% at the top and bottom to see whether the results from Table 6 will significantly change if a smaller winsorization rate at 3%

is applied. Table 15 indicates that the minimum and maximum of several variables increase greatly after using 3% winsorization rate (e.g., from 15.3% to 36.1% for the maximum of total liability, from 22.8% to 81.4% for the maximum of income from continuing operations before income taxes, from 5.9% to 45.4% for the maximum of income taxes, from −21.3% to −90.5% for the minimum of revenue). Considering the fact that several extreme values of minimum and maximum still appear in Table 15, it is appropriate to apply 5% winsorization rate at the top and bottom.

[Insert Table 15 about here]

4.3.5.2. Value Relevance: Bootstrapping

In order to see whether the distribution of the 46 firms is normal, which is one of the conditions required by OLS regression in the value relevance analysis, I apply the bootstrapping approach to the analysis in Table 10. What bootstrapping does is to randomly withdraw 1,000 samples from the 46 firms. One firm could appear many times in the 1,000 replications. If the results from the bootstrapping method are similar to those from the original analysis, it means that the 46 firms are normally distributed. Table 16 verifies that the normality condition required by OLS regression has been satisfied. Since there is no new information added after applying the bootstrapping method, the adjusted R^2 is the same as that from Table 10.

[Insert Table 16 about here]

5. CONCLUSION

This paper examines the impact of IFRS adoption on the financial statements of companies from different industries by comparing two sets of financial statements reported under IFRS and CGAAP for year 2010. Through computing Gray's (1980) comparability index commonly used in prior research and newly proposed common sized comparability index, the study shows that the new index makes across-sectional comparison meaningful by reducing the sensitivity of comparability index to firm size.

The results in this paper also show that current assets, total assets, retained earnings, shareholder's equity, revenue and other comprehensive income (income taxes) have significantly reduced (increased) when reported under IFRS, while key financial ratios show no clear direction of change.

In terms of the value relevance of transitional adjustments, this paper indicates that only transitional adjustments related to income accounts are value relevant. For industry effects, the analyses of 65 companies from the thirteen industries and 41 firms from the three industries clearly demonstrate that companies from various industries were affected differently by IFRS adoption as some accounting standards are only applicable to certain industries and firms react inconsistently to same standards across industry sectors.

The limitations of this paper include: (1) the sample size of 65 companies is relatively small and the findings from this study might not capture the impact of IFRS on Canadian companies as a whole; (2) there are only one year reconciliation statements available for this paper, and it limits the scope of research and any studies required more than one year data are unable to conduct under this unique setting; (3) because the firms from the pre-IFRS period have been in business longer than those from the post-IFRS period, survivorship and/or lifecycle bias might be a concern for this study; (4) since financial service firms have been removed from the sample, the results from this study might not be generalizable to all firms.

Future research is encouraged to utilize the new common sized comparability index to further investigate the effect of adopting IFRS on financial statement accounts at the industry or firm level in order to improve the quality of accounting standards.

Appendix: Notation

ROA (Return on Assets) = Income from continuing operations before income taxes deflated by total assets;

ROE (Return on Equity) = Income from continuing operations before income taxes deflated by shareholders' equity;

PM (Profit Margin) = Income from continuing operations before income taxes / total revenue;

ATO (Assets Turnover) = Total revenue / total assets;

Current Ratio = Current assets / current liabilities;

Debt to Equity Ratio = Total liabilities / shareholders' equity;

Effective Tax Rate = Income taxes / income from continuing operations before income taxes.

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Table 1 **Composition of Canadian Firms in 2011**

All Canadian firms in 2011 from Compustat based on country code – incorporation	2,329
Less:	
Financial services firms (SIC code 6000 – 6999)	604
Firms without at least 6 years (i.e., 2007 – 2012) of accounting history	688
Firms with available data	1,037
Firms adopting US GAAP	93
Firms adopting IFRS before 2011	48
Firms adopting IFRS after 2011	222
Firms adopting IFRS in 2011	674

Table 2 **Industry Breakdown of Canadian Firms in 2011**

	Firms with Available Data	Firms Adopting US GAAP	Firms Adopting IFRS Before 2011	Firms Adopting IFRS After 2011	Firms Adopting IFRS in 2011
Agriculture	3			1	2
Alcoholic Beverage	5			2	3
Apparel	3			3	0
Automobiles and Trucks	7	2	1	1	3
Business Services	60	5		17	38
Business Supplies	8	1		1	6
Chemicals	12	1	1	1	9
Coal	3		1	1	1
Computers	16	2	1	8	5
Construction	8	2	1	1	4
Construction Materials	21	2		1	18
Consumer Goods	2	1			1
Electrical Equipment	8			1	7
Electronic Equipment	28	7		10	11
Entertainment	8	1		2	5
Food Products	15	2		2	11
Healthcare	4			1	3
Machinery	22	2		4	16
Measuring and Control Equipment	5			4	1
Medical Equipment	12	3		3	6
Non-metallic Mining	240	7	12	75	146
Personal Services	5			1	4
Petroleum and Natural Gas	161	11	13	15	122
Pharmaceutical Product	47	8	4	10	25
Precious Metals	142	9	11	33	89
Printing and Publishing	8		1		7
Recreation	4	2			2
Restaurants, Hotels, Motels	8	1		2	5
Retail	32	1		3	28
Rubber and Plastic Products	8			1	7
Steel Works	10	1		1	8
Telecommunication	20	2		6	12
Transportation	24	4		2	18
Utilities	29	8		2	19
Wholesale	25	2	1	5	17
Others	24	6	1	2	15
Total	1,037	93	48	222	674

Table 3 **Optional Exemptions Applied by Thirteen Companies during the Transition to IFRS**

	Computer Modelling	West Fraser	Norsat	Hyduke	Nautilus	Precision	Aeterna Zentaris
	Business Services	Construction Materials	Electronic Equipment	Machinery	Non-Metallic Mining	Petroleum and Natural Gas	Pharmac-eutical Product
Business combinations	Yes	Yes	Yes	Yes	Yes	No	Yes
Share-based payments	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Leases	N/A	N/A	N/A	Yes	N/A	N/A	N/A
Foreign exchange	N/A	Yes	Yes	N/A	N/A	Yes	Yes
Borrowing costs	N/A	N/A	N/A	N/A	N/A	Yes	N/A
Deemed cost of property, plant and equipment	No	Revaluing Selected Items	No	Only Revaluing Land	No	Revaluing Selected Items	No
Employee benefits	N/A	Yes	N/A	N/A	N/A	N/A	N/A
Decommissioning and restoration	N/A	Yes	N/A	N/A	N/A	N/A	N/A

Table 3 (continued)

	Semafo	Sears Canada	TeraGo	TransForce	Newalta	Finning
	Precious Metals	Retail	Telecommunication	Transportation	Utilties	Wholesale
Business combinations	Yes	Yes	Yes	No	Yes	Yes
Share-based payments	Yes	Yes	Yes	N/A	Yes	Yes
Leases	Yes	Yes	N/A	N/A	Yes	N/A
Foreign exchange	N/A	N/A	N/A	Yes	N/A	Yes
Borrowing costs	Yes	Yes	Yes	N/A	Yes	Yes
Deemed cost of property, plant and equipment	No	Revaluing Selected Items	No	Revaluing Selected Items	No	No
Employee benefits	N/A	No	N/A	Yes	N/A	Yes
Decommissioning and restoration	Yes	N/A	Yes	Yes	Yes	N/A

Table 4 **Impact of IFRS Adoption on Financial Statements Using Common Sized Index**

	Computer Modelling	West Fraser	Norsat	Hyduke	Nautilus	Precision	Aeterna Zentaris
	Business Services	Construction Materials	Electronic Equipment	Machinery	Non-Metallic Mining	Petroleum and Natural Gas	Pharmac-eutical Product
Statement of Financial Position at the Transition Date							
Current assets	0.0%	−0.2%	−1.3%	0.0%	0.0%	0.0%	−0.6%
Property, plant and equipment	0.0%	−21.0%	0.0%	9.0%	0.0%	−6.2%	0.0%
Deferred tax assets	0.0%	N/A	1.3%	0.5%	N/A	0.0%	N/A
Other assets	N/A	14.1%	0.0%	−0.1%	0.0%	−11.4%	−19.8%
Total assets	**−0.1%**	**−7.1%**	**0.0%**	**9.4%**	**0.0%**	**−17.6%**	**−20.5%**
Current liabilities	−0.4%	0.7%	−0.01%	−2.1%	0.0%	0.2%	−0.1%
Deferred tax liabilities	0.3%	−1.5%	0.01%	3.7%	N/A	−2.0%	N/A
Other liabilities	0.0%	0.7%	0.0%	0.0%	0.0%	1.9%	2.9%
Total liabilities	**−0.1%**	**−0.2%**	**0.0%**	**1.6%**	**−0.1%**	**0.1%**	**2.8%**
Non-controlling interests	N/A	N/A	N/A	N/A	−0.1%	N/A	N/A
Share capital	0.0%	0.0%	0.0%	0.0%	0.0%	−14.5%	0.4%
Contributed surplus	N/A	N/A	−0.1%	0.0%	1.0%	0.1%	N/A
Accumulated other comprehensive earnings	0.0%	2.1%	−2.1%	0.0%	N/A	7.1%	−14.7%
Other equity	N/A	N/A	N/A	N/A	N/A	N/A	−3.4%
Retained earnings	0.0%	−9.1%	2.2%	7.8%	−1.0%	−10.2%	−5.5%
Shareholders' equity	0.0%	−6.9%	0.0%	7.8%	0.1%	−17.7%	−23.3%
Statement of Comprehensive Income for 2011							
Revenue	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Operating expenses	−0.5%	−0.6%	0.03%	−0.2%	−4.3%*	1.9%	−1.5%
Other incomes	0.5%	0.0%	N/A	0.005%	0.0%	0.0%	10.8%
Other costs	1.0%	0.0%	0.0%	0.2%	N/A	0.0%	31.3%
Income from continuing operations before income taxes	0.0%	0.6%	−0.03%	0.003%	4.3%*	−1.9%	−18.9%
Income taxes	0.0%	0.2%	0.0%	−0.002%	0.0%	−0.7%	0.0%
Earnings from discontinued operations, net of tax	N/A	0.3%	N/A	N/A	N/A	N/A	N/A
Other comprehensive income	0.0%	−2.0%	0.0%	0.0%	0.0%	0.0%	4.1%
Net comprehensive income	**0.0%**	**−1.3%**	**−0.03%**	**0.001%**	**4.3%***	**−1.3%**	**−14.8%**

*This ratio is calculated using total operating expenses reported under CGAAP as a denominator.

Table 4 (continued)

	Semafo	Sears Canada	TeraGo	TransForce	Newalta	Finning
	Precious Metals	Retail	Telecommunication	Transportation	Utilities	Wholesale
Statement of Financial Position at the Transition Date						
Current assets	0.0%	−1.9%	0.0%	−0.2%	0.4%	−2.2%
Property, plant and equipment	0.0%	10.0%	0.0%	6.6%	2.0%	0.1%
Deferred tax assets	N/A	N/A	N/A	0.0%	N/A	0.9%
Other assets	2.0%	9.8%	0.0%	−3.1%	0.0%	−5.5%
Total assets	**2.0%**	**17.9%**	**0.0%**	**3.2%**	**2.4%**	**−6.7%**
Current liabilities	0.0%	0.1%	0.0%	0.2%	0.05%	−0.6%
Deferred tax liabilities	−0.4%	N/A	N/A	1.2%	0.8%	−2.6%
Other liabilities	−0.4%	0.4%	−0.05%	0.9%	3.7%	2.7%
Total liabilities	**−0.8%**	**0.5%**	**−0.05%**	**2.3%**	**4.5%**	**−0.5%**
Non-controlling interests	N/A	N/A	N/A	N/A	N/A	N/A
Share capital	0.0%	0.0%	0.0%	0.0%	−23.9%	0.0%
Contributed surplus	0.0%	N/A	0.02%	0.0%	0.0%	−0.04%
Accumulated other comprehensive earnings	1.8%	−0.02%	N/A	N/A	N/A	7.9%
Other equity	N/A	N/A	N/A	N/A	−0.1%	N/A
Retained earnings	1.1%	17.4%	0.03%	1.0%	21.8%	−14.0%
Shareholders' equity	2.8%	17.4%	0.05%	1.0%	−2.1%	−6.2%
Statement of Comprehensive Income for 2011						
Revenue	0.0%	−0.4%	0.0%	0.01%	0.0%	−1.2%
Operating expenses	0.0%	0.3%	−0.4%	−0.1%	0.2%	−1.3%
Other incomes	0.0%	−0.2%	0.0%	−0.02%	N/A	0.1%
Other costs	0.1%	0.1%	0.1%	0.2%	0.2%	−0.02%
Income from continuing operations before income taxes	−0.05%	−0.9%	0.2%	−0.1%	−0.4%	0.2%
Income taxes	0.5%	−0.2%	0.0%	0.01%	−0.1%	0.02%
Earnings from discontinued operations, net of tax	N/A	N/A	N/A	N/A	N/A	2.7%
Other comprehensive income	0.7%	0.01%	−0.05%	−0.2%	0.0%	0.0%
Net comprehensive income	**0.1%**	**−0.7%**	**0.1%**	**−0.3%**	**−0.3%**	**2.9%**

Table 5 **Impact of IFRS Adoption on Financial Statements Using Gray's (1980) Index**

	Computer Modelling	West Fraser	Norsat	Hyduke	Nautilus	Precision	Aeterna Zentaris
	Business Services	Construction Materials	Electronic Equipment	Machinery	Non-Metallic Mining	Petroleum and Natural Gas	Pharmac-eutical Product
Statement of Financial Position at the Transition Date							
Current assets	100.0%	99.3%	98.5%	100.0%	100.0%	100.0%	98.9%
Property, plant and equipment	100.0%	63.6%	100.0%	133.7%	100.0%	91.1%	100.0%
Deferred tax assets	100.0%	N/A	113.6%	+∞	N/A	100.0%	N/A
Other assets	N/A	181.9%	100.0%	98.0%	100.0%	37.7%	48.0%
Total assets	**99.9%**	**92.9%**	**100.0%**	**109.4%**	**100.0%**	**82.4%**	**79.5%**
Current liabilities	98.9%	103.9%	99.9%	91.0%	100.0%	105.1%	99.6%
Deferred tax liabilities	+∞	80.5%	100.7%	453.0%	N/A	88.2%	N/A
Other liabilities	100.0%	103.9%	100.0%	100.0%	100.0%	110.3%	104.3%
Total liabilities	**99.8%**	**99.7%**	**100.0%**	**105.7%**	**97.5%**	**100.2%**	**103.1%**
Non-controlling interests	N/A	N/A	N/A	N/A	0.0%	N/A	N/A
Share capital	100.0%	100.0%	100.0%	100.0%	100.0%	78.1%	100.8%
Contributed surplus	N/A	N/A	99.7%	100.0%	106.1%	0.0%	N/A
Accumulated other comprehensive earnings	100.0%	200.0%	0.0%	100.0%	N/A	200.0%	0.0%
Other equity	N/A	N/A	N/A	N/A	N/A	N/A	96.5%
Retained earnings	100.0%	76.4%	101.5%	130.0%	98.3%	−298.6%	96.3%
Shareholders' equity	100.0%	87.9%	100.0%	110.8%	100.1%	71.3%	−117.5%
Statement of Comprehensive Income for 2011							
Revenue	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Operating expenses	99.1%	99.3%	100.04%	99.8%	95.7%	102.4%	99.2%
Other incomes	+∞	100.0%	N/A	+∞	100.0%	100.0%	247.4%
Other costs	+∞	103.4%	100.0%	+∞	N/A	100.0%	31,021.4%
Income from continuing operations before income taxes	100.0%	107.0%	99.7%	100.1%	104.4%	48.5%	77.5%
Income taxes	100.0%	106.8%	100.0%	99.9%	100.0%	−15.7%	100.0%
Earnings from discontinued operations, net of tax	N/A	327.8%	N/A	N/A	N/A	N/A	N/A
Other comprehensive income	100.0%	−358.5%	100.0%	+∞	100.0%	100.0%	2,532.7%
Net comprehensive income	**100.0%**	**76.5%**	**99.7%**	**100.04%**	**104.4%**	**70.1%**	**82.3%**

Table 5 (continued)

	Semafo	Sears Canada	TeraGo	TransForce	Newalta	Finning
	Precious Metals	Retail	Telecommunication	Transportation	Utilities	Wholesale
Statement of Financial Position at the Transition Date						
Current assets	100.0%	97.5%	100.0%	99.0%	103.2%	96.2%
Property, plant and equipment	100.0%	155.0%	100.0%	115.0%	102.8%	100.8%
Deferred tax assets	N/A	N/A	N/A	100.0%	N/A	+∞
Other assets	130.4%	213.7%	100.0%	91.7%	100.0%	81.1%
Total assets	**102.0%**	**117.9%**	**100.0%**	**103.2%**	**102.4%**	**93.3%**
Current liabilities	100.0%	100.4%	100.0%	100.5%	100.5%	97.5%
Deferred tax liabilities	77.1%	N/A	N/A	126.8%	119.6%	13.9%
Other liabilities	94.8%	103.5%	97.2%	104.1%	111.5%	108.9%
Total liabilities	**96.8%**	**101.0%**	**99.7%**	**103.5%**	**109.9%**	**99.1%**
Non-controlling interests	N/A	N/A	N/A	N/A	N/A	N/A
Share capital	100.0%	100.0%	100.0%	100.0%	57.1%	100.0%
Contributed surplus	100.0%	N/A	100.04%	100.0%	100.0%	95.7%
Accumulated other comprehensive earnings	+∞	90.0%	N/A	N/A	N/A	198.4%
Other equity	N/A	N/A	N/A	N/A	55.2%	N/A
Retained earnings	106.2%	136.4%	100.02%	142.2%	1,419.3%	57.8%
Shareholders' equity	103.8%	135.8%	100.1%	102.8%	96.0%	85.0%
Statement of Comprehensive Income for 2011						
Revenue	100.0%	99.6%	100.0%	100.0%	100.0%	98.8%
Operating expenses	100.0%	100.3%	99.6%	99.7%	100.2%	98.6%
Other incomes	100.0%	45.7%	100.0%	99.2%	N/A	+∞
Other costs	104.8%	123.0%	103.4%	111.1%	104.5%	98.2%
Income from continuing operations before income taxes	99.9%	79.1%	101.1%	98.7%	91.6%	105.3%
Income taxes	107.9%	83.9%	100.0%	100.3%	95.9%	102.2%
Earnings from discontinued operations, net of tax	N/A	N/A	N/A	N/A	N/A	149.8%
Other comprehensive income	+∞	103.8%	89.7%	−∞	100.0%	100.0%
Net comprehensive income	**100.3**	**75.5%**	**100.7%**	**94.8%**	**89.6%**	**271.5%**

Table 6 **Descriptive Statistics**

(Common Sized Comparability Index)

Variables	**Mean**	**Standard Deviation**	**Minimum**	**25%**	**Median**	**75%**	**Maximum**
Current Assets	−0.3%	1.1%	−2.6%	−0.7%	−0.0%	0%	2.6%
Total Assets	−1.6%	5.0%	−14.8%	−3.4%	−0.5%	0.6%	7.3%
Current Liability	0.3%	1.6%	−1.7%	−0.3%	0%	0.1%	5.9%
Total Liability	0.8%	4.5%	−7.4%	−0.7%	0.2%	1.4%	15.3%
Retained Earnings	−1.8%	6.3%	−14.9%	−4.7%	−1.0%	0.1%	13.4%
Shareholders' Equity	−1.7%	7.7%	−23.3%	−2.9%	−0.7%	0.1%	13.0%
Revenue	−1.6%	5.2%	−21.3%	−0.1%	0%	0%	0.6%
Income from Continuing Operations before Income Taxes	1.3%	8.9%	−18.9%	−0.4%	0.0%	0.5%	22.8%
Income Taxes	0.5%	1.7%	−1.0%	−0.1%	0%	0.0%	5.9%
Other Comprehensive Income	−0.2%	0.6%	−2.2%	0%	0%	0%	0.4%
Net Comprehensive Income	−2.2%	12.9%	−45.4%	−1.0%	−0.1%	0.7%	15.0%

Table 7 **Sign of Changes and Statistical Tests on Financial Statements**

(Common Sized Comparability Index)

	Sign of Changes			**Statistical Tests**	
	Positive	Negative	No Change	*t* statistic	*p*-value (two-tailed)
Current Assets	9	33	23	−2.263	0.027**
Total Assets	20	36	9	−2.614	0.011**
Current Liability	23	23	19	1.352	0.181
Total Liability	34	24	7	1.461	0.149
Retained Earnings	20	41	4	−2.319	0.024**
Shareholders' Equity	21	40	4	−1.795	0.077*
Revenue	7	18	40	−2.512	0.015**
Income from Continuing Operations before Income Taxes	32	27	6	1.222	0.226
Income Taxes	25	23	17	2.465	0.016**
Other Comprehensive Income	6	16	43	−2.440	0.017**
Net Comprehensive Income	25	37	3	−1.351	0.182

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

Table 8 **Descriptive Statistics**

(Key Financial Ratios)

	Mean	**Standard Deviation**	**Minimum**	**25%**	**Median**	**75%**	**Maximum**
Under CGAAP							
ROA	0.030	0.124	−0.274	−0.024	0.056	0.110	0.208
ROE	0.074	0.256	−0.637	−0.036	0.123	0.212	0.500
PM	0.030	0.124	−0.274	−0.024	0.056	0.110	0.208
ATO	0.970	0.864	0	0.341	0.817	1.264	3.409
Current Ratio	3.100	3.150	0.441	1.293	1.881	3.013	12.571
Debt to Equity Ratio	0.965	0.877	0.076	0.312	0.623	1.374	3.066
Effective Tax Rate	0.185	0.148	0	0	0.242	0.304	0.424
Under IFRS							
ROA	0.020	0.143	−0.415	−0.013	0.052	0.101	0.208
ROE	0.064	0.283	−0.812	−0.023	0.105	0.205	0.492
PM	0.020	0.143	−0.415	−0.013	0.052	0.101	0.208
ATO	0.946	0.845	0	0.404	0.803	1.230	3.311
Current Ratio	2.835	2.514	0.435	1.200	1.881	3.203	9.356
Debt to Equity Ratio	0.920	0.820	0.024	0.207	0.638	1.412	2.650
Effective Tax Rate	0.191	0.135	0	0.018	0.246	0.306	0.363

Table 9 **Wilcoxon Signed-Rank Tests on Key Financial Ratios**

	Sign of Changes			**Statistical Tests**	
	Positive	Negative	No Change	Z statistic	*p*-value (two-tailed)
ROA	33	32	0	0.239	0.812
ROE	33	32	0	−0.265	0.792
PM	33	32	0	0.239	0.812
ATO	25	30	10	−0.845	0.398
Current Ratio	17	36	12	−2.751	0.006***
Debt to Equity Ratio	34	29	2	−0.131	0.896
Effective Tax Rate	26	23	16	0.688	0.491

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

Table 10 **Value Relevance of Transitional Adjustments**

	Predicted Sign	*P*
Intercept		−0.579** (−2.45)
BV_CGAAP	+	0.411 (0.86)
BV_DIF	+	−0.011 (−0.02)
NI_CGAAP	+	15.889*** (14.48)
NI_DIF	+	7.314*** (3.38)
Adjusted R^2		84.9%
# of Observations		46

t-statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Model:

$$P = \gamma_0 + \gamma_1 BV\_CGAAP + \gamma_2 BV\_DIF + \gamma_3 NI\_CGAAP + \gamma_4 NI\_DIF + e$$

Table 11 **Transitional Adjustments Made by the Firms from Thirteen Industries**

(# of Adjustments)

	Business Services	Construction Materials	Electronic Equipment	Machinery	Non-Metallic Mining	Petroleum and Natural Gas	Pharmac-eutical Product
Borrowing costs						2	
Business combination	3		2	3		1	1
Customer loyalty program							
Decommissioning obligations		1			1	3	
Employee benefits		4	2	1			1
Financial instruments	1	1			1		
Foreign exchange	3	4	4	2	1	2	1
Income taxes	4	5	4	3	3	3	2
Impairment	2			1	2	2	1
Lease	2					1	
Property, plant and equipment	4	4	1	3	2	5	
Share-based payments	2	3	3	3	2	5	3

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Table 11 (continued)

	Precious Metals	Retail	Telecommunication	Transportation	Utilities	Wholesale
Borrowing costs		2	1		2	1
Business combination		2		2	2	
Customer loyalty program		3	1			
Decommissioning obligations			1		2	
Employee benefits		4	4	2	2	3
Financial instruments	2	3	1	2	1	
Foreign exchange	3	2	2	2	2	1
Income taxes	2	2	4	5	3	3
Impairment		3	3	3	2	1
Lease		4	1	1	2	4
Property, plant and equipment	1	4	2	5	5	2
Share-based payments	1	3	4	2	2	2

Table 12 **Impact of IFRS Adoption on the Financial Statements of Firms from Thirteen Industries**

(Common Sized Comparability Index)

	Business Services	Construction Materials	Electronic Equipment	Machinery	Non-Metallic Mining	Petroleum and Natural Gas	Pharma-ceutical Product
Statement of Financial Position at the Transition Date							
Current assets	−0.23%	−1.07%	−0.51%	−0.33%	−0.01%	−0.01%	−0.68%
Property, plant and equipment	−0.71%	−3.69%	0.71%	0.61%	−0.53%	−5.22%	0.00%
Total assets	**−0.77%**	**−4.27%**	**−0.54%**	**0.36%**	**−3.70%**	**−3.05%**	**−3.84%**
Current liabilities	1.62%	−0.20%	−0.06%	−1.11%	0.33%	0.06%	0.37%
Deferred tax liabilities	0.66%	−0.41%	0.01%	0.54%	−2.22%	−0.39%	−0.34%
Total liabilities	**−0.24%**	**−0.85%**	**0.45%**	**0.06%**	**2.98%**	**0.87%**	**1.44%**
Retained earnings	−1.47%	−2.04%	−1.19%	−5.65%	−5.24%	−4.20%	−0.34%
Shareholders' equity	−0.54%	6.04%	−1.15%	0.30%	−6.67%	−3.92%	−5.29%
Statement of Comprehensive Income for 2011							
Revenue	−0.47%	−1.35%	−18.21%	−6.22%	0.00%	0.00%	0.00%
Income from continuing operations before income taxes	−0.29%	−0.35%	2.22%	−1.93%	4.95%	9.88%	−34.43%
Income taxes	0.59%	−0.39%	−0.06%	−0.03%	35.19%	2.52%	−0.03%
Earnings from continuing operations after income taxes	−0.87%	0.05%	0.12%	−1.90%	−30.25%	7.26%	−34.40%
Other comprehensive income	0.00%	−0.45%	−1.24%	0.00%	−0.12%	0.41%	0.67%
Net comprehensive income	**−0.87%**	**−0.11%**	**−0.04%**	**−1.91%**	**−21.33%**	**7.67%**	**−33.73%**

(continued on next page)

Table 12 (continued)

	Precious Metals	Retail	Telecommunication	Transportation	Utilities	Wholesale
Statement of Financial Position at the Transition Date						
Current assets	−0.01%	3.13%	−0.06%	−3.10%	−0.07%	−0.95%
Property, plant and equipment	2.16%	−0.12%	−0.15%	−2.09%	0.80%	−0.23%
Total assets	**−0.58%**	**4.80%**	**−1.81%**	**−4.33%**	**−1.18%**	**−1.08%**
Current liabilities	0.00%	2.92%	1.21%	−1.30%	0.06%	−0.36%
Deferred tax liabilities	0.00%	−0.32%	−0.73%	−0.36%	−0.35%	−0.64%
Total liabilities	**0.18%**	**2.46%**	**−3.39%**	**8.96%**	**1.44%**	**7.22%**
Retained earnings	−4.12%	0.96%	0.04%	−1.62%	1.52%	−0.70%
Shareholders' equity	−0.76%	2.34%	2.68%	−12.56%	2.13%	−8.30%
Statement of Comprehensive Income for 2011						
Revenue	−19.37%	−0.74%	−0.05%	−4.43%	−0.80%	−0.13%
Income from continuing operations before income taxes	63.24%	0.01%	0.10%	−0.90%	16.40%	−0.54%
Income taxes	3.12%	0.03%	−0.06%	−0.40%	−0.21%	0.01%
Earnings from continuing operations after income taxes	62.93%	0.29%	0.10%	−0.50%	16.61%	−0.55%
Other comprehensive income	−76.62%	0.00%	−0.67%	−0.04%	0.00%	−0.02%
Net comprehensive income	**−10.25%**	**0.15%**	**−0.51%**	**−0.35%**	**16.61%**	**−0.04%**

Table 13 **Transitional Adjustments Made by the Firms from Three Industries**

(# of Adjustments)

	Machinery	Retail	Petroleum and Natural Gas	Three Industries
Borrowing costs	0	2	1	3
Business combination	5	3	1	9
Customer loyalty program	0	5	0	5
Decommissioning obligations	0	0	7	7
Employee benefits	2	8	0	10
Financial instruments	1	9	2	12
Foreign exchange	9	3	5	17
Income taxes	7	8	11	26
Impairment	6	8	7	21
Lease	2	8	4	14
Property, plant and equipment	9	10	5	24
Share-based payments	4	7	12	23

Table 14 **Impact of IFRS Adoption on the Financial Statements of Firms from Three Industries**

(Common Sized Comparability Index)

	Machinery	Retail	Petroleum and Natural Gas	Three Industries
Statement of Financial Position at the Transition Date				
Current assets	−1.57%	1.56%	−0.01%	0.15%
Property, plant and equipment	0.42%	−1.55%	−1.76%	−1.10%
Total assets	**−0.64%**	**0.32%**	**−1.98%**	**−0.35%**
Current liabilities	−1.11%	1.78%	1.21%	0.80%
Deferred tax liabilities	0.01%	0.22%	0.15%	0.14%
Total liabilities	**−0.89%**	**3.35%**	**2.58%**	**1.93%**
Retained earnings	−0.14%	−1.09%	−3.38%	−1.67%
Shareholders' equity	0.54%	−3.41%	−4.89%	−2.89%
Statement of Comprehensive Income for 2011				
Revenue	−0.20%	0.09%	0.00%	−0.02%
Income from continuing operations before income taxes	−0.37%	−0.20%	−1.51%	−0.72%
Income taxes	0.18%	−0.69%	0.59%	0.01%
Earnings from continuing operations after income taxes	−0.53%	0.60%	−0.20%	−0.18%
Other comprehensive income	−0.11%	−0.04%	−0.06%	−0.07%
Net comprehensive income	**−0.64%**	**0.02%**	**−0.76%**	**−0.44%**

Table 15 **Robustness Test for Descriptive Statistics at 3% Winsorization Rate**

(Common Sized Comparability Index)

Variables	**Mean**	**Standard Deviation**	**Minimum**	**25%**	**Median**	**75%**	**Maximum**
Current Assets	−0.1%	2.5%	−5.0%	−0.7%	−0.0%	0%	10.6%
Total Assets	−1.6%	5.6%	−17.6%	−3.4%	−0.5%	0.6%	10.2%
Current Liability	0.3%	2.1%	−3.5%	−0.3%	0%	0.1%	8.9%
Total Liability	1.4%	7.8%	−11.3%	−0.7%	0.2%	1.4%	36.1%
Retained Earnings	−1.9%	7.1%	−20.1%	−4.7%	−1.0%	0.1%	17.4%
Shareholders' Equity	−1.9%	9.6%	−35.5%	−2.9%	−0.7%	0.1%	19.2%
Revenue	−3.9%	16.3%	−90.5%	−0.1%	0%	0%	1.3%
Income from Continuing Operations before Income Taxes	2.9%	17.5%	−32.8%	−0.4%	0.0%	0.5%	81.4%
Income Taxes	1.8%	8.0%	−1.8%	−0.1%	0%	0.0%	45.4%
Other Comprehensive Income	−0.2%	1.1%	−5.2%	0%	0%	0%	2.0%
Net Comprehensive Income	−3.9%	20.2%	−92.5%	−1.0%	−0.1%	0.7%	17.2%

Table 16 **Robustness Test of the Value Relevance of Transitional Adjustments Using Bootstrapping**

P	Observed Coefficient	Bootstrap Standard Error	z	*p*-Value
Intercept	−0.579	0.223	−2.60	0.009***
BV_CGAAP	0.411	0.494	0.83	0.405
BV_DIF	−0.011	0.955	−0.01	0.991
NI_CGAAP	15.889	3.464	4.59	0.000***
NI_DIF	7.314	3.861	1.89	0.058*
Adjusted R^2	84.9%			
# of Replications	1,000			

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

Model:

$$P = \gamma_0 + \gamma_1 BV\_CGAAP + \gamma_2 BV\_DIF + \gamma_3 NI\_CGAAP + \gamma_4 NI\_DIF + e$$

Chapter 5: Summary

In order to answer the call for global convergence towards a single set of generally accepted accounting standards, the AcSB required a mandatory adoption of IFRS by publicly accountable enterprises in 2011.

In this dissertation, using mandatory IFRS adoption in Canada as a setting, I show: (1) in the first essay, the DuPont components are useful in predicting future return on equity and the persistence of return on equity has worsened since Canadian companies adopted IFRS in 2011; (2) in the second essay, tax expense contains more incremental information content about future profitability than estimated taxable income, and tax expense and its information content have not significantly changed during the transition to IFRS and (3) in the third essay, IFRS adoption has significantly reduced (increased) current assets, total assets, retained earnings, shareholders' equity, revenue and other comprehensive income (income taxes) reported on the financial statements of Canadian companies at the aggregate level.

The first two essays mainly focus on earnings forecasts using the DuPont components or tax expense as predictors and the effects of IFRS adoption on return on equity or tax accounts while the third essay provides support for the findings from the other two papers, through a setting without confounding effects. The first (second) essay shows that the return on equity (effective tax rate) has reduced (increased) when reported under IFRS, which is verified by the results from Section 4.3.2. of the third essay.

Future studies focusing on IFRS adoption, earnings forecasts and tax accounts are encouraged to conduct research in the following areas: (1) exploring the impact of IFRS adoption at the firm or industry level; (2) incorporating more predictors in forecasting models after controlling for multicollinearity among independent variables and (3) examining the information content of tax accounts appearing on the balance sheet.