2018

A Study of Long-Lived Asset Impairment Under U.S. GAAP and IFRS Within the U.S. Institutional Environment

Philip K. Hong

Daniel Gyung Paik
University of Richmond, daniel.paik@richmond.edu

Joyce Van Der Laan Smith
University of Richmond, jvanderl@richmond.edu

A STUDY OF LONG-LIVED ASSET IMPAIRMENT UNDER U.S. GAAP AND IFRS WITHIN THE U.S. INSTITUTIONAL ENVIRONMENT

KEEJAE HONG
Belk College of Business
University of North Carolina, Charlotte
khong5@uncc.edu
(704) 687-5394

DANIEL GYUNG PAIK
Robins School of Business
University of Richmond
daniel.paik@richmond.edu
(804) 289-8573

JOYCE VAN DER LAAN SMITH*
Robins School of Business
University of Richmond
jvanderl@richmond.edu
(804) 287-6811

October 2014

*Corresponding author: Robins School of Business, 248 RSB, 28 Westhampton Way, University of Richmond, VA, 23173 Office: (804) 287-6811, Fax: (804) 289-8878, e-mail: jvanderl@richmond.edu.

Date Availability: Data are available from sources identified in the paper.

A STUDY OF LONG-LIVED ASSET IMPAIRMENT UNDER U.S. GAAP AND IFRS WITHIN THE U.S. INSTITUTIONAL ENVIRONMENT

In this paper, we explore whether differences in accounting standards influence reporting behavior within the U.S. institutional environment where both IFRS and U.S. GAAP are used for reporting purposes. To examine this issue, we focus on the accounting for impairment of long-lived assets, an area where significant differences exist between U.S. GAAP and IFRS. We identify all firms listed in the U.S. who have recognized long-lived asset impairment losses during the 2004 to 2012 period. From these firms, we identify firms following IFRS, and then develop a matched sample of U.S. GAAP firms, using a propensity score matching procedure. We examine the relation between impairment loss and unexpectedly high or low earnings in the year of impairment using a two-stage Heckman regression model, controlling for industry, country, year of write-down, and firm-level economic factors. We find that the association between impairment losses and unexpectedly high and low earnings is significantly higher for U.S. GAAP firms as compared to IFRS reporting firms, implying differences in accounting standards influence firm financial reporting. Our findings are robust to alternative measures of country level institutional factors and macro-economic variables, as well as inclusion of asset impairment reversals.

Keywords: Long-lived asset write-downs, asset impairments, IFRS, U.S. GAAP.

I. INTRODUCTION

In recent years the U.S. Securities and Exchange Commission (SEC) has taken major steps towards the acceptance of International Financial Reporting Standards (IFRS). In 2007, the SEC eliminated the requirement for foreign private issuers using IFRS as issued by the International Accounting Standards Board (IASB) to reconcile IFRS financial statements to U.S. GAAP. Thus, investors and financial statement users in the U.S. need to be familiar with the interpretation of both IFRS and U.S. GAAP financial statements. Further, in 2010 the SEC expressed support for the continuing convergence of U.S. GAAP and IFRS (SEC Release No. 33-9109). While the U.S. GAAP and IFRS accounting models are similar in many respects, significant differences remain (SEC Staff Paper - Final Report, 2012) and the effect of these differences on reporting behavior within the U.S. institutional environment is unclear.

Prior cross-national research provides evidence that a weak reporting environment has a stronger influence on firm reporting behavior than do exogenously determined high quality accounting standards (Ball, Robin and Wu 2003; Burgstahler, Hail and Leuz 2006; Daske, Hail, Leuz and Verdi 2008). Within the U.S., pre-2007 research provides evidence that a strong reporting environment may not constrain the earnings management behavior of firms from weak home country reporting regimes (Lang, Raedy and Wilson 2006). While prior research offers insight on the relation between reported earnings and the institutional environment it does not address the effect of differences between high quality accounting standards within a strong reporting environment. Given that foreign private issuers may now report in accordance with IFRS within the U.S. it is important to understand the effect of specific differences between U.S. GAAP and IFRS standards on reporting behavior.

One area of continuing difference is the accounting for impairment of long-lived assets (SEC Staff Paper - Final Report, 2012). In this paper, we examine whether the differences in accounting standards on impairment of long-lived assets, other than goodwill, under U.S. GAAP (ASC 360-10-35) and under IFRS (IAS 36) influence firms' reporting behavior in the U.S. Understanding the effect of the differences in these accounting standards, if any, provides insight to standard-setters and regulators, as well as to financial statement users seeking to understand the influence of accounting standards and the implications of asset write-downs on a firm's reported earnings.

While both U.S. GAAP and IFRS require assumptions and estimates that provide firms' flexibility in determining the amount and timing of the write-down, two significant differences exist between the asset impairment standards that could influence the reporting behavior of firms.[1] The first is the U.S. GAAP recoverability test and the second is the reversal of impairment losses allowed under IFRS but prohibited under U.S. GAAP. Research of long-lived asset impairments, other than goodwill, in the 1990's in the U.S. observed indications of firms recording asset write-downs in periods of unexpectedly low earnings suggesting "big bath" reporting behavior (Riedl 2004). Research has also observed income smoothing and "big bath" reporting behavior in non-U.S. listed firms reporting under IAS 36 in specific country settings (Siggelkow and Zülch 2013; Duh, Lee and Lin 2009).

However, while research suggests that reporting incentives within specific institutional environments are more important to accounting quality than accounting standards (Ball, Robin and Wu 2003; Burgstahler, Hail and Leuz 2006), very little research examines the behavior of firms using IAS 36 in the U.S. institutional setting. Nor has a study compared the reporting of firms under ASC 360-10-35 and IAS 36 within one country's institutional setting.

[1] We discuss other less fundamental differences between the standards such as, impairment indicators and the specifics of the calculation of the amount of the impairment loss, in the Background and Prior Research section.

In order to examine the reporting behavior of firms following the two asset impairment standards, we identify all U.S. listed firms found in *Compustat North America*, which includes U.S. and international firms, who have recognized long-lived asset impairment losses, other than goodwill, during the 2004 to 2012 period. From these firms we develop a matched sample, using propensity scores based on firm specific characteristics and year of write-down, of firms reporting in accordance with U.S. GAAP and firms reporting in accordance with IFRS. We compare these firms' long-lived asset impairment losses, earnings, and other firm characteristics using univariate comparisons. In addition, we use multivariate regression analyses to examine the relation between impairment loss and unexpectedly high or low earnings in the year of impairment, controlling for country, industry, size and year. In order to mitigate any potential selection bias for our IFRS sample, we use the Heckman two-stage specification for our IFRS model. Since the asset impairment amount is related to a decline in recoverability of a firm's assets we also control for economic factors i.e., industry return on assets, firm level sales and operating cash flows.

Our multivariate analysis provides evidence of a significant negative relation between unexpectedly low earnings (prior to write-downs) and write-downs for firms using U.S. GAAP during the 2004 through 2012 period suggesting "big bath" reporting behavior. Further, we also find a significant positive relation between unexpectedly high earnings (prior to write-downs) and write-downs for U.S. GAAP firms during this same period suggesting income-smoothing behavior. A comparison of U.S. GAAP reporting firms and U.S. listed IFRS firms reveals that U.S. GAAP firms have a significantly higher association between write-downs and both unexpectedly low earnings (prior to write-downs) and unexpectedly high earnings (prior to write-downs) as compared to IFRS firms. We include alternative measures for country level institutional factors for the foreign private issuers in our sample with no substantive difference in our findings. Further,

our findings remain robust when we limit our sample to a comparison of foreign private issuers using U.S. GAAP reporting standards to foreign private issuers using IFRS.

The strong regulatory and legal environment within the U.S. incentivizes the appropriate application of accounting standards. Therefore, one interpretation of our findings is that the application of ASC 360-10-35 results in the appearance of earnings management when that is not the intent. An alternative explanation is that the two-step test required for determining an impairment loss under U.S. GAAP allows more discretion in the determination of the timing of impairment losses. This discretion, when coupled with the inability to reverse impairment losses, provide U.S. GAAP firms both the opportunity and the incentive to time the reporting of impairment losses in periods when there is a need to report higher or lower earnings.

We find that the long-lived asset write-down reporting behavior differs between firms applying U.S. GAAP, ASC 360-10-35, and firms applying IFRS, IAS 36, contributing to our understanding of the effect of differences in the reporting of U.S. listed firms under IFRS and U.S. GAAP standards. This evidence implies that accounting standards influence firm reporting behavior within the U.S. institutional setting. Our findings highlight the differences financial statement users may encounter in comparing U.S. GAAP and IFRS earnings for U.S. listed firms with seemingly similar economic conditions and transactions. Further, our evidence implies that differences in accounting standards are reflected in reporting behavior within strong reporting environments contributing to the debate on the desirability of global accounting standards.

Our findings also contribute to the asset impairment literature by extending the findings of Riedl (2004) on firm behavior under U.S. GAAP and extending the IFRS asset impairment research to the U.S. setting. These findings should be of interest to accounting standard-setters and regulators as they evaluate the impact of the standards and work to improve them.

The remainder of the paper proceeds in the following order. Section II provides the background and prior research. Section III describes the institutional setting and presents the hypotheses. Section IV describes the sample and presents the method for our analysis. Section V presents the results and additional tests. We present our conclusions in Section VI.

II. BACKGROUND AND PRIOR RESEARCH

Overview of the U.S. GAAP and IFRS Asset Impairment Standards

Within the U.S., there are separate standards and criteria for the accounting for impairment of long-lived tangible assets (ASC 360-10-35) and indefinite-lived intangible assets, including goodwill (ASC 350). Differences in the nature of the intangible asset, the criteria for determining the impairment loss as well as, a periodic impairment testing requirement for goodwill and other indefinite-lived intangible assets distinguish the accounting for goodwill and other intangible assets from long-lived tangible assets. These distinctive differences between the nature and accounting for indefinite-lived intangible assets and long-lived tangible assets influence the timing of impairment loss recognition (Banker, Basu and Byzalov 2014; Ramanna and Watts 2012; Li, Shroff, Venkataraman, and Zhang 2011; Hayn and Hughes 2006). For example, Banker et al. (2014) provide evidence that short-term economic signals such as sales change and operating cash flow change, have a greater impact on long-lived tangible assets than on indefinite-lived intangible assets. In this study, we examine whether there is a difference in the association between current period income and impairment losses between U.S. GAAP and IFRS. Given our focus on differences in specific standards and the effect on net income we limit our examination to asset write-downs associated with long-lived tangible asset impairments (ASC 360-10-35).

The intent of both ASC 360-10-35 and IAS 36 is to provide a method for recognizing losses when the recoverable amount of a long-lived asset is less than its carrying amount on the financial

statements. To meet this objective the standards are similar in that they require management to use subjective estimates, projections, and assumptions to assess the recoverability of an asset's carrying amount. Both standards require the identification of the level at which assets will be tested for impairment, individually or as an asset group, determination of when to test for impairment, and the recoverable amount, as well as the measurement and recognition of the impairment loss. Regardless of these similarities, differences exist within the specific guidance provided by each standard. For example, IFRS considers changes in market interest rates as an indicator of impairment whereas U.S. GAAP does not. Further, when determining the asset's recoverable amount IFRS provides more specificity on the identification of the discounted cash flows. There are also differences in the sequence of testing for the impairment of asset groups that have associated goodwill. Beyond these guidance differences there are two fundamental differences between the standards that are recognized as being potentially more significant (SEC 2011), the recoverability test used to identify impairment and the reversal of impairment losses.

U.S. GAAP requires a two-step test for determining an impairment loss. The first step is the recoverability test, used to identify a recognizable impairment, which requires companies to compare the carrying amount of a long-lived asset to its undiscounted sum of future cash flows (ASC 360-10-35-17). The FASB decided to use the undiscounted cash flows in this first step for "practical reasons" (SFAS 144 ¶B15). It is important to note that the amount of the impairment loss is not the difference between the carrying value of the asset and the undiscounted future cash flows, this test is used to determine if a recognizable impairment exists. If the asset does not pass the recoverability test, the second step requires measurement of the impairment loss, determined as the difference between the carrying amount and fair value of the asset. The determination of fair

value should be based on quoted market prices and if those are not available then a discounted cash flow approach should be used.

The recoverability test is required in ASC 360-10-35 but disallowed in IFRS. IAS 36 uses a one-step approach for determination of an impairment loss. Under this standard when there is an indication of impairment the amount of the write-down is calculated as the excess of the asset's carrying amount over its recoverable amount. Recoverable amount is defined as the higher of an asset's fair value less costs to sell and its value in use. Discounted future cash flows are used in determining an asset's value in use. An impairment loss is recognized to the extent that the recoverable amount of an asset is less than its carrying amount. In considering the measurement of an asset's recoverable amount the International Accounting Standards Committee (IASC), the predecessor of the IASB, specifically rejected the proposal that the recoverable amount be based on undiscounted cash flows. In rejecting this concept the IASC stated that the objective of the standard is to reflect an investment decision and that "all rational economic transactions take account of the time value of money" (IAS 36 ¶ BCZ13 (a)). The use of undiscounted cash flows in the U.S. GAAP recoverability test provides a higher threshold for recognizing an impairment loss. As such, it may result in a later recognition of losses under U.S. GAAP than under IFRS (PWC 2013). This implies that assets with similar economics may be recognized differently under U.S. GAAP and IFRS.

The second fundamental difference is the ability of a firm to reverse previously recognized impairment losses allowed by IAS 36 but not under U.S. GAAP. Following IAS 36, at the end of each reporting period companies are required to assess whether there is any indication that a previously recognized impairment loss no longer exists or has decreased. If the company determines that there has been an improvement in the asset's recoverable amount then they may

reverse the impairment loss. However, IAS 36 specifies that "an impairment loss recognized in prior periods for an asset other than goodwill shall be reversed if, and only if, there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment loss was recognized" (IAS 36 ¶114). Assuming these requirements are met, the reversal will be immediately recognized as a gain on the income statement in order to offset the loss originally recorded on the income statement for the impairment. Although a company may reverse the impairment loss, the increased carrying amount of the asset must not exceed the carrying amount of the asset had the impairment loss never been recognized. Thus, a company cannot write the asset above its original value under the traditional historical cost model.[2] U.S. GAAP does not allow the restoration of previously recognized impairment losses. Therefore, although a company's assets are subjected to a less strenuous recoverability test under current U.S. GAAP rules, the write-down or impairment loss is permanent and cannot be reversed, even if the fair value of the asset returns to or exceeds its original value.

The fundamental differences between the U.S. GAAP and IFRS asset impairment standards have the potential to influence the write-down behavior of firm managers. In experimental studies, Seybert (2010) finds that the possibility of an asset impairment influences managerial behavior and Trottier (2013) finds that when managers know that an appropriate asset impairment loss can be reversed when economic conditions justify it, they are significantly more likely to record the impairment.

Prior Research

[2] Under IAS 16, a company may select to use either the cost model or the revaluation model as their accounting policy for a class of property, plant and equipment. The requirements, for reversal of impairment losses under the revaluation model, are presented in IAS 36.

In the U.S., prior to 1995 there was no explicit guidance on the accounting for long-term asset impairment. Firms applied the general guidance in Statement of Financial Accounting Standard (SFAS) No. 5 *Accounting for contingencies*. However concerns over the diversity of practice in the timing and measurement of impairment losses led the Financial Accounting Standards Board to issue SFAS 121 *Accounting for the impairment of long-lived assets and for long-lived assets to be disposed of* which provides specific guidance and is the basis for the general provisions found in ASC 360-10-35.[3] SFAS 121 was effective for fiscal years beginning after December 15, 1995. A comprehensive review of the literature examining the effect of write-downs in the pre-SFAS 121 period is provided by Alciatore et al. (1998 and 2000). Given that the change in U.S. GAAP accounting standards may have affected the magnitude, timing, and managerial incentives related to write-down amounts, in this paper we focus on research examining the behavior of firms after the effective date of SFAS 121.

Riedl (2004) compared the association of long-lived asset write-offs with economic factors and firm behavior before and after SFAS 121. Prior to SFAS 121 two types of earnings management behavior had been observed with asset write-downs, income smoothing and "big bath" behavior (Zucca and Campbell 1992). In the context of asset write-downs, income smoothing describes a firm that in its desire to maintain smooth earnings growth records write-downs in periods of unusually high earnings. Alternatively, "big bath" behavior describes a firm that records asset write-downs in a period when it already has lower than expected earnings providing the opportunity for better future earnings. Writing down an asset ensures that depreciation expense will be lower and therefore net income higher in future periods.

[3] SFAS 121 was superseded in 2001 by SFAS 144 to address the accounting for a business segment that is identified as a discontinued operation.

Riedl's (2004) results, based on a sample of 455 write-off observations from the 1992-1998 period, reveal that write-downs under SFAS 121 have a lower association with economic factors and a higher association with "big bath" reporting behavior than pre-SFAS 121 write-downs. Further, Riedl finds that this "big bath" behavior "more likely reflects opportunistic reporting than managers providing information about their firms' performance" (p. 849). This is obviously the opposite effect that the standard is meant to have, yet it is a consistent finding across industry, macro, and firm-specific variables.

Since the time of Riedl's (2004) study there has been a significant increase in the amount of negative special item reporting in the U.S. (Johnson, Lopez, and Sanchez 2011; Fairfield, Kitching, and Tang 2009). Johnson et al. (2011) find that restructuring charges and long-lived asset write-offs are of significant importance to the negative special item category, finding that 39 percent of firms reporting a negative special item from 2001 to 2009 reported one or both of these types of charges. This increase in occurrence of write-offs combined with the increase in the use of IFRS for reporting in the U.S. provides a unique opportunity to explore the effect on reporting behavior of differences between IFRS and U.S. GAAP within a strong institutional environment.

From an international perspective, studies examining the effect of IAS 36 observe the behavior of firms from specific institutional settings (Siggelkow and Zülch 2013; Duh, Lee and Lin 2009; Dai, Deng, and Mao 2007; Loh and Tan 2002). While the results of these studies may not be generalizable to a U.S. setting, we can draw insight from their findings. Dai, Deng, and Mao (2007) examine the behavior of Chinese listed firms after the adoption of the *China Accounting System for Business Enterprises* which aligned Chinese long-lived asset impairment accounting standards with IFRS. They find evidence of "big bath" reporting behavior concluding that the adoption of the revised Chinese accounting system provides "more opportunities of manipulating earnings" (p.

363). Loh and Tan (2002) examine long-lived asset write-down behavior in Singaporean firms that follow accounting standards aligned with IFRS. Across their analyses of firm-specific and macroeconomic factors they consistently find that profitability is related to long-lived asset write-downs suggesting earnings management motives.

Similarly, Siggelkow and Zülch (2013) examining write-off decisions of German-listed companies that report under IFRS, provide evidence indicating income smoothing behavior but not of "big-bath" reporting behavior. Siggelkow and Zülch believe these findings may be a result of the German institutional environment which stresses prudence, creditor protection and minimization of tax payments.

One of the significant ways in which IFRS differs from U.S. GAAP is the ability of firms applying IFRS to reverse an impairment loss when there are internal or external sources of information that indicate that the impairment loss has decreased or no longer exists. Management is required to make this assessment at the end of each reporting period. Trottier (2013) examines the effect of allowing impairment loss reversals when the asset value recovers, as permitted by IAS 36, on Canadian managers' decisions to recognize impairment losses. In the experiment managers were asked to assess the likelihood of a manager recording an indicated, material impairment loss. Her results suggest that the ability to reverse an impairment loss significantly increases the probability that managers will record such a loss.

Duh, Lee and Lin (2009) examine whether Taiwanese listed firms that follow the equivalent of IAS 36 reverse asset write-downs to manage earnings. Using a sample of firms that reversed impairment losses they find that companies use periods of strong financial results to create reserves that can be used to bolster earnings in periods with weak financial results. They also find that this

income smoothing behavior is more prevalent for firms with higher debt ratios suggesting that these firms are managing earnings to avoid violation of debt covenants.

Similar to the concept of asset write-down reversals, but using a different set of criteria, IFRS also allows the upward revaluation of property, plant and equipment to its fair value under the revaluation model (IAS 16). The revaluation model is not allowed under U.S. GAAP. The limited research examining IFRS asset revaluations provide evidence that the motives and effects for revaluations are a function of the institutional setting consistent with the evidence provided in the cross-national asset impairment studies (Barley, Fried, Haddad and Livnat 2007; Missonier-Piera 2007). For example, Gordon and Hsu (2014) provide evidence that while asset write-offs under IFRS are more predictive of future cash flows than those under U.S. GAAP, there are differences in IFRS reporting behavior between firms from strong legal enforcement as compared to low legal enforcement institutional environments.

Overall, prior research examining reporting under IAS 36 and ASC 360-10-35 provides evidence that firms are able to manipulate earnings through asset impairments within specific country settings. Cross-national research also implies that differences in institutional factors influence that behavior. However, whether there are differences in the behavior of firms reporting under the U.S. GAAP and IFRS asset impairment standards within the U.S. institutional setting has not been examined.

III. INSTITUTIONAL SETTING AND HYPOTHESES

Institutional Setting

Cross-national research has found that the institutional setting influences firms' reporting incentives (Leuz et al. 2003; Daske, Hail, Leuz and Verdi 2008; Jeanjean and Stolowy 2008;

Houqe, van Zijl, Dunstan and Karim 2012). This evidence appears consistent with the differential findings on reporting behavior under IAS 36. Gordon and Hsu (2014) provide evidence suggesting that the informativeness of asset write-downs depends on the institutional setting and Siggelkow and Zülch's (2013) evidence of income smoothing reporting behavior is consistent with Germany's institutional setting.

The institutional environment in the U.S. is based on a common law legal system with a large equity market, strong investor protection rights and a strong legal enforcement system (LaPorta et al. 1997 and 1998; Leuz, Nanda and Wysocki 2003). Burgstahler et al. (2006) find that strong legal systems and capital market forces are associated with higher earnings quality suggesting that "the first order effect of capital markets is to increase earnings informativeness" (p. 1013). Further, Ball, Robin and Wu (2003) in an analysis of East Asian countries provide evidence that the market and political forces forming a country's institutional setting have a greater impact on financial reporting quality than do high quality accounting standards.

However, Lang et al. (2006) provide evidence suggesting that the strong regulatory environment in the U.S. does not override the effect of the home country reporting regime. Examining reconciled earnings for U.S. listed foreign firms for the period 1991 – 2002; they find that non-U.S. firms exhibit more earnings management than do U.S. firms. While they did not specifically consider the effect of IFRS reporting they did find that their results held even for foreign firms that reported using U.S. GAAP in their home country. Within the U.S. market we also have evidence implying that the institutional setting is influencing financial reporting. Kim, Li and Li (2012) find that U.S. listed firms reporting in accordance with IFRS without reconciliation to U.S. GAAP have not experienced negative capital market consequences. Taken

together this evidence leaves open the question of whether differences between U.S. GAAP and IFRS are influencing reporting behavior within the U.S. setting.

We consider this question and add to this research by examining the asset impairment reporting behavior of U.S. listed firms using accounting standards with recognized differences, IAS 36 and ASC 360-10-35. Prior to the acceptance within the U.S. of IFRS for foreign private issuers, reconciliations were required between U.S. GAAP and IFRS (20-F reconciliations). Research examining these reconciliations provide evidence of significant differences between reported net income under the two sets of standards during the 2004-2006 period, with long-lived asset impairments being the second most common reconciliation category (Henry, Lin and Yang 2009). Examining a specific difference in accounting standards within the same institutional setting allows us to add to the discussion over the influence of accounting standards and institutional environment on financial reporting.

Hypotheses

We are interested in whether the U.S. GAAP and IFRS long-lived asset impairment standards result in different firm reporting behavior in the U.S. setting. The U.S. is recognized as one of the most shareholder-focused countries in the world with strong investor rights and legal enforcement (Stout, 2012; LaPorta, et al., 1998). Therefore, this setting allows us to examine whether differences in accounting standards influence reporting behavior within a strong institutional environment. Ball et al. (2003) report evidence that the institutional setting has a stronger influence on reporting behavior than high quality accounting standards, exogenously determined, within weak investor protection environments. Leuz et al. (2003) find that investor protection is a more influential determinant of earnings management behavior than accounting rules that are endogenously determined. The U.S. setting is unique in that it provides a strong investor protection

environment in which we may examine the differences between high quality accounting standards, one developed within that environment (U.S. GAAP) and the other exogenously determined (IFRS). The strong institutional environment provides a high level of assurance on the appropriate application of the standards.

As described previously both standards seek to ensure that assets are not reported in financial statements at more than their recoverable amount. However, there are two fundamental differences between the asset impairment standards: the recoverability test required under U.S. GAAP but not allowed under IFRS, and the reversal of impairment losses allowed under IFRS but prohibited under U.S. GAAP. These differences in the standards may result in different reporting behavior by U.S. listed firms. There is evidence that firms within the U.S. institutional environment following U.S. GAAP are able to time the reporting of asset impairments to periods when earnings are unexpectedly low, "big bath" behavior, but no evidence of income smoothing behavior (Riedl 2004). Outside of the U.S., there is evidence of both income smoothing and 'big bath' reporting behavior associated with asset impairments by firms following IFRS (Dai, Deng, and Mao 2007; Duh, Lee and Lin 2009; Siggelkow and Zülch 2013).

However, regardless of the differences in the standards, if the U.S. institutional environment has a stronger influence on firm reporting behavior than accounting standards, then we would expect to see similar reporting behavior between firms following U.S. GAAP and IFRS. To investigate this expectation we examine the asset impairment reporting behavior of U.S. listed firms and test the following hypotheses.

H1: There is no difference in the relation between long-lived asset impairment write-downs and unexpectedly *low* earnings for U.S. GAAP reporting firms and U.S. listed IFRS reporting firms.

H2: There is no difference in the relation between long-lived asset impairment write-downs and unexpectedly *high* earnings for U.S. GAAP reporting firms and U.S. listed IFRS reporting firms.

If we find no difference in reporting behavior, it indicates that the U.S. institutional environment is influencing reporting behavior or that regardless of the differences in the standards, the reporting under the IFRS and U.S. GAAP standards is substantially equal. If however, we find a difference in reporting behavior, ceteris paribus, it indicates that, within a strong institutional environment, differences in accounting standards are influencing reporting behavior.

IV. SAMPLE SELECTION AND METHOD

Sample Selection

To develop the sample for our study, we identify all public companies within *Compustat North America* recording a write-down from 2004 to 2012.[4] We select only firms listed in the U.S. and subject to U.S. financial reporting requirements. Prior to 2007, foreign private issuers listed in the U.S. that reported in accordance with IFRS were required to provide reconciliations between IFRS and U.S. GAAP in Form 20-F filings. Since 2007, foreign private issuers listed on U.S. stock exchanges are no longer required to prepare reconciliations to U.S. GAAP if their financial statements are prepared in accordance with IFRS as issued by the IASB.[5] Thus IFRS financial statements are available within the U.S. market providing a favorable setting for examining the impact of differences in exogenously and endogenously determined reporting standards.[6] In

[4] We use the *Compustat* item "WDP" which includes 1) Impairment of assets other than goodwill, and 2) Write-down/write-off of assets other than goodwill, which excludes impairment of goodwill and impairment of unamortized intangibles. Therefore, it is possible the asset impairments include other amortizable intangible assets. However, while this is a limitation of our study its effect is mitigated since the size of intangible assets *(with either a definite or indefinite life)* other than goodwill (ITANO) is $248 ($0.56) million in mean (median) during our sample period while total fixed assets is $1,241 ($24.0) million.

[5] The SEC acceptance of financial statements prepared in accordance with IFRS as issued by the IASB was effective for fiscal years ending after November 15, 2007.

[6] A natural setting for the testing of our hypotheses would be to compare the U.S. GAAP write-down amount with the IFRS write-down amount for the same U.S. listed IFRS reporting firms in the pre-2007 period where U.S. GAAP reconciliations were required. However, when we reviewed the 20-F reconciliations for a sample of 33 of the 75 firm-

developing the sample, we exclude companies which do not indicate the accounting standard that was used and other missing data needed for our models. We include IFRS asset write-down firms reported as having standards that are compliant with IFRS as required by the U.S. SEC.[7] This produces 7,478 potential firm-year observations, of which 578 are IFRS and 6,900 are U.S. GAAP firm-year observations.

For our setting, we believe there could be two primary sources of potential selection bias. First, a foreign incorporated firm's decision to be cross-listed in the U.S. stock exchanges is not a random decision. Second, a foreign firm which is cross-listed in U.S. stock exchanges also has to select an accounting standard: U.S. GAAP or IFRS. This decision may not be a random decision, either. Successfully controlling for these potential selection biases is critical to draw any meaningful inferences from our results.[8]

To address the first selection bias issue, related to a foreign firm's decision to be cross-listed in the U.S. stock market, we adopt the two-stage approach suggested by Heckman (1979). In the first stage, we model a firm's decision to be cross-listed, and compute the Inverse Mill's Ratio, which is added as a control variable to the model to correct the selection bias in the second stage.

year write-downs in our pre-2007 sample period, we found that 20-F reconciliations either were not available (10 observations) or specific item reconciliation amounts for write-downs were not provided (22 observations). Due to the lack of data we are unable to directly compare the write-down amount under U.S GAAP and IFRS for the same firm.

[7] IFRS data is presented at pre-reconciliation amounts in the *Compustat North American* database for fiscal years ending prior to the SEC's elimination of the 20-F reconciliation requirement. To confirm this claim, we took a sample of 33 IFRS firms and compared their specific *Compustat* data with IFRS data from the firms' Form 20-F filings. Without exception, all *Compustat* data matched IFRS information.

[8] Ideally, we would like to compare U.S firms that use U.S. GAAP to U.S. firms that use IFRS in the U.S. market. This method will allow us to test the impact of accounting standards after controlling for the regulatory environment and firms' country of incorporation. There is very few cases, however, that U.S. incorporated firms that use IFRS in the U.S. market during our sample period. As an alternative, our current research design compares the U.S. firms that use GAAP and the non-U.S. firms that use IFRS in the same stock market. However, we acknowledge the limitation of this matched sample approach because the U.S. firms and the non-U.S. firms are fundamentally different. Consequently, even our matched sample approach and the Heckman's two-stage approach can not completely rule out the possibility that our results are driven by the fundamental difference between the U.S. vs. non-U.S. firms in the U.S. stock markets.

To address the second selection bias, related to a foreign firm's decision to select between U.S. GAAP versus IFRS, we compare IFRS asset write-down firm-years to their matched U.S. GAAP asset write-down firm-years, generated by a propensity matching process (see Tucker 2010). Our sample of foreign private issuers that report in accordance with IFRS in the U.S. is similar to those matched U.S. firms that use U.S. GAAP in the U.S. in size (market capitalization), profitability (ROA), and growth potential (book-to-market ratio). In the propensity matching procedure, we first estimate a probability (or propensity score) that a firm will select IFRS with a given set of firm characteristics (size, ROA, and book-to-market ratio). Then we identify a firm-year observation with the closest probability within the U.S. GAAP asset write-down firm-years to identify a matched firm-year observation.

Our matching procedure allows us to control for certain factors affecting management incentives to manipulate earnings i.e., profitability and growth potential (Burgstahler and Dichev 1997; Barton and Waymire, 2004; Graham et al. 2005; Badertscher, 2011). There are other factors, identified in prior research that may influence management incentives such as, CEO tenure and type of CEO compensation contract (Matsunaga and Park 2001). However, this information is not publically available for our sample firms.

In our matching procedure, we include industry and year of write-down in addition to the propensity score in order to mitigate the impact of within industry and between year macro-economic changes that may influence managerial incentives related to write-downs.[9] Since we match our U.S. GAAP and IFRS sample firm-years based on year of write-down and industry, we expect that any exogenous shock, such as the financial crisis that occurred during our sample

[9] Results from excluding the year of write-down from the sample matching process confirms our main results that is, significant differences between U.S. GAAP and IFRS for the *BATHINCENT* (χ^2=2.11, p=.07) and *SMOOTHINCENT* (χ^2=2.31, p=.06) variables.

period, affects both groups (U.S. GAAP and IFRS reporting firms) equally with respect to their reporting behavior.

The matching process resulted in 11 IFRS firm-year observations being eliminated because we were unable to appropriately match them with U.S. GAAP firm-year observations. Our final matched sample consists of 567 IFRS and 567 U.S. GAAP firm-year observations. Table 1 contains a summary of the sample selection process.[10]

[Insert Table 1]

Table 2 summarizes the demographics of the U.S. listed IFRS sample. Panel A of Table 2 reveals that Canada is the most represented country with 189 firm-year observations, over 33 percent of all IFRS firm-year observations in the sample. The United Kingdom is the next most represented country with 74 firm-year observations, over 13 percent of all IFRS firm-year observations in the sample. Panel B of Table 2 reveals that the year 2012 has more observations in our IFRS sample than any other year; this is primarily a result of Canada requiring the use of IFRS for listed firms beginning in 2011. Panel C reveals that the IFRS companies found in the *Compustat North America* dataset represent diverse industries according to the Global Industry Classification Standard (GICS). The most frequent industry among the IFRS firm-year observations according to GICS is Materials, making up over 21 percent of the sample.

[Insert Table 2]

Method

[10] Out of our sample of 567 IFRS firm-years, only 6 of the firm-years are voluntary adopters. This is consistent with our sample composition where we have 5 firm-year observations in 2004, prior to the 2005 mandatory adoption of IFRS in the European Union. Exclusion of voluntary adopters from our sample did not change the results substantively.

We examine the validity of our sample matching process using univariate statistics to compare the firm specific characteristics of the IFRS sample and the matched U.S. GAAP sample. We then analyze the relation between write-downs and unexpectedly low and unexpectedly high earnings for IFRS and U.S. GAAP firm-years separately using the following two-stage Heckman regression model (Lennox, Francis, and Wang, 2012), adapted from Riedl (2004) and Francis et al. (1996).[11]

$$WDP\_AT_{it} = \alpha + \beta_1 BATHINCENT_{it} + \beta_2 SMOOTHINCENT_{it} + \beta_3 \Delta INDROA_{it} + \beta_4 \Delta SALES_{it} + \beta_5 \Delta OCF_{it} + \beta_6 logMARKETCAP_{it} + \beta_6 MILLS_{it} + \varepsilon_{it} \quad (1)$$

where:

WDP_AT_{it} = Firm *i*'s pre-tax asset write-off (reflected as a positive amount) for period *t*, divided by total assets at the end of *t*-1;

$BATHINCENT_{it}$ = Firm *i*'s proxy for "earnings big bath" incentive, equal to the change in firm *i*'s pre-write-off earnings from *t*-1 to *t*, divided by total assets at the end of *t*-1, when this change is below the median of non-zero negative values of this variable, and 0 otherwise;

$SMOOTHINCENT_{it}$ = Firm *i*'s proxy for "earnings smoothing" incentive equal to the change in firm *i*'s pre-write-off earnings from *t*-1 to *t*, divided by total assets at the end of *t*-1, when this change is above the median of non-zero negative values of this variable, and 0 otherwise;

$\Delta INDROA_{it}$ = The median change in firm *i*'s (2-digit SIC) industry ROA from period *t*-1 to *t*;

$\Delta SALES_{it}$ = Firm *i*'s percent change in sales from period *t*-1 to *t*;

ΔOCF_{it} = Firm *i*'s change in operating cash flows from period *t*-1 to *t*, divided by total assets at the end of *t-1*;

$logMARKETCAP_{it}$ = Firm *i*'s proxy for size, equal to natural logarithm of market capitalization, calculated as fiscal-year closing stock price multiplied by number of outstanding common shares for period *t*;

$MILLS_{it}$ = Firm *i*'s inverse Mills ratio estimated from the Heckman's selection model

The dependent variable of the Heckman second-stage OLS model (1) is *WDP_AT*, which is the pre-tax asset write-down (reflected as a positive amount) for period *t*, divided by total assets at the end of *t*-1. In our model we include the variables, $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$, to

[11] Unlike Riedl (2004) and Francis et al. (1996) who use a Tobit regression model we use an OLS regression model since we do not include non-write-down firms in our sample. However, the use of Tobit regressions did not change our results. Further, we do not include a variable for change in earnings in our models because in our sample change in earnings is highly correlated (over 69%) with both of our variables of interest, $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$, as such inclusion in the models results in high variance inflation factors indicating severe multicollinearity producing unstable models.

capture reporting incentives that may exist when earnings are unexpectedly low, "big bath" incentives, and unexpectedly high, income smoothing incentives. $BATHINCENT_{it}$ is measured as the change in pre-write-off earnings from the previous year, divided by total assets of the previous year, when this change is below the median of non-zero negative values, and 0 otherwise. This variable has a predicted negative sign. $SMOOTHINCENT_{it}$ is measured as the change in pre-write-off earnings from the previous year, divided by total assets of the last year, when this change is above the median of nonzero positive values, and 0 otherwise. The predicted sign of the $SMOOTHINCENT_{it}$ variable is positive. These variables are constructed consistent with Riedl (2004) and Francis et al. (1996). We estimate two separate regression models: one for the U.S. GAAP sample and another for the IFRS sample, and test whether the coefficients for $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ obtained from each regression model are statistically different using the Wald test (Judge et al. 1985).[12]

We include in our regression model $\Delta INDROA_{it}$ capturing the effects of industry-specific changes on asset write-downs since economic conditions in less robust industries may require more asset write-downs than from firms in healthier industries. We measure this variable as the change from prior year in median return on assets (ROA) in industry as grouped by two-digit SIC code. We predict a negative association between write-downs (recorded as a positive amount) and $\Delta INDROA_{it}$. Next, we include two variables, $\Delta SALES_{it}$ and ΔOCF_{it}, to capture the effects of firm-specific performance changes on asset write-downs. $\Delta SALES_{it}$ is measured as the percentage change in sales of a firm from the prior year. ΔOCF_{it} is measured as the change in operating cash flows of a firm from the prior year, divided by the previous year total assets. We predict that both variables will have negative signs. We also include $logMARKETCAP_{it}$, *Year Dummy*, *Country*

[12] Conducting one regression with an indicator variable for IFRS and U.S. GAAP firms and a fully interacted model produces identical results.

Dummy, and *Industry Dummy* in the model to control for the effect of firm size, year, industry, and country, respectively. $logMARKETCAP_{it}$ equals the log of the firm's market value, calculated as fiscal-year closing stock price, multiplied by the number of outstanding common shares for the year.[13]

To control for the selection bias regarding IFRS firm's decision to be cross-listed in the U.S. we conduct the Heckman two-stage procedure (Heckman 1979; Lennox, Francis, and Wang 2012). We run our first stage model with IFRS firms' decision to be cross-listed as the dependent variable with a set of independent variables, identified by prior studies (Lang, et al. 2003). As well as controlling for company size (*logASSETS*), leverage (*LEVERAGE*), and profitability (*ROA*), we include the firm's industry median Tobin's q (*TOBINQ*) and the country's Gross Domestic Product (GDP). We also include industry and year indicator variables to control for the cross-sectional difference (e.g. the product market difference) and the fixed year effect. In addition, we include an indicator variable for the country legal system (English, French, German, Scandinavian, and others). From this first-stage model, we calculate the inverse Mill's ratio, which is added to the second-stage model (1) above.

V. RESULTS

Descriptive Statistics

[13] The quality of the auditor may also influence reporting behavior. Therefore, we conducted a regression model including an indicator variable based on size of the audit firm as a proxy for auditor quality, coded 1 for use of a Big 4 auditor and 0 otherwise. We found no significance for the audit quality variable and found very little impact on the coefficient estimates for our other variables; the coefficients on $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ were -.097 ($t = 2.31$, $p < .05$) and .183 ($t = 2.64$, $p < .05$) for the U.S. GAAP firms, respectively, and -.003 ($t = -.06$, $p > .1$) and -.003 ($t = -.08$, $p > .1$) for the IFRS firms, respectively. We do not include the audit quality variable in the main regression model because we do not have auditor data available for all firms resulting in a small reduction in our sample size ($n = 563$ and $n = 565$, for IFRS and U.S. GAAP, respectively).

Descriptive statistics on firm specific characteristics and the model variables for the IFRS and U.S. firm-years observations in the matched sample are provided in Table 3. The univariate comparison results presented in Table 3 support the validity of our sample matching selection process. The matched U.S. GAAP sample is similar to the IFRS sample in size (market capitalization), profitability (ROA), and growth potential (book-to-market ratio). Two-tailed t-tests of mean difference reveal that for the measurements of earnings management, neither the indicator of "big bath" reporting behavior ($BATHINCENT_{it}$) nor income smoothing behavior ($SMOOTHINCENT_{it}$) is significantly ($p < .10$) different for U.S. GAAP firms as compared to IFRS firms. We also find that size (measured by market capitalization), return on equity, and return on assets are not significantly different between IFRS and U.S. GAAP firm-years.

[Insert Table 3]

Panels A and B of Table 4 present the Pearson and the Spearman correlation coefficients among the model variables for the U.S. and the IFRS firm-year observations, respectively. Pearson (Spearman) correlation coefficients are presented in the upper (lower) right diagonal in the table. Examining the Pearson correlation coefficients, we find that the write-down amount (*WDP_AT*) for U.S. GAAP firms is highly correlated with both the $BATHINCENT_{it}$ (-.209, $p < .001$) and $SMOOTHINCENT_{it}$ (.295, $p < .001$) variables. Whereas, for IFRS reporting firms there is a much lower correlation between WDP_AT_{it} and the earnings management indicator variables, $BATHINCENT_{it}$ (-.130, $p < .01$) and $SMOOTHINCENT_{it}$ (.116, $p < .01$). Based on this univariate analysis, these correlations imply that there is a stronger relation between asset impairment write-downs and earnings management in U.S. GAAP firms than in IFRS firms. As expected the firm financial performance variables, $\Delta SALES_{it}$ and $\Delta OCF_{it,}$ are significantly correlated across the IFRS

and U.S. GAAP samples. These findings are consistent across both the Pearson and Spearman correlation analyses.

[Insert Table 4]

Empirical Findings

Table 5 presents the multivariate regression analysis and comparison of coefficients conducted to test whether there are differences in the asset write-down behavior of U.S. GAAP and IFRS firms. For the IFRS firms, we report results from the two-stage Heckman model as well as from the OLS model, following the suggestion from Lennox, Francis, and Wang (2012). The amount of variation that is explained by the models as indicated by the adjusted R^2 is 24% for the U.S. GAAP model and 22% for the IFRS Heckman model.

For the U.S. GAAP firms, reported in column (1), the coefficient on the $BATHINCENT_{it}$ *variable* (t-statistic = -4.68, $p < .01$) is significant and negative. Based on interpretation of similar results from prior research (Riedl 2004) this result suggests that U.S. GAAP firms may be recognizing asset write-downs in periods of unexpectedly low earnings implying "big bath" behavior. In addition, the coefficient on the $SMOOTHINCENT_{it}$ variable is positive and significant (t-statistic = 2.78, $p < .01$) suggesting that U.S. GAAP firms may be recognizing write-downs in periods of unexpectedly high earnings implying income smoothing behavior. The size variable, $logMARKETCAP_{it}$, is negative and significant ($p < .01$) indicating an association between the size of the firm and the write-down. Out of the two control variables structured to capture the effects of firm-specific performance on asset write-downs, the coefficient on $\Delta SALES_{it}$ is significantly negative (t = -2.24, $p < .05$), while ΔOCF_{it} reports only a marginally significant coefficient (t = -1.88, $p < .10$). These relations are consistent with the notion that a firm's poor financial performance is associated with asset write-downs. Overall, the U.S. GAAP findings suggest that

the asset impairment standard in U.S. GAAP, ASC 360-10-35, may provide managers discretion to opportunistically report impairment losses.

[Insert Table 5]

Our findings differ from those of Riedl (2004) on the behavior of U.S. firms in the post-SFAS 121 period. Riedl (2004) finds evidence of "big bath" reporting behavior but not of income smoothing behavior based on his sample of 265 firm-year write-down observations from the post SFAS 121, 1995 – 1998 period. Our full U.S. GAAP sample contains 5,425 firm-year write-down observations from the 2004 - 2012 period. As discussed in the Additional tests section, when we conduct the regression model for the full U.S. GAAP sample we find consistent results with our matched sample, both the $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ variables are significantly associated with asset write-downs. This indicates that the difference with Riedl's (2004) findings may be due to differences in the model specifications,[14] time period examined or the difference in number of sample write-down observations. That is, given the size of our sample there are more opportunities to observe both "big bath" and income smoothing behavior.

Column (4) in Table 5 reports the second stage of the Heckman model results for the IFRS firms. Neither the coefficient on $BATHINCENT_{it}$ (t = 0.41), nor the coefficient on $SMOOTHINCENT_{it}$ (t = 0.44) variable is significant. This finding suggests that the IFRS firms in our sample are not using asset impairment write-downs to engage in earnings management behavior. The size variable, $logMARKETCAP_{it}$, is negative and significant (t = -6.00, $p < .01$), consistent with our finding from the U.S. sample. None of the other control variables are

[14] Our model specification is different from that of Riedl (2004) in that unlike Riedl's model we do not include a variable capturing the change in firm pre-write-off earnings (ΔE) due to high correlations (over 69% in the U.S. GAAP sample) between ΔE and *BATHINCENT* and *SMOOTHINCENT.* In addition Riedl includes both write-down and non-write-down firms in his regression model.

statistically significant. Column (2) reports the results from the OLS model for the IFRS firms, and the main results are consistent with those from the Heckman two-stage model. That is, neither the $BATHINCENT_{it,}$ nor the $SMOOTHINCENT_{it}$ variable is significant.

We hypothesize that there is no difference in the association of long-lived asset impairment write-downs and unexpectedly low or unexpectedly high earnings for U.S. GAAP firms as compared to IFRS firms in the U.S institutional setting. To test these hypotheses we compare the regression coefficients between U.S. GAAP and IFRS firms, using the Wald test. The results, presented in Column (5) in Table 5, reveal that the association between $BATHINCENT_{it}$ and write-offs for U.S. GAAP firms is significantly higher than for IFRS firms ($\chi^2 = 3.68$, $p < .05$). The results, presented in Table 5, also reveal that the association between $SMOOTHINCENT_{it}$ and write-offs for U.S. GAAP firms is significantly higher than for IFRS firms ($\chi^2 = 5.55$, $p < .01$). These findings are not consistent with the hypotheses of no differences in H1 and H2.

Overall, our findings provide evidence that there is a difference in the write-off behavior for U.S. listed firms following U.S. GAAP as compared to firms following IFRS within the U.S. institutional environment. The association between asset impairment write-offs and "big bath" and income smoothing reporting behavior in U.S. GAAP firms is significantly higher than that observed in U.S. listed IFRS firms. U.S. GAAP firms appear to opportunistically time the write-down of asset impairments consistent with earnings management behavior whereas we find no significant relation between write-downs in the period of unusually low or high earnings for IFRS firms. Contrary to our hypotheses, our evidence implies that the differences in the asset impairment standards are influencing firm reporting behavior within the U.S. It may be that U.S. GAAP and/or IFRS reporting firms would react differently in other institutional environments. However, that question is beyond the scope of this study.

Additional Tests

Foreign Private Issuers Sample

To determine if unmeasured differences between U.S. domestic firms and foreign firms are influencing our results, we compare the asset impairment reporting behavior of foreign firms that use U.S. GAAP reporting in the U.S. (1,475 firm-year observations) to foreign firms that use IFRS for U.S. reporting purposes.[15] The results, presented in Table 6, are consistent with our sample of U.S. domestic firms. That is, the association between both $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ and write-downs is significantly higher for foreign firms reporting in accordance with U.S. GAAP than for foreign firms reporting in accordance with IFRS. Column (5) in Table 6 reports that the association between $BATHINCENT_{it}$ and write-offs for foreign firms that use U.S. GAAP in the U.S. is significantly higher than for foreign firms that use IFRS in the U.S. ($\chi^2 = 4.81$, $p < .05$). In addition, the association between $SMOOTHINCENT_{it}$ and write-offs for foreign firms that use U.S. GAAP is significantly higher than for IFRS firms, and this difference is marginally significant at the 10 percent level ($\chi^2 = 2.43$, $p < .1$).

This result confirms our main finding in that the association between asset write-downs and unexpectedly high and low earnings is stronger for firms that use U.S. GAAP as compared to those that use IFRS within the U.S. institutional setting regardless of whether those firms are incorporated within the U.S. or in a foreign country.[16]

[Insert Table 6]

Alternative Measures of Country Level Institutional Factors

[15] We did not form a matched sample from foreign firms that use the U.S. GAAP reporting for the corresponding IFRS firms because there are too few firm-year observations in each industry sector within the same year for the U.S. GAAP reporting foreign firms' sample, making it difficult to match a comparable U.S. GAAP firm for each IFRS firm.

[16] We note that foreign private issuers that choose to use U.S. GAAP for reporting purposes within the U.S. have self-selected to use U.S. GAAP. We have not controlled for self-selection bias in our model due to the small number of foreign firms that use IFRS, as discussed earlier. Therefore, while these results provide interesting information they should be interpreted with this limitation in mind.

It is also possible that while we controlled for country of origin within the regression analysis there are similarities among countries in institutional factors that are influencing our results. To determine if the country of origin of the foreign private issuers in our sample influences reporting behavior, we categorize countries based on whether they are an outsider or insider economy. We use this categorization since Leuz et al. (2003) observed significant cross-national differences in earnings management behavior across these groups. Leuz et al. (2003) grouped countries into three clusters based on similarities in their institutional characteristics identifying outsider economies and two levels of insider economies. The countries in our sample fall into two categories. We categorize Canada, Australia and the U.K., along with the U.S. as outsider economies with large stock markets, strong legal enforcement and outsider rights. Whereas, the remaining countries in our sample are classified as insider economies with smaller stock markets, a weaker investor protection environment and a somewhat weaker legal enforcement environment as compared to the outsider economies.

We conduct the regression analysis separately for the IFRS firms from outsider and insider economies. We find results consistent with our full IFRS sample findings, the $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ variables are not significant for either country grouping. For the outsider country sample, the coefficient on $BATHINCENT_{it}$ variable is 0.029 (p = 0.45) and on $SMOOTHINCENT_{it}$ is -0.009 (p = -0.24). For the insider country regression, the coefficients on the $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ are -0.049 (p = -0.91) and 0.022 (p = 0.66), respectively.

Asset Impairment Reversals

Since asset impairment reversals are a distinguishing feature of IAS 36 that may influence reporting behavior, we investigate whether the reversal of impairment losses, allowed under IFRS but not under U.S. GAAP affects our main results presented in Table 5. To identify reversals of

long-lived asset impairments we examined the 10-K and 20-F filings for the 567 IFRS firms included in our sample.[17] Through this process we obtained 63 observations of reversals.

We modified our main regression model (1) by adding a reversal variable, $REVERSAL_{it}$, and two interaction variables, $REVERSAL_{it} \times BATHINCENT_{it}$ and $REVERSAL_{it} \times SMOOTHINCENT_{it}$. The $REVERSAL_{it}$ variable is coded 1 if a firm has a reversal of a long-lived impairment loss during our sample period and zero, otherwise. We present the results of this regression model in Table 7. We find that the addition of these variables does not alter our main findings in Table 5. The $REVERSAL_{it}$ variable and the two interaction variables are not significantly associated with firms' write-off amounts for our sample IFRS firms. Further, consistent with our main findings, the coefficients on $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ are also not significant.

[Insert Table 7]

IFRS Sample Composition

It is also possible that IFRS firms from Canada are influencing our results since they comprise 33.3% of our IFRS sample. To examine this possibility, we partition our IFRS sample into Canadian and non-Canadian firms. We conduct the regression analyses, not reported, separately for the Canadian and non-Canadian IFRS firms. In each sample group, the findings are consistent with the full matched IFRS sample. That is, the $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ variables are not statistically significant for either Canadian or non-Canadian IFRS firms.[18] Moreover, the coefficients for $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ between those two subsamples (i.e.

[17] While companies typically disclose their reversal information in the *PP&E* footnote or in a separate section under *Impairment* we searched the entire 10-K and 20-F filings of each firm for reversal data.

[18] $BATHINCENT_{it}$ and $SMOOTHINCENT_{it}$ are $t = .81$ ($p > .1$) and $t = -.27$ ($p > .1$) for the Canadian firms, respectively; and $t = -1.36$ ($p > .1$) and $t = .91$ ($p > .1$) for the non-Canadian firms, respectively.

Canadian and non-Canadian IFRS firms) are not statistically different from each other indicating that our results are not driven by the Canadian firms in our sample.

U.S. GAAP Firms

Another possible explanation for our results is that our matching process identified U.S. GAAP firms with specific characteristics that are not generalizable to the U.S. GAAP population. However, when we conduct the regression model for the full U.S. GAAP sample (5,425 U.S. GAAP firm-year observations) we find consistent results, presented in Table 8, with our matched sample, both the $BATHINCENT_{it}$ ($t = -3.14$, $p < .01$) and $SMOOTHINCENT_{it}$ ($t = 3.94$, $p < .01$) variables are significantly associated with asset write-offs.

[Insert Table 8]

Macro-Economic Influence

The proxies used to capture macro-economic effects may also be influencing our results. In our model, we include the dummy variables for each of our sample years (*Year Dummy)*, to control for macro-economic annual differences, while Riedl (2004) includes the percentage change in Gross Domestic Product (GDP) in his model. To determine if our results are affected by GDP we include both variables, the change in GDP and the year dummy variables, and repeat our analysis. We find that the change in GDP is not statistically significantly associated with firms' write-off amounts and no other inferences from our model change.[19]

Other Issues

We also incorporate capital expenditures and restructuring charges in our models as additional control variables (results not reported) since these items may influence write-down behavior. The

[19] Results from including the change in GDP in the regression models and conducting the comparison of the regression coefficients between the U.S. GAAP and IFRS firms confirm our main results of significant differences on the $BATHINCENT_{it}$ ($\chi^2 = 2.57$, $p < .05$) and $SMOOTHINCENT_{it}$ ($\chi^2 = 6.15$, $p < .01$) variables.

inclusion of these two additional variables does not change our main results qualitatively. In addition, as a robustness test, we use fixed assets instead of total assets in the matching process. Analyses using this new matched control sample produce consistent results with our main findings.

VI. CONCLUSION

Prior research suggests that reporting incentives within specific institutional environments are more important to accounting quality than accounting standards (Ball, Robin and Wu 2003; Burgstahler, Hail and Leuz 2006). However, prior studies have not examined the effect of differences between U.S. GAAP and IFRS within a strong institutional environment. In this study, we examine whether the differences in impairment of long-lived asset accounting standards under U.S. GAAP (ASC 360-10-35) and under IFRS (IAS 36) influence firms' reporting behavior in the U.S. setting, where reporting in accordance with U.S. GAAP is required for domestic companies and in accordance with IFRS is allowed for foreign private issuers. To examine this issue we identify U.S. GAAP and IFRS firms listed in the U.S. that have asset impairment write-downs during the 2004 – 2012 period. From these firms we develop a matched sample of IFRS and U.S. GAAP firms based on firm specific characteristics using propensity matching scores and industry and year of write-down. We conduct univariate and multivariate analyses to examine the relation between asset write-downs and unexpectedly low and unexpectedly high earnings (prior to write-downs) for our IFRS and U.S. GAAP firm-year observations while controlling for firm and industry-level economic variables, as well as year of write-down and country. Additionally we employ the Heckman two-stage model for our IFRS sample to mitigate any potential selection bias.

Overall, our evidence indicates that the association between "big bath" and income smoothing behavior and asset write-downs is significantly higher for U.S. GAAP firms than for IFRS firms. Since we limited our sample to firms listed in the U.S., controlled for firm specific economic

factors, and matched our IFRS and U.S. GAAP firm-year observations, our evidence implies that the difference in reporting behavior is associated with the difference in the asset impairment standards. Given that prior research finds that, the institutional setting influences reporting behavior our findings should be interpreted specific to the U.S. environment. These findings should be of interest to financial statement users as they consider the impact of asset write-downs on U.S. GAAP reported income, as well as the effect on comparisons between U.S. GAAP and IFRS reported incomes that include asset write-downs.

Our findings suggest the possibility that IFRS motivates management to reflect the underlying firm economics by requiring impairment write-downs based on discounted cash flows and reversal of those write-downs when the asset's economics change. Whereas the U.S. GAAP recoverability test based on undiscounted cash flows, coupled with the prohibition on reversing impairment losses provides both managerial discretion and incentives that allow for earnings management behavior. This possibility is consistent with Riedl's (2004) suggestion that "the issuance of a 'brighter line' standard, combined with (possibly increased) capital market pressures for achieving earnings targets during the latter part of the 1990's (e.g., Dechow and Skinner 2000), may have enabled/driven managers to adopt more discretionary reporting choices under SFAS 121 relative to before the standard" (p. 850).

Our results are specific to IFRS firms listed in the U.S. and are not generalizable to IFRS firms listed outside of the U.S. where different institutional features may influence reporting behavior. While this is a limitation of our study, it is also a strength in that we are able to compare the behavior of firms following two different standards within the same institutional setting. Our study is also limited to publically available information. As discussed in the paper there are differences, in addition to the recoverability test and the provision for impairment reversal, that exist between

IFRS and U.S. GAAP. However, access to the data required to quantify the effect of these differences is not publically available.

Our study is subject to limitations. First, U.S. listed firms and foreign private issuers may be fundamentally different, and this difference may drive our results. Table 6 in our robustness test addresses this issue by comparing the asset impairment reporting behavior of foreign private issuers using U.S. GAAP .to foreign private issuers using IFRS for U.S. reporting purposes. However, we acknowledge that this test does not eliminate this concern. Second, our research design focuses on a firm's incentives to manipulate earnings and ignores the cost of earnings management since the ex-ante cost of earnings management is unobservable.[20] Finally, even though we have tried to hold managers' incentive constant across U.S. GAAP and IFRS firms in our research design, we cannot completely rule out the possibility that manager's incentives from reporting higher or lower earnings may be different for U.S. GAAP and IFRS firms, which can drive different reporting behaviors as documented in this study.

Regardless of these limitations, we provide evidence that differences in accounting standards result in differences in firms' reporting behavior within strong institutional environments. These findings should be of interest to accounting standard-setters as they consider the effectiveness of specific reporting standards.

[20] We thank the anonymous reviewer to bring these points to our attention.

REFERENCES

Alciatore, M., C. Dee, P. Easton, and N. Spear. 1998. Asset write-downs: a decade of research. *Journal of Accounting Literature* 17: 1-39

Alciatore, M., P. Easton, and N. Spear. 2000. Accounting for the impairment of long-lived assets: Evidence from the petroleum industry. *Journal of Accounting and Economics* 29: 151-172.

Badertscher, B. A. 2011. Overvaluation and the choice of alternative earnings manangment mechanisms. *The Accounting Review* 86 (5): 1491-1518.

Ball, R., A. Robin, and J.S. Wu. 2003. Incentives versus standards: Properties of accounting income in four East Asian countries. *Journal of Accounting and Economics* 36 (1-3): 235-270.

Banker, R., S. Basu, and D. Byzalov. 2014. The role of multiple impairment indicators in conditional conservatiism. *Working paper*: 204-236.

Barley, B., D. Fried, J. Rene, and J. Lavnat.2007. Reevaluation of Revaluations: A cross-country examination of the motives and effects on future performance. *Journal of Business Finance & Accounting* 34 (7) and (8):1025-1050.

Barton, J. and G. Waymire. 2004. Investor protection under unregulated financial reporting. *Journal of Accouting and Economics* 38: 65-116.

Burgstahler, D. and I. Dichev. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accouting and Economics* 24 (1): 99-126.

Burgstahler, D. C., L. Hail, and C. Leuz. 2006. The importance of reporting incentives: Earnings management in European private and public firms. *The Accounting Review* 81 (5): 983-1016.

Dai, D., F. Deng, and X. Mao. 2007. A research on impairment of assets in listed firms with negative earnings in China. *Frontiers of Business Research in China* 1 (3): 351-364.

Daske, H., L. Hail, C. Leuz, and R. Verdi. 2008. Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research* 46 (5): 1085-1142.

Dechow, P. M., D. Skinner. 2000. Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons* 14 (2): 235-250.

Duh, R-R., W-C. Lee, and C-C. Lin. 2009. Reversing an impairment loss and earnings management: The role Of corporate governance. *International Journal of Accounting* 44 (2):113-137.

Fairfield, P. M., K. A. Kitching, and V. W. Tang. 2009. Are special items informative about future profit margins? *Review of Accouting Studies* 14 (2-3): 204-236.

Francis, J., J. D. Hanna, and L. Vincent. 1996. Causes and effects of discretionary asset write-offs. *Journal of Accounting Research* 34: 117-134.

Gordon, E. A. and H. T. Hsu. 2014. Long-lived asset impariemtns and future operating cash flows under U.S. GAAP and IFRS. *Working paper*: 204-236.

Graham, J. R., C. R. Harvey, and S. Rajgopal. 2005. The economic implications of corporate financial reporting. *Journal of Accouting and Economics* 40 (1-3): 3-73.

Hayn, C., and P. J. Hughes. 2006. Leading indicators of goodwill impairment. *Journal of Accounting, Auditing & Finance* 21 (3): 223-265.

Heckman, J. 1979. The sample selection bias as a specification error. *Econometrica* 47 (1):153-162.

Henry, E., S. Lin, and Y. Yang. 2009. The European-U.S. "GAAP Gap": IFRS to U.S. GAAP Form 20-F reconciliations. *Accounting Horizons* 23: 121-150.

Houqe, M. N., T. van Zijl, K. Dunstan, and A. K. M. W. Karim. 2012. The effect of IFRS and investor protection on earnings quality around the world. *The International Journal of Accounting* 47 (3): 333-355.

Jeanjean, T. and H. Stolowy. 2008. Do accounting standards matter? An exploratory analysis of earnings management before and after IFRS adoption. *Journal of Accounting and Public Policy* 27 (6): 480-494.

Johnson, P. M., T. J. Lopez, and J. M. Sanchez. 2011. Special items: A descriptive analysis. *Accounting Horizons* 25 (3): 511-536.

Judge, G. G., W. E. Griffiths, R. C. Hill, H. L¨utkepohl, and T.-C. Lee. 1985. The Theory and practice of econometrics. 2nd ed. New York. Wiley: 20-28.

Kim, Y., H. Li, and S. Li. 2012. Does eliminating the Form 20-F reconciliation from IFRS to U.S. GAAP have capital market consequences? *Journal of Accounting and Economics* 53 (1-2): 249-270.

Lang M., J. Raedy, and W. Wilson. 2006. Earnings management and cross listing: Are reconciled earnings comparable to U.S. earnings? *Journal of Accounting and Economics* 42 (1-2): 255-283.

Lang M., J. Raedy, and M. H. Yetman. 2003. How representative are firms that are cross-listed in the United States? An analysis of accounting quality. *Journal of Accounting Research* 41(2): 363-386.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1997. Legal determinants of external finance. *The Journal of Finance* 52 (3): 1131-1150.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1998. Law and finance. *Journal of Political Economy* 106 (6): 1113-1155.

Lennox, C. S., J. R. Francis, and Z. Wang. 2012. Selection models in accounting research. *The Accounting Review* 87 (2): 589–616.

Leuz, C., D. Nanda, and P. Wysocki. 2003. Earnings management and investor protection: an international comparison. *Journal of Financial Economics* 69 (3): 505–527.

Li, Z., P. K. Shroff, R. Venkataraman, and I. X. Zhang. 2011. Causes and consequences of goodwill impairment losses. *Review of Accouting Studies* 16 (4): 745-778.

Loh, A. L.C., and T. H. Tan. 2002. Asset write-offs - managerial incentives and macroeconomic factors. *Abacus* 38 (1): 134 - 151.

Matsunaga, S. and C. W. Park. 2001. The effect of missing a quarterly earnings benchmark on the CEO's annual bonus. *The Accounting Review* 76 (3): 313-332.

Missonier-Piera, F.2007.Motives for fixed-asset revaluation: An empirical analysis with Swiss data. *The International Journal of Accounting* 42: 186-205.

PricewaterhouseCoopers LLP. 2013. IFRS and US GAAP: similarities and differences. Available at: http://www.pwc.com/en_US/us/issues/ifrs-reporting/publications/assets/ifrs-and-us-gaap-similarities-and-differences-2013.pdf

Ramanna K. and R. Watts. 2012. Evidence on the use of unverifiable estimates in required goodwill impairment. *Review of Accounting Studies* 17 (4): 749-780.

Riedl, E. J. 2004. An Examination of long-lived asset impairments. *The Accounting Review* 79 (3): 823-852.

Securities and Exchange Commission (SEC): 2002. *Commission Statement in Support of Convergence and Global Accounting Standards.* Release Nos. 33-9109; 34-61578. Available at: http://www.sec.gov/rules/other/2010/33-9109.pdf

Securities and Exchange Commission (SEC). 2007.*Acceptance from Foreign Private Issuers of Financial Statements Prepared in Accordance with International Financial Reporting Standards Without Reconciliation to U.S. GAAP*; *Proposed Rule.* Federal Register 72, No. 132, July 11. Washington, D.C.: Government Printing Office.

Securities and Exchange Commission (SEC). 2008. *Roadmap for the potential use of financial statements prepared in accordance with International Financial Reporting Standards by U.S.*

issuers; *Proposed Rule*. Federal Register 73, No. 226, November 14. Washington, D.C.: Government Printing Office.

Securities and Exchange Commission (SEC). 2010. *Commission Statement in Support of Convergence and Global Accounting Standards.* February 24. Washington, D.C.: Government Printing Office.

Securities and Exchange Commission (SEC): Staff Paper. 2012. *A Comparison of US GAAP and IFRS*. Available at: https://www.sec.gov/spotlight/globalaccountingstandards/ifrs-work-plan-final-report.pdf

Seybert, N. 2010. R&D capitalization and reputation-driven real earnings management.*The Accounting Review* 85 (2): 671-693.

Siggelkow, L. and H. Zülch.2013. Determinants of the write-off decision under IFRS: Evidence from Germany. *International Business & Economics Research Journal* 12 (7): 737-754.

Stout, L. 2012. *The Shareholder Value Myth: How Putting Shareholders First Harms Investors, Corporations and the Public*. San Francisco, CA: Berrett-Kohler Publishers.

Trottier, K. 2013. The effect of reversibility on a manager's decision to record asset impairments. *Accounting Perspectives* 12(1): 1-22.

Tucker, J. 2010. Selection bias and econometric remedies in accounting and finance research. *Journal of Accounting Literature*, 29: 31-57

Zucca, L., and D. Campbell. 1992. A closer look at discretionary write-downs of impaired assets. *Accounting Horizons* (3): 30-41.

APPENDIX: Variable Definitions

WDP_AT_{it}	=	Firm *i*'s pre-tax asset write-down (reflected as a positive amount) for period *t*, divided by total assets at the end of *t*-1;
$BATHINCENT_{it}$	=	Firm *i*'s proxy for "earnings big bath" incentive, equal to the change in firm *i*'s pre-write-down earnings from *t*-1 to *t*, divided by total assets at the end of *t*-1, when this change is below the median of non-zero negative values of this variable, and 0 otherwise;
$SMOOTHINCENT_{it}$	=	Firm *i*'s proxy for "earnings smoothing" incentive equal to the change in firm *i*'s pre-write-down earnings from *t*-1 to *t*, divided by total assets at the end of *t*-1, when this change is above the median of non-zero negative values of this variable, and 0 otherwise;
$\Delta INDROA_{it}$	=	The median change in firm *i*'s (2-digit SIC) industry ROA from period *t*-1 to *t*;
$\Delta SALES_{it}$	=	Firm *i*'s percent change in sales from period *t*-1 to *t*;
ΔOCF_{it}	=	Firm *i*'s change in operating cash flows from period *t*-1 to *t*, divided by total assets at the end of *t-1*;
$logMARKETCAP_{it}$	=	Firm *i*'s proxy for size, equal to natural logarithm of market capitalization, calculated as fiscal-year closing stock price multiplied by number of outstanding common shares for period *t*;
$MILLS_{it}$	=	Firm *i*'s inverse Mills ratio estimated from the Heckman's selection model;
$TOBINQ_{it}$	=	Firm *i*'s industry median Tobin's q;
$logASSETS_{it}$	=	Natural log of firm *i*'s total assets;
$LEVERAGE_{it}$	=	Firm *i*'s leverage ratio, measured as total liabilities divided by total assets;
ROAit	=	Firm *i*'s return on assets, measured as income before extraordinary items, divided by total assets;
$logGDP_{it}$	=	Natural log of firm *i*'s country Gross Domestic Product;
$LAWENGLISH_{it}$	=	An indicator variable which takes value of 1 if firm *i*'s country has English legal systems, 0 otherwise;
$LAWFRENCH_{it}$	=	An indicator variable which takes value of 1 if firm *i*'s country has French legal systems, 0 otherwise;
$LAWGERMAN_{it}$	=	An indicator variable which takes value of 1 if firm *i*'s country has German legal systems, 0 otherwise;
$LAWSCANDIN_{it}$	=	An indicator variable which takes value of 1 if firm *i*'s country has Scandinavian legal systems, 0 otherwise;
$LAWOTHER_{it}$	=	An indicator variable which takes value of 1 if firm *i*'s country has other legal systems, 0 otherwise.

TABLE 1
Sample Selection

	IFRS	US GAAP	Number of Firm-Year
Companies with total assets greater than zero (*Compustat North America*, 2004-2012)			82,596
Eliminate companies that:			
have no write-down data			(71,926)
have non-negative pretax write-down			(266)
have no recorded accounting standard			(17)
have missing regression variables			(2,697)
are listed on Canadian stock exchanges			(212)
IFRS and US GAAP companies with negative asset write-downs	578	6,900	7,478
Foreign incorporated firms who use US GAAP		(1,475)	(1,475)
Final IFRS and US GAAP firms	578	5,425	6,003
Propensity score matching procedure:			
IFRS and US GAAP firms with no matching counterpart	(11)	(4,858)	(4,869)
Final sample used in the study (firm-year)	**567**	**567**	**1,134**

To develop our sample, we first identify all public companies within *Compustat North America* reporting a write-down (*Compustat* data item "WDP") from 2004 to 2012. This produces 7,478 potential firm-year observations, of which 578 are IFRS and 6,900 are U.S. GAAP firm-year observations. Then we identify a matched U.S. sample firm-year for each IFRS firm-year, using a propensity matching process. Our final matched sample consists of 567 IFRS and 567 U.S. GAAP firm-year observations.

TABLE 2
IFRS Sample Distribution

Panel A: Final IFRS Sample—By Country

Country	No. of Firm-Years	Percent of Total Observations
Canada	189	33.3%
United Kingdom	74	13.1%
Australia	32	5.6%
France	31	5.5%
Germany	29	5.1%
Netherlands	21	3.7%
Switzerland	19	3.4%
South Africa	18	3.2%
Finland	14	2.5%
Sweden	9	1.6%
Other	131	23.1%
Total	567	100.0%

Panel B: Final IFRS Sample—By Year

Year	No. of Firm-Years	Percent of Total Observations
2004	5	0.9%
2005	39	6.9%
2006	31	5.5%
2007	34	6.0%
2008	53	9.4%
2009	46	8.1%
2010	56	9.9%
2011	133	23.5%
2012	170	30.0%
Total	567	100.0%

Panel C: Final IFRS Sample—By Industry

GICS Code	Industries	No. of Firm-Years	Percent of Total Observations
10	Energy	61	10.8%
15	Materials	119	21.0%
20	Industrials	47	8.3%
25	Consumer Discretionary	69	12.2%
30	Consumer Staples	50	8.8%
35	Health Care	66	11.6%
40	Financials	35	6.2%
45	Information Technology	41	7.2%
50	Telecommunication Services	52	9.2%
55	Utilities	27	4.8%
Total		567	100%

TABLE 3
Descriptive Statistics

	U.S. Matched Companies (N=567)			IFRS Matched Companies (N=567)			
Variable	**Mean**	**Median**	**Std. Dev**	**Mean**	**Median**	**Std. Dev**	**Mean Difference**
WDP_AT	0.020	0.004	0.054	0.023	0.004	0.058	-0.003
BATHINCENT	-0.031	0.000	0.082	-0.026	0.000	0.065	-0.005
SMOOTHINCENT	0.032	0.000	0.094	0.033	0.000	0.088	-0.001
Δ*INDROA*	-0.003	-0.001	0.012	-0.002	0.000	0.014	-0.005
Δ*SALES*	0.084	0.045	0.378	0.126	0.043	0.476	-0.042
ΔOCF_{it}	0.008	0.005	0.087	0.011	0.005	0.085	-0.003
logMARKETCAP	7.080	7.524	2.625	7.315	7.739	2.831	-0.235
Book-to-Market	0.922	0.575	1.247	0.907	0.618	1.027	0.015
ROA	-0.015	0.025	0.172	-0.022	0.019	0.175	0.006

This table reports the summary statistics for the variables in our sample. The sample consists of 567 IFRS and 567 U.S. GAAP firm-year observations over the period 2004–2012. Variables are defined in the Appendix.
*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively using two-sided t-test for mean difference. None of the differences is statistically significant at the 10 percent level.

TABLE 4
Pearson and Spearman Correlation Coefficients

Panel A: Pearson and Spearman Correlations for Matched U.S. GAAP Sample (n = 567)

Variable	WDP_AT	BATH INCENT	SMOOTH INCENT	ΔINDROA	ΔSALES	ΔOCF	*logMARKET CAP*
WDP_AT		-0.209***	0.295***	0.000	-0.079*	-0.095**	-0.314***
BATHINCENT	-0.274***		0.128***	0.168***	0.087**	0.353***	0.293***
SMOOTHINCENT	0.151***	0.260***		0.024	0.212***	0.343***	-0.209***
Δ*INDROA*	-0.089**	0.196***	0.083**		0.113***	0.068	0.081*
Δ*SALES*	-0.051	0.234***	0.194***	0.160***		0.292***	0.046
Δ*OCF*	-0.080*	0.334***	0.323***	0.071*	0.294***		0.087**
logMARKETCAP	-0.440***	0.345***	-0.139***	0.137***	0.157***	0.125***	

Panel B: Pearson and Spearman Correlations for Matched IFRS Sample (n = 567)

Variable	WDP_AT	BATH INCENT	SMOOTH INCENT	ΔINDROA	ΔSALES	ΔOCF	*logMARKET CAP*
WDP_AT		-0.130***	0.116***	-0.053	0.009	0.032	-0.380***
BATHINCENT	-0.214***		0.150***	0.042	0.050	0.128***	0.289***
SMOOTHINCENT	0.100**	0.294***		0.035	0.165***	0.271***	-0.306***
Δ*INDROA*	-0.112***	0.061	0.073*		0.077*	0.065	0.091**
Δ*SALES*	-0.030	0.150***	0.177***	0.091**		0.141***	-0.100**
Δ*OCF*	-0.004	0.192***	0.178***	0.100**	0.232***		-0.112***
logMARKETCAP	-0.446***	0.248***	-0.203***	0.110***	0.023	-0.039	

This table reports correlation coefficients between the variables in our sample. Pearson correlation coefficients are presented at the top-right half of the table; and Spearman correlations are presented at the bottom-left half of the table. Variables are defined in the Appendix.
*, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively using two-sided t-statistics.

TABLE 5
Asset Write-Downs and Unexpectedly High or Low Earnings: U.S. GAAP versus IFRS

Variables	Pred. Sign	U.S. GAAP OLS (t-stat) (1)	IFRS OLS (t-stat) (2)	IFRS Heckman 1st Stage (z-stat) (3)	IFRS Heckman 2nd Stage (t-stat) (4)	Difference (χ^2-stat) (5) = (1) -(4)
BATHINCENT	-	-0.100***	-0.005		0.017	-0.117**
		(-4.68)	(-0.11)		(0.41)	(3.68)
SMOOTHINCENT	+	0.185***	0.002		0.010	0.175***
		(2.78)	(0.06)		(0.44)	(5.55)
Δ*INDROA*	-	0.367***	-0.049		-0.041	0.408**
		(3.99)	(-0.36)		(-0.31)	(3.25)
Δ*SALES*	-	-0.016**	-0.002		-0.001	-0.015
		(-2.24)	(-0.27)		(-0.21)	(1.31)
Δ*OCF*	-	-0.066*	-0.012		-0.008	-0.058
		(-1.88)	(-1.45)		(-1.05)	(1.81)
logMARKETCAP	-	-0.004***	-0.010***		-0.014***	0.010***
		(-6.21)	(-4.00)		(-6.00)	(9.95)
MILLS					0.216***	
					(3.25)	
TOBINQ				0.750***		
				(9.76)		
logASSETS				0.245***		
				(31.46)		
LEVERAGE				-0.551***		
				(-8.46)		
ROA				-0.918***		
				(-15.58)		
logGDP				0.003		
				(0.17)		
LAWENGLISH				0.948***		
				(8.70)		
LAWFRENCH				0.527***		
				(4.68)		
LAWGERMAN				0.066		
				(0.57)		
LAWSCANDIN				0.698***		
				(5.43)		
LAWOTHER				1.364***		
				(7.28)		
Intercept		0.057***	0.065***	-5.681***	0.025	
		(8.57)	(2.72)	(-12.88)	(1.15)	
Year Dummy		Yes	Yes		Yes	
Industry Dummy		Yes	Yes		Yes	
Country Dummy		Yes	Yes		Yes	
Observations		567	567	245,596	567	
Adjusted R^2		0.24	0.20		0.22	

This table presents the multivariate regression analysis and comparison of coefficients conducted to test whether there are differences in the asset write-down behavior of U.S. GAAP and IFRS firms. We estimate the regression models using the pooled data over the period of 2004– 2012. The dependent variable is *WDP_AT* which is pre-tax asset write-down (reflected as a positive amount) for the year, divided by total assets for the prior year. All other variables are defined in the Appendix. For IFRS firms, we report results from the two-stage Heckman model (shown in columns 3 and 4) as well as from the OLS model (shown in column 2). *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, based on two-sided t-test.

TABLE 6
Foreign Incorporated Firms Adopting U.S. GAAP versus IFRS in U.S.

Variables	Pred. Sign	U.S. GAAP OLS (t-stat) (1)	IFRS OLS (t-stat) (2)	IFRS Heckman 1st Stage (z-stat) (3)	IFRS Heckman 2nd Stage (t-stat) (4)	Difference (χ^2-stat) (5) = (1) -(4)
BATHINCENT	-	-0.248**	-0.001		0.017	-0.265**
		(-2.45)	(-0.03)		(0.41)	(4.81)
SMOOTHINCENT	+	0.107	-0.004		0.010	0.097*
		(1.63)	(-0.16)		(0.44)	(2.43)
Δ*INDROA*	-	0.109	-0.054		-0.041	0.150
		(1.15)	(-0.40)		(-0.31)	(0.60)
Δ*SALES*	-	0.004	-0.002		-0.001	0.005
		(1.32)	(-0.23)		(-0.21)	(0.28)
Δ*OCF*	-	-0.087	-0.009		-0.008	-0.079*
		(-1.36)	(-0.36)		(-1.05)	(2.31)
logMARKETCAP	-	-0.004***	-0.010***		-0.014***	0.010***
		(-3.67)	(-3.95)		(-6.00)	(9.01)
MILLS					0.216***	
					(3.25)	
TOBINQ				0.750***		
				(9.76)		
logASSETS				0.245***		
				(31.46)		
LEVERAGE				-0.551***		
				(-8.46)		
ROA				-0.918***		
				(-15.58)		
logGDP				0.003		
				(0.17)		
LAWENGLISH				0.948***		
				(8.70)		
LAWFRENCH				0.527***		
				(4.68)		
LAWGERMAN				0.066		
				(0.57)		
LAWSCANDIN				0.698***		
				(5.43)		
LAWOTHER				1.364***		
				(7.28)		
Intercept		0.041***	0.069***	-5.681***	0.025	
		(2.79)	(2.75)	(-12.88)	(1.15)	
Year Dummy		Yes	Yes		Yes	
Industry Dummy		Yes	Yes		Yes	
Country Dummy		Yes	Yes		Yes	
Observations		1,475	567	245,596	567	
Adjusted R^2		0.11	0.20		0.22	

This table presents the multivariate regression analysis and comparison of coefficients conducted to test whether there are differences in the asset write-down behavior of foreign firms that use U.S. GAAP reporting in the U.S. to foreign firms that use IFRS for U.S. reporting purposes. We estimate the regression models using the pooled data over the period of 2004– 2012. The dependent variable is *WDP_AT*. All variables are defined in Appendix. For IFRS firms, we report results from the two-stage Heckman model (shown in columns 3 and 4) as well as from the OLS model (shown in column 2). *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, based on two-sided t-test.

TABLE 7
The Reversals of Asset Write-Downs for IFRS Firms

Variables	Pred. Sign	IFRS	IFRS Heckman	
		OLS	*1st Stage*	*2nd Stage*
		(t-stat)	(z-stat)	(t-stat)
$BATHINCENT_{it}$	-	0.004		0.026
		(0.08)		(0.50)
$SMOOTHINCENT_{it}$	+	0.002		0.010
		(0.06)		(0.47)
$\Delta INDROA_{it}$	-	-0.031		-0.022
		(-0.21)		(-0.16)
$\Delta SALES_{it}$	-	-0.003		-0.002
		(-0.33)		(-0.34)
ΔOCF_{it}	-	-0.010		-0.005
		(-0.37)		(-1.24)
$logMARKETCAP_{it}$	-	-0.010***		-0.014***
		(-3.94)		(-5.91)
$REVERSAL_{it}$		-0.001		-0.001
		(-0.06)		(-0.20)
$REVERSAL_{it} \times BATHINCENT_{it}$		-0.067		-0.073
		(-0.74)		(-0.55)
$REVERSAL_{it} \times SMOOTHINCENT_{it}$		-0.070		-0.096
		(-0.75)		(-1.17)
$MILLS_{it}$				0.216***
				(3.25)
TOBINQ			0.750***	
			(9.76)	
$logASSETS_{it}$			0.245***	
			(31.46)	
$LEVERAGE_{it}$			-0.551***	
			(-8.46)	
ROA_{it}			-0.918***	
			(-15.58)	
$logGDP_{it}$			0.003	
			(0.17)	
$LAWENGLISH_{it}$			0.948***	
			(8.70)	
$LAWFRENCH_{it}$			0.527***	
			(4.68)	
$LAWGERMAN_{it}$			0.066	
			(0.57)	
$LAWSCANDIN_{it}$			0.698***	
			(5.43)	
$LAWOTHER_{it}$			1.364***	
			(7.28)	
Intercept		0.067***	-5.681***	0.025
		(2.72)	(-12.88)	(1.15)
Year Dummy		Yes		Yes
Industry Dummy		Yes		Yes
Country Dummy		Yes		Yes
Observations		567	245,596	567
Adjusted R^2		0.20		0.22

This table presents the multivariate regression analysis to test whether asset impairment reversals may influence the asset write-down behavior of foreign firms that use IFRS for U.S. reporting purposes. We estimate the regression models using the pooled data over the period of 2004– 2012. The dependent variable is *WDP_AT*. The variable, *REVERSAL*, is coded 1 if a firm has a reversal of a long-lived impairment loss during our sample period and zero, otherwise. All other variables are defined in Appendix. *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, based on two-sided t-test.

TABLE 8
U.S. GAAP Firms – The Entire Population

Variables	Predicted Sign	U.S. GAAP OLS (t-stat)
$BATHINCENT_{it}$	-	-0.112***
		(-3.14)
$SMOOTHINCENT_{it}$	+	0.077***
		(3.94)
$\Delta INDROA_{it}$	-	-0.038
		(-0.48)
$\Delta SALES_{it}$	-	0.007*
		(1.73)
ΔOCF_{it}	-	-0.067***
		(-3.14)
$logMARKETCAP_{it}$	-	-0.006***
		(-10.85)
Intercept		0.074***
		(5.46)
Year Dummy		Yes
Industry Dummy		Yes
Country Dummy		Yes
Obs		5,425
Adjusted R^2		0.10

This table presents the multivariate regression analysis using the full U.S. GAAP sample (5,425 U.S. GAAP firm-year observations). We estimate the regression model using the pooled data over the period of 2004– 2012. The dependent variable is *WDP_AT*. All variables are defined in Appendix. *, **, *** indicate statistical significance at 10 percent, 5 percent, and 1 percent, respectively, based on two-sided t-test.