

# **Will Harmonizing Accounting Standards Really Harmonize Accounting?**

## **Evidence from Non-U.S. Firms Adopting US GAAP**

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# **Will Harmonizing Accounting Standards Really Harmonize Accounting? Evidence from Non-U.S. Firms Adopting US GAAP**

## **ABSTRACT**

International harmonization of accounting standards appears to be inevitable. However, little evidence exists regarding whether harmonizing accounting standards will result in actual harmonization of *accounting practices*. Using a sample of non-US firms that adopt US GAAP to provide evidence on this issue, we find that most firms that adopt US GAAP adjust their accounting methods to those required by US GAAP. Properties of the firms' accounting numbers also change significantly after adopting US GAAP, but do not fully converge towards that of US firms. In the cross-section, regulatory oversight is associated with more successful implementation of US GAAP; firm-specific capital market incentives are not. These results suggest that harmonizing accounting standards may result in more comparable accounting methods and numbers, but that effective regulatory oversight will be important in reaching this outcome.

*JEL classification:* F00, G15, M41

*Keywords:* Accounting choice; Accounting standards; International accounting; International financial reporting; US GAAP

## 1. Introduction

Proponents of international harmonization of accounting standards argue that a single set of standards would assure similar transactions are treated the same by companies around the world, resulting in globally comparable financial statements.<sup>1</sup> However, findings in the academic literature challenge whether one set of accounting standards would be applied consistently by firms operating in varying economic, political, and cultural settings. In fact, prior research on early users of IAS finds that firms are not compliant in meeting even the easily observable disclosure requirements (Street and Gray 2001). Additionally, studies of the properties of accounting output find that similar standards are applied very differently around the world (Ball, Robin and Wu 2003). These findings have lead many authors to conclude that global comparability will be driven by factors other than the accounting standards. Specifically, most authors point to either regulatory oversight or capital market pressures (Land and Lang 2002, Ball, Robin and Wu 2003, Burgstahler, Hail and Leuz 2006).

As a body of work, prior research has raised substantial doubt regarding whether a global accounting standard would result in comparable accounting around the world. However, prior studies suffer from at least one of two major limitations. First, the papers often compare similar *but not identical* accounting regimes. This makes it difficult to determine what drives the observed differences in accounting (Guenther 2002, Holthausen 2003, Leuz 2006). Second, studies frequently lack a benchmark for the proper application of the various accounting standards examined (Holthausen 2003). Thus, it is difficult to determine whether and how incorrect applications of accounting have occurred.

This paper uses a sample of firms and research design that overcomes these limitations. We examine 178 non-US firms that have voluntarily adopted US Generally Accepted Accounting

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<sup>1</sup> For example, Sir David Tweedie, Chairman of the International Accounting Standards Board argues that “If they all use the same methods and the accounting for one transaction is the same in Sydney, as it is in Seattle, as in Strasburg, as in Sheffield, then they know where they are, and there is a demand for that type of certainty.” (FEI 2001).

Principles (US GAAP) - generally viewed as an ‘international’ set of accounting standards with detailed guidance (Dye and Sunder 2001). The 27 countries from six continents represented by the sample firms reflect a wide range of reporting environments and institutional backgrounds. The diversity in this sample is similar to that likely to exist under any globally mandated set of accounting standards, providing a natural experiment to examine how a single set of standards is applied across companies with heterogeneous backgrounds.

We use two matched samples as benchmarks: US firms that report under US GAAP and non-US firms that report under local accounting standards. The matched samples were formed by matching on country (for the non-US matched sample only), industry, and size. They create reference points for examining relative compliance with US GAAP. Non-US firms using local standards are not expected to comply with US GAAP, providing a lower bound of US GAAP compliance; US firms are expected to comply with US GAAP and provide an upper bound. Combined, these samples allow us to examine whether non-US firms purporting to use US GAAP actually changed their accounting, or if they simply report a version of their home GAAP labeled as US GAAP.

We address two related questions. First, will non-US companies adopting US GAAP apply that GAAP in a consistent manner globally? Second, do regulatory oversight or capital market incentives impact the level of compliance in form and/or implementation? We investigate these questions by assessing both the accounting methods disclosed in the financial statements and the properties of accounting outputs (e.g., earnings). Prior research indicates these two features of international financial reporting are driven by different factors, so it is important to examine both (Nair and Frank 1980). This broad set of accounting attributes, combined with our sample and research design, provides a comprehensive view of which aspects of accounting are most likely to meet the goals of comparability espoused by proponents of accounting harmonization.

We test accounting method disclosure compliance using both a changes approach and cross-sectional comparisons among the matched samples. In the changes analysis, we find that non-US firms adopting US GAAP change accounting methods to comply with US GAAP. While some non-compliance remains, it is due to primarily to nondisclosure of certain accounting method choices, making it difficult to determine whether it is strictly a disclosure issue or evidence of non-compliant choices being applied in the preparation of the statements.

We then examine whether the properties of the accounting output also change with the adoption. Consistent with prior research demonstrating that the relation between cash flows and accounting accruals is a fundamental property of different accounting standards, we construct several variables that capture this basic accounting relation (i.e. the impact of making accrual adjustments to cash flows). Prior literature documents that the correlation between accruals and cash flows is generally less negative for firms reporting under US GAAP (e.g., Leuz et al. 2003, Lang et al. 2006) and that the behavior of net income varies in predictable ways under US GAAP (e.g., Dechow and Dichev 2002, Lang, Raedy and Yetman 2003, Lang et al. 2006). We also construct variables that measure the level of conservatism/timeliness in reported earnings. Although conservatism is not a deliberate property of US GAAP, it has been shown to differ systematically across countries and accounting standards (e.g., Bushman and Piotroski 2006, Watts 2003a, 2003b, Ball, Robin and Wu 2003). Our analyses indicate that properties of accounting outputs for US GAAP adopters converge substantially towards those of US firms (and away from the domestic matched firms), but that convergence is not complete. This suggests that accounting standards will impact the level of comparability, but also indicates a need to investigate other factors.

We then examine factors that potentially explain the variation in the implementation of US GAAP observed in our first set of results, focusing on regulatory and capital market factors. First, presuming that US regulators should be more familiar with monitoring and enforcing US GAAP

than regulators in other countries and given that the US regulatory oversight framework is often cited as being of high quality (Foerster and Karolyi 1999, Doidge, Karolyi, and Stulz 2004), we partition the sample into firms that have a security trading in the US and those that do not. We predict firms that cross-list in the US face a higher degree of regulatory oversight and will exhibit a higher level of compliance with US GAAP. However, Watts (2003a, 2003b) argues that accounting conservatism is not part of regulatory oversight, and instead is driven by litigation and contracting. Siegel (2005) shows that cross listing does not subject foreign firms to US litigation and we have no reason to believe that cross-listing impacts contracting. Accordingly, we do not expect regulatory oversight will impact the properties of accounting conservatism. As predicted, we find that these firms generally disclose more compliant accounting choices and exhibit base accounting properties (i.e., accruals) more consistent with the US matched sample than do firms without a US security. Also consistent with our predictions there is no evidence of differences in measures of conservatism across regulatory oversight partitions. Thus, regulatory oversight contributes to higher US GAAP compliance for our sample firms, but only for items that the SEC actively oversees.

Finally, we examine whether capital market incentives (need for equity capital, ownership structure, analysts following etc.) influence adopting firms' degree of compliance with US GAAP. Prior studies have suggested that these influences have a strong impact on reported accounting numbers (Land and Lang 2002). We develop a selection model of capital market incentives to adopt US GAAP, and then use predicted values to partition the US GAAP adopters into firms with low and high levels of capital market incentives. While we find that firms with high incentives generally have a higher level of compliance in disclosure, we do not find the properties of their accounting output differ across our proxy of capital market incentives.

Overall, the evidence suggests that global adoption of a single set of accounting standards has the potential to increase the comparability of accounting information across countries that

differ economically, politically, and culturally. This conclusion stands in contrast to relatively pessimistic conclusions in some prior research (Ball, Robin, and Wu 2003, Lang, Ready and Wilson 2006). Our results emphasize the crucial role of regulation, which has been relatively less emphasized in prior work (Leuz 2006). However, we find limited evidence that capital market incentives impact the implementation of accounting standards.

This paper proceeds as follows. Section 2 discusses relevant international accounting literature and motivation. Data and sample are described in section 3. Section 4 discusses results, and section 5 concludes.

## 2. *Motivation and Predictions*

Differences in accounting practices across countries can result in similar economic transactions being recorded differently. This lack of comparability complicates cross-border financial analysis and investment (e.g., Harris 1998, Hawkins 2000, Bradshaw, Bushee, and Miller 2004). International standard setters have argued that this dilemma could be solved by creating a single set of global accounting standards. However, accounting research indicates that global implementation of the standards would vary, resulting in a failure to achieve the desired comparability. That research has tested for comparability either by examining compliance with disclosure rules or comparing properties of accounting information globally.

Studies of compliance with disclosure requirements focus predominantly on the application of International Accounting Standards (IAS). Early studies document non-compliance across a large number of firms claiming to apply IAS in their audited financial statements (Cairns 2001, Street and Gray 2001). More recently, a high degree of non-compliance in disclosure was found in German Neuer Market firms that claimed to report with IAS or US GAAP (Glaum and Street 2003). Non-compliance for these easily verifiable disclosures casts serious doubt that a single accounting standard will be applied consistently on a global basis.

Additionally, many studies examine properties of accounting information across different accounting regimes. Overall, these studies indicate that similar accounting is applied very differently around the world. Ball, Robin and Wu (2003), an influential early study in the area, compares the timeliness of earnings in reporting bad news across several countries that have accounting systems based on common law sources. They document large variation in earnings across these countries and conclude, “international differences in reporting incentives inherently limit the extent to which international comparability of accounting information can be achieved through homogenization of accounting standards alone” (p. 259). Subsequent studies support the inferences of Ball, Robin, and Wu (2003). For example, Lang, Raedy and Wilson (2006) find that non-US firms’ 20-F earnings reconciliations from home-country GAAP to US GAAP are not comparable to earnings reported by US firms.

The general consensus from this literature is that both disclosure practices and properties of accounting information are unlikely to fully converge under a single set of global accounting standards. However, recent summaries of the literature call for further examination of these issues, particularly in regards to understanding which factors impact implementation of accounting standards (Ball 2006, Leuz 2006).

Prior studies face at least one of two limitations on their ability to generalize their results to the outcome that would occur with a single set of high quality standards. First, papers often compare accounting across similar *but not identical* accounting standards. Thus, the observed differences in accounting properties may actually be driven by (seemingly minor) differences in the accounting standards examined (Guenther 2002, Holthausen 2003, Leuz 2006). Second, studies frequently lack benchmarks for the proper application of the various accounting standards examined. For example, the early disclosure studies used the standards themselves as the benchmark, but IAS was unclear in major respects during that time – leaving much of the decision to judgment (Street and Gray 2001). Similarly, many of the subsequent studies on properties of

accounting information lack a reference point for properly applied accounting (Holthausen (2003)). Absent good benchmarks, it is difficult to determine whether and how incorrect applications of accounting standards occur. While this research provides valuable insights into the current features of financial reporting around the world, these limitations make it tenuous to generalize findings to a hypothetical global adoption of a single set of accounting standards.

In this paper, we use a sample of firms and research design that overcome these two limitations. The firms all report under the same accounting standards (US GAAP) but are domiciled across 27 different countries on six continents. This setting provides clear variation in institutional, cultural, and economic backgrounds representative of what is expected under any global adoption of a single set of accounting standards. In addition, we provide two benchmarks to the sample firms: (i) a matched sample of US firms (that obviously report under US GAAP) and (ii) a matched sample of firms from their home country (that report under their domestic GAAP). These benchmarks allow us to determine whether firms claiming to adopt US GAAP actually report accounting that is similar to that GAAP, or if they simply continue to report a version of their home-country GAAP labeled as US GAAP.

Our first prediction is that firms will exhibit a noticeable shift in their accounting disclosures and properties of accounting information after adopting US GAAP. The sample firms combined with the two benchmark samples permit us to examine the following hypothesis (stated in alternative form):

H1: *Non-US firms that adopt US GAAP disclose accounting method choices and exhibit properties of accounting information similar (dissimilar) to that of US (home country) firms.*

The literature argues that accounting standards are only one aspect that impacts the degree of harmonization of accounting practices (Ball 2001). Prior research has suggested two broad categories that will impact the success of harmonization: the regulatory environment and capital market incentives faced by preparers (e.g., Land and Lang 2002, Burgstahler, Hail and Leuz

2006). We examine both of these factors to identify the extent to which they affect proper implementation of US GAAP by our sample firms.

To examine the impact of regulatory environment, we partition our sample into firms that cross-list on a US exchange (approximately 54% of the sample) and those that do not. Firms that cross-list on a US exchange become subject to US regulatory review. Prior research has argued that US oversight is stricter than that faced in other countries (e.g., Coffee 1999, Lang, Lins, and Miller 2003).<sup>2</sup> Additionally, the US SEC has greater experience in reviewing financial information that is reported according to US GAAP. In comparison to regulators who rarely review US GAAP statements, this increased familiarity should allow the US SEC to more effectively review US GAAP financial statements. Thus, we expect that the subset of our sample firms that also cross-list in the US will exhibit disclosure compliance and properties of accounting information more similar to that of US firms.

As discussed later, we categorize our measures of properties of accounting information as relating to ‘base’ accounting properties (i.e., accruals-related) and ‘conservatism’ properties. While it is clear that the SEC is interested in application of proper accounting choices and accrual accounting, prior research argues that conservatism is not an explicit feature of the US governmental regulatory system (Watts 2003a). Rather, conservatism appears to be driven by litigation concerns (Basu 1997, Watts 2003a, 2003b). Siegel (2005) provides evidence that cross-listing in the US actually does *not* subject firms to the US litigation environment. Together, these

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<sup>2</sup> These papers propose an encompassing version of the “bonding” hypothesis, which assumes that cross-listed firms adopt the entire US regulatory and information environment when they cross-list. This suggests that our cross-listing partition captures more than just regulatory oversight. For example, cross-listed firms experience increased visibility, analyst following, and information environment (Lang, Lins, and Miller 2003, Lang, Raedy, and Yetman 2003). However, recent papers have challenged this encompassing version of the bonding hypothesis (i.e., Siegel 2005, Gozzi, Levine, and Shmukler 2006). Regardless of the status of this literature, if cross-listing proxies for the broader set of capital market influences predicted under the full bonding hypothesis, then we would find that *all* accounting attributes of cross-listed firms converge towards those of US firms, including those related to conservatism. As our subsequent results show, the results are more consistent with the more limited, regulatory interpretation of cross-listing that we provide in support of H2. Further, we provide direct tests of capital market influences in H3.

observations imply that US SEC oversight, will affect disclosure and base accounting properties, but not accounting conservatism.

H2: *Non-US firms that adopt US GAAP and list (do not list) a security on a US exchange will exhibit accounting disclosure and base properties of accounting information that are similar (dissimilar) to those of US firms. Cross-listing will have no impact on relative properties of accounting conservatism.*

In addition to the regulatory environment, prior research emphasizes that capital market incentives impact reporting behavior (e.g., Ali and Hwang 2000, Ball, Robin, and Wu 2003, Leuz, Nanda, and Wysocki 2003, Burgstahler, Hail, and Leuz 2006). Indeed, Land and Lang (2002) argue that such incentives have led to *de facto* harmonization in accounting implementation despite continuing variation in standards. If non-US firms that adopt US GAAP do so to accrue capital market benefits, then those firms with relatively more incentives will more completely implement US GAAP. We model our firms' exposure to various factors that proxy for capital market related incentives, and use this measure to partition the sample. We test the following hypothesis.

H3: *Non-US firms that adopt US GAAP and display high (low) capital market incentives will exhibit earnings properties similar (dissimilar) to those of US firms.*

### 3. *Sample Description*

#### 3.1 SAMPLE CREATION

The primary data used in this study are obtained from a custom download of the Primark Worldscope database that includes coverage from 1980 through February of 2001. The Worldscope database has been used in many other studies (e.g., Leuz et al. 2003, Bhattacharya, et al. 2003). Our sample firms are based outside of the United States and Canada and are identified as using US GAAP as their basis of financial reporting (henceforth 'sample').<sup>3</sup> For obvious

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<sup>3</sup> We exclude Canadian firms from our sample due to the implicit similarities between U.S. and Canadian GAAP. For example, the Multijurisdictional Disclosure System that allowed Canadian firms to file in the US using Canadian GAAP was in place throughout much of our sample period. The main rationale for this system was that the accounting standards and review environments were so similar. If Canadian firms are included in the analysis the statistical significance of many of the results decreases but the findings remain qualitatively similar.

reasons, we require all firms in our sample to have data for the accounting standards followed (i.e. US GAAP, local).

Worldscope identifies 223 firms as reporting under US GAAP at some point during our sample period. To validate Worldscope's classification of the accounting standards followed, we reviewed the most current annual report for which the firm was listed as employing US GAAP (generally either fiscal 1999 or 2000). With exceptions noted below, for most firms the audit opinion states that US GAAP was used for financial reporting. We find eight firms that Worldscope classifies as reporting under US GAAP but that actually report under other standards.<sup>4</sup> While these eight firms were the only observations with clearly identified miscoding, we also exclude firms based on several other items noted during our review of annual reports. For 18 of the remaining 215 firms we cannot find annual reports for the last year during which Worldscope identifies the firms as reporting using US GAAP but can find subsequent financial statements that indicate the firm no longer uses US GAAP. Presumably these firms once followed US GAAP but have now switched to some other GAAP. However, it is possible that the firms always followed non-US GAAP and were miscoded during some periods by Worldscope, we exclude these firms from our sample. We also exclude five of the remaining 197 firms because the audit opinion does not specifically identify which accounting standards the firm uses and three firms that have financial statements without an audit opinion. Finally, we exclude eight firms for which all data during our sample period is based on backfilling from historical financial statements filed as part of an initial public offering and three firms that are majority owned by other firms in the sample. The final sample consists of 178 firms.

Panel A of table 1 indicates that the sample firms represent 27 different countries from six different continents with concentrations in Germany (32.6% of the sample), Japan (20.2%) and the Netherlands (9.6%). Thirteen of the 178 firms have 1980 as their first year of US GAAP

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<sup>4</sup> Three of these firms report using German standards, two under IASB standards and one each under French, Irish and Chinese standards. There does not appear to be a systematic bias in the coding within any given country.

adoption. However, this is the earliest year on the database, and these 13 firms may have been following US GAAP for some time prior to 1980. Of the remaining 165 firms, 119 were added to the database after 1980 and report under US GAAP in the initial year of coverage (i.e., no data for the year prior to US GAAP adoption). For the remaining 46 firms, we can positively identify a switch to US GAAP from either local GAAP or International Accounting Standards while being covered by Worldscope.

Several aspects of the final sample reflect macroeconomic changes. For example, the majority of the German firms were added to the database in 1999 and 2000, consistent with these firms being listed on the recently founded ‘Neuer Market’ that allows registrants to file US GAAP financials.<sup>5</sup> Similarly, many of the European firms were added in the late 1990s as markets such as EASDAQ and SEAQ began to allow US GAAP for listings. On the other hand, Japanese firms make up the bulk of the 13 firms using US GAAP in 1980. This is consistent with reporting rules in Japan that have long allowed domestic firms trading on US exchanges to provide financial reports under US GAAP. Thus, the timing and coverage of firms reporting under US GAAP is consistent with changes in the financial markets that permit such reporting.

We construct two matched samples to be used for comparison purposes in several of the tests. The first sample consists of non-US firms that report under their respective local GAAP (henceforth ‘non-US’ sample). We do not predict or expect that the accounting method choices for the non-US sample firms should be compliant with US GAAP. Rather, we use the non-US sample as a benchmark to assess whether firms purporting to use US GAAP modify their accounting relative to similar firms in their home country. For each firm in our primary sample, we identify firms from the same country that follow local accounting standards. We attempt to match as closely as possible on (i) industry (using four digit SICs), (ii) calendar year, and (iii) market value. Preference for matching criteria follows this order. We are able to match all sample

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<sup>5</sup> See Leuz (2003) for a detailed discussion of this stock exchange.

firms with a firm from their home country and most firms at the two-digit SIC level. Similarly, most matched non-US firm-years are the same or within one year of the respective sample firm-year. The ability to obtain a match with reasonably close market values, our last matching criteria, varies greatly across countries.

The second matched sample consists of US firms. This control sample provides a benchmark for assessing whether the sample firms comply with US GAAP in a manner consistent with those of similar firms in the US. The matching criteria resemble that for the non-US sample with the exception of the country-level criterion. For most firms, we are able to achieve relatively close industry matches. However, the Worldscope database did not begin covering US firms until 1985. Thus, it is impossible to match calendar years for approximately 8.5% of firms with year 0 occurring prior to 1985.

From the above discussion, it is obvious that the firms in our sample self-selected to use US GAAP. This naturally leads to the question of whether the self-selection necessarily leads to a bias in interpreting the results. There are several reasons to believe self-selection bias does not have a large impact on our results, which are discussed in Appendix 1. There, we argue that there are strong ex-ante reasons to believe there is zero or very small correlation between adoption of US GAAP and the ability to implement that GAAP. Further, our research design includes matching and longitudinal analysis, both of which mitigate any self-selection biases that might exist. Finally, even if some bias remains, examining our sample of firms provides a number of benefits to our understanding of implementation of non-local accounting standards.

#### *4. Results*

##### 4.1 COMPLIANCE WITH US GAAP

###### 4.1.1 Measuring Compliance in Form with US GAAP

We first examine the accounting choices made by non-US firms adopting US GAAP to determine whether the firms actually adopt compliant accounting methods. The Worldscope

database provides information on 32 accounting method choices for each firm, covering a number of accounting choices such as goodwill, research and development (R&D), and financial statement cost basis. Many of the accounting method choices are merely descriptive in nature (e.g., reasons for disclosed contingent liabilities, explanation of the nature of extraordinary items recorded), and others are characterized by options that are all permissible under US GAAP (e.g., depreciation method choices). After removing accounting choices that are descriptive or nondiscriminatory, we retain 13 accounting method choices. Appendix 2 lists these choices, the alternatives we treated as being compliant with US GAAP, and those we treated as non-compliant.<sup>6</sup> This appendix also shows the percentage of *all* US firm-years on Worldscope that would be treated as having compliant accounting choices under our coding algorithm.<sup>7</sup> For the majority of the accounting methods, the overall US firm compliance level is greater than 95%, providing empirical support for our definition of compliance, as well as some assurance regarding the integrity of Worldscope's coding of accounting choices.<sup>8</sup>

Having classified each independent accounting choice as either compliant or not compliant with US GAAP, we next compute US GAAP compliance ratios, where the numerator is the number of accounting method choices that comply with US GAAP and the denominator is the

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<sup>6</sup> During our sample period, 1980-2000, there were changes in US GAAP for several of our coded accounting method choices. Our coding is based on US GAAP rules that were in place at the time the firm filed the financial statements. For example, prior to 1989 APB 19 allowed a wide range of funds definitions on the cash flow statement. However, when the FASB issued Statement of Financial Accounting Standards No. 95 effective in 1989, this latitude was reduced. Our coding was adjusted appropriately.

<sup>7</sup> Bradshaw, Bushee and Miller (2004) use the same set of accounting choices to examine whether firms with a greater proportion of accounting choices that conform to US GAAP attract more US investment. As part of their analyses, they use a sample of firms listing ADRs on US exchanges to examine the relation between 20-F reconciliations of home country statements and US GAAP. They find that the compliance ratio is significantly negatively related to the magnitude of 20-F reconciling items, indicating that firms with a less compliant ratio have a greater magnitude of reconciling items, providing further evidence that the ratios capture US GAAP conformity.

<sup>8</sup> Two accounting methods have a low percentage of compliance. Research and development expense is coded as consistent with US GAAP in 43.4% of the firm-year observations. Remaining observations were recorded as not reporting their treatment of such expenses. This low level of compliance is likely due to firms not incurring material R&D costs, and hence not disclosing a method of accounting for R&D. Second, the funds definition on the statement of changes in financial position has a compliance rate of 86.0%. This likely reflects uncertainties that continued to exist after the issuance of Statement of Financial Accounting Standards No. 95 regarding what definition of cash was to be reconciled on the statement of cash flows. In unreported analysis, we find that the compliance rate of this method climbs steadily over the five years following the issuance of the standard and approaches 100% compliance by 2000.

total number of accounting method choices under consideration. While the treatment of disclosed non-compliant methods is clear (such as expensing taxes on a cash basis), the treatment of non-disclosed items is not. One could argue that US GAAP requires disclosure of many of these items, and hence non-disclosure is tantamount to non-compliance with US GAAP. Alternatively, one could argue that non-disclosure is less problematic and should not be treated as non-compliance or that non-disclosure simply reflects that the related financial statement accounts are not applicable or immaterial (e.g., R&D). As the proper assumptions are not obvious, we compute two different ratios for each firm.

RATIO1 is defined as the number of accounting method choices in compliance with US GAAP divided by the number of all accounting choices we code ( $n=13$ ).<sup>9</sup> This ratio assumes that any non-disclosed accounting choices are inconsistent with US GAAP. This ratio is a strict interpretation of US GAAP, placing equal emphasis on disclosure and validity of accounting method choice. RATIO2 relaxes the non-disclosure assumption by including only accounting methods the firm discloses. The total number of methods consistent with US GAAP is then divided by the total number of items disclosed. The number of accounting methods included in the denominator of this ratio can vary across both firms and years.

#### 4.1.2 Tests of Disclosure Compliance with US GAAP

Figure 1 provides the distribution of compliance ratios for the sample firms and their non-US and US matched samples; table 2 provides distributional statistics and tests of differences among the compliance ratios. For RATIO1, the evidence suggests that many non-US firms claiming to use US GAAP (sample firms) are not fully compliant with US GAAP. In fact, the mean firm complies with just over half of the accounting choices. The pattern improves markedly for RATIO2, which does not penalize non-disclosure. Mean (median) compliance with US GAAP

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<sup>9</sup> The numerator is simply a count variable, and we transform it to a ratio to be consistent with the alternative measure, RATIO2, discussed below.

climbs to 93.7% (100%). The appreciable shift in the distribution shown in figure 1B relative to 1A suggests incomplete disclosure characterizes the financial reporting of many non-US firms. Given the unobservability of the non-disclosed items, it is impossible to tell whether they are simply non-applicable, applicable and not disclosed but compliant with US GAAP, or strategically not disclosed due to non-compliance with US GAAP.

For 46 of the firms we have time-series data regarding accounting choice that allows us to examine whether these firms actually change accounting choices as they adopt US GAAP or if they have always been more compliant than their non-US matches. Where such data is available, we compare the year US GAAP is adopted (year 0) to the 3 years before and after adoption (labeled years -1, -2, -3, and +1, +2, and +3). Figure 2 shows this analysis, which finds our sample firms made noticeable accounting method changes in the year of US GAAP adoption. There is a slight drift upward in years -2 and -1, but the major changes occur in the year of official adoption.

Combined, these results suggest that the sample firms are significantly more compliant with US GAAP than their matched non-US counterparts, indicating the sample firms are making at least some attempt to comply with US GAAP as they claim. The significant changes in disclosed accounting method choices are consistent with H1. However, final interpretation of the results on our measures of compliance relies primarily on how one views non-disclosure. If one believes that non-disclosure indicates a *non-applicable* accounting method, then RATIO2 points towards a strong attempt to properly implement US GAAP. This interpretation might be due to the industry and size matching not properly controlling for firm characteristics. Alternatively, the non-disclosure could reflect persistent cultural differences in disclosure (Hope 2003). Thus, firms may be following accounting methods required under US GAAP, but simply failing to disclose those accounting methods. Finally, it is also possible that managers are purposely withholding disclosure of accounting methods that are non-compliant with US GAAP. In the absence of

disclosure, it is not possible to discriminate among these explanations, so we rely on the observed properties of accounting output, discussed next.

#### 4.2 PROPERTIES OF ACCOUNTING OUTPUT

For all variables, our analyses are cross-sectional within sample and use all data available within the three years prior to (periods -3, -2, -1) and/or three years subsequent to (period +1, +2, +3) adoption of US GAAP.<sup>10</sup> We focus on two categories of accounting properties: ‘base’ accounting relations and ‘conservatism/timeliness’ properties. The first category relies on accruals being the defining characteristic of any accounting system, representing judgments and adjustments made to cash flows to arrive at accounting income. Accordingly, differences in accounting methods should not impact cash flows, but should influence the level of accruals for a given level of cash flows. Two of our variables measure accruals directly. The first is the univariate correlation between accruals and cash flows; the second is the standard deviation of the Dechow and Dichev (2002) residual (hereafter, ‘Dechow-Dichev residual’).<sup>11</sup> Cash flows are net cash flows from operations, and accruals are computed as the difference between net income (before extraordinary items and preferred dividends) and cash flows. Both variables are scaled by beginning total assets. Consistent with prior research (Leuz et al. 2003, Lang et al. 2006) we also examine the variance of the absolute value of change in net income as another measure of accrual effects.

Our second category captures conservatism or timeliness of bad news loss recognition (e.g., Ball, Kothari and Robin 2000, Ball, Robin and Wu 2003, Ball and Shivakumar 2005, Lang, Raedy, and Wilson 2006). Prior studies clearly demonstrate that timeliness of recognizing bad news events is a distinguishing feature of accounting information across different reporting

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<sup>10</sup> This results in sample sizes that vary according to the availability of data, which is common in this literature.

<sup>11</sup> Dechow and Dichev (2002) use OLS regressions to examine the extent to which accruals can be explained by lagged, contemporaneous, and next period cash flows. Their study examines US firms only, and they interpret a smaller standard deviation of residuals as indicative of higher quality earnings. We are not aware of any studies that examine this variable in an international reporting context. Thus, it is an empirical question whether their interpretation holds in other settings, so our tests of differences are non-directional.

environments. We use four measures of conservatism/timeliness (hereafter ‘conservatism’) identified in prior research: frequency of large negative net income, skewness of net income, the coefficient on the interaction of negative returns and net income as described in Basu (1997), and the coefficient on negative cash flows as described in Ball and Shivakumar (2005).

In table 3, we report sample means or distributional statistics for each variable. For each sample, we report statistics for data pooled across the three years subsequent to adoption of US GAAP by the sample firms (columns labeled ‘After’). For the sample firms only, we also tabulate means for data pooled across the three years prior to adoption of US GAAP (labeled ‘Before’). Sample sizes (i.e., firm-years) are noted below each test statistic. Significance levels for tests of differences across samples and between periods (for the US GAAP adopters) are indicated next to each test statistic.

Results for the base accounting relations are presented in panel A of table 3, and results for conservatism in panel B. For the sample firms, the Before-After comparison in panel A indicates that the accruals-cash flows correlation becomes significantly less negative and the variance of net income changes increases following adoption of US GAAP. We find no significant change in the Dechow-Dichev residuals. Similarly, comparison between the sample and non-US matched sample indicates that after adoption of US GAAP, the sample firms differ significantly from the non-US matched sample for all three variables. Comparing the sample and US firms yields mixed results. There is no statistically significant difference between the accruals-cash flow correlations and Dechow-Dichev residuals, consistent with successful implementation of US GAAP by the sample firms. However, the variance of net income changes remains significantly higher for the US firms. Overall, the results in table 3 indicate noticeable changes in the properties of accounting for the sample firms away from that of the non-US counterparts and towards that of US firms.

Panel B of table 3 presents analogous tests for measures of conservatism. Again, most of the measures demonstrate a convergence of reported accounting numbers by the US GAAP adopters towards that of US firms. The within sample test indicates three of the four variables change to be more consistent with US firms.<sup>12</sup> Similarly, three of the four variables are statistically indistinguishable from those of US firms. Additionally, for two of the four variables, the sample firms report accounting numbers that diverge predictably from the non-US matched sample. As with the base accounting relations in panel A, the overall evidence in panel B indicates an adjustment in accounting properties post US GAAP adoption. The results for base accounting properties and conservatism are consistent with the prediction in H1.<sup>13</sup>

#### 4.3 IMPACT OF REGULATORY OVERSIGHT

H2 predicts regulatory oversight will impact the degree of compliance with US GAAP. Results of testing this hypothesis are presented in table 4. As predicted, the results show that firms with securities trading in the US have significantly higher mean (and untabulated median) disclosure compliance ratios when compared to firms without US securities. Additionally, panel A of table 4 shows that for all three base accounting metrics, firms subject to US regulation exhibit accounting properties that are closer to those of US firms. This is consistent with regulatory oversight impacting the base accrual properties of US GAAP. Also consistent with our predictions, Panel B of table 4 finds no relation between conservatism and US regulatory oversight. Overall, our results are consistent with both components of H2.

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<sup>12</sup> The Basu Return\*Dummy coefficient is the only insignificant variable. The relatively low magnitudes of the coefficient estimates (e.g., approximately 0.03) are similar to prior research (e.g., Ball, Robin, and Wu 2003), with the exception of US firms, where we obtain an estimate of 0.12 relative to approximately 2-3X this magnitude. Our sample size is relatively small and the resulting Basu coefficients appear to be relatively unstable. In untabulated analysis, we have replicated that this instability is common in small samples using the Basu approach.

<sup>13</sup> We also compared the properties of accounting outputs for firms with the highest compliance ratios with those of firms with the lowest ratios. If compliance in form leads to compliance in implementation, we expect the high compliance in form group to exhibit accounting numbers with properties closer to those of US firms. For the base accounting relation variables, we found evidence consistent with higher compliance in form being associated with a less negative accruals-cash flows correlation, higher variance of net income changes, and lower Dechow-Dichev residuals (the last two statistically significant). However, for the conservatism variables, we find limited evidence of any difference between the subsamples.

These results highlight the importance of regulatory oversight in achieving comparability of accounting data (Street 2002). Our results imply that sufficient regulatory oversight can overcome (or at least mitigate) the institutional incentives that prior research indicates will hinder harmonization (Ball, Robin and Wu 2003, Lang, Raedy and Wilson, 2006). However, our findings also indicate that users of financial information will need to be aware of which properties of accounting are reviewed by regulators, since it is likely that unreviewed items (e.g., conservatism) will be less comparable.

#### 4.4 CAPITAL MARKET INCENTIVES

Our final analysis provides evidence for H3 regarding firm-specific incentives to properly implement US GAAP. H3 argues that conditional on having adopted US GAAP, firms with greater incentives should be more motivated to properly implement it. To test H3, we first must model firms' capital market incentives. We develop a model that estimates capital market incentives of firms that adopt US GAAP relative to the matched sample of home country firms that continue to report on their domestic GAAP. We then use the fitted values from this model to partition the firms that adopt US GAAP into those with high vs. low capital market incentives.

Table 5 present the comparison of firms adopting US GAAP with those reporting under domestic standards. Panel A of table 5 presents tests of differences in means and medians of various characteristics (discussed below), while panel B examines the relation between these variables and the probability of adopting US GAAP using a logit analysis.<sup>14</sup> We first consider whether non-domestic equity security listings are associated with the decision to adopt US GAAP, consistent with US institutional investor preferences (Bradshaw, Bushee and Miller 2004). Firms that list on multiple exchanges are likely to have a wide range of shareholders examining their financial statements, so we count the total number of exchanges on which the firm trades

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<sup>14</sup> Given our country-level matching procedure, we need not examine country-level characteristics. The firm-level factors we focus on are related to a need or incentive to communicate with global external firm stakeholders.

(#EXCHANGES). Consistent with our expectations, univariate analyses show that the sample firms to be more likely to trade on a greater number of exchanges.

Firms with a high-level of block shareholders can communicate to these groups informally or by providing additional analysis on request. Accordingly, such firms are less likely to need to use their formal accounting system as a means of external communication. Consistent with this, we find that the proportion of shares closely held (by officers, directors and their immediate families, pension plans, and large block shareholders, CLOSEHELD) is negatively related to the likelihood a firm will chose to report using US GAAP. Conversely, firms that rely heavily on external capital providers are likely to benefit from US GAAP. We measure the absolute value of net financing from issuance and retirement of stock and debt (ABSEXFIN). The sample firms have significantly higher ABSEXFIN, indicating they are likely to benefit from reporting under an internationally recognized set of accounting standards.

Managers might be able to enhance the external credibility of financial reports by hiring an established and internationally recognized auditing firm. Indeed, our sample firms are more likely than their non-US counterparts to be audited by one of the big four international accounting firms (BIG4).<sup>15</sup> Similarly, a large and active analyst following may reassure external investors that sophisticated users are analyzing the firm's financial information. However, we find no relation between analyst following (NUMEST) and the adoption of US GAAP.

Debt lenders tend to make conservative investment decisions, leaving high growth and innovation-oriented firms to struggle for capital in debt-based systems (Leuz and Verrecchia 2000). Thus, we expect our sample firms are more likely to be high growth firms investing in innovation. We examine sales growth (GROWTH) and research and development (RD) of our firms, with mixed results. Consistent (inconsistent) with expectations, RD (GROWTH) is significantly higher (no different) for the sample firms. A caveat here is that both variables are

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<sup>15</sup> Approximately 25% of our sample firms were missing data on the auditor used by the firm. For these firms, we searched several databases, such as One Scope and Compact Disclosure to identify their auditor.

calculated using information produced under different accounting systems, which may add noise or bias to a comparison across the samples. We also include control variables for firm performance (ROE) and size (in \$US, LOGMV). ROE does not differ between the non-US and US GAAP adopters, but LOGMV is significantly larger for sample firms.

We use the fitted values from the logit model to proxy for capital market incentives within our firms. In table 6, we partition the sample of US GAAP adopters based on the fitted values and revisit the earlier analyses for properties of reported accounting numbers. While the high incentive firms are significantly more compliant in disclosure (as measured by RATIO1), none of the seven output variables are statistically significant in predicted directions, *inconsistent* with the prediction in H3. Thus, in contrast to our results conditional on regulation, these results offer no support for capital market incentives being a significant determinant of the proper implementation of accounting standards.<sup>16</sup>

## 5. *Conclusion*

Accounting standard setters and regulators around the globe are striving to harmonize accounting standards with the goal of creating one set of high quality accounting rules to be applied around the world. Little evidence exists regarding the feasibility of this goal. In this paper, we examine a sample of non-US firms that adopt US GAAP as their primary accounting standards to provide evidence related to the use of a single set of detailed accounting standards across widely varying cultural and institutional settings. Our sample firms are domiciled in 27 different countries across six continents, representing significant geographic, economic, political, and cultural diversity. Accordingly, our sample and research design provides a unique opportunity for simulating the environment that is likely to occur when a globally harmonized set of standards is implemented.

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<sup>16</sup> While there are three significant differences on the table, all are in the opposite direction of our predictions. Our prior predictions provide no explanation for why capital market incentives would lead to *less* successful application of US GAAP.

We find that adopting US GAAP significantly alters non-US firms reported accounting method choices, and impacts the properties of reported accounting numbers in terms of accruals-cash flows relations and some measures of conservatism. In addition, we find that regulation generally increases compliance in disclosed accounting choices and generates accrual relations similar to US firms, but has little impact on measures of conservatism. We find no support for capital market incentives being a primary driver of compliance. Overall, we interpret our results as consistent with harmonization of accounting standards being likely to have a significant impact on increasing global comparability of accounting information.

Our study is subject to several caveats. First, our conclusions regarding whether sample firms actually adjust accounting method choices to be compliant with US GAAP are dependent on assumptions made regarding non-disclosure of accounting method choices. Treating non-disclosure as a violation, we conclude that sample firms are not compliant with US GAAP. Relaxing this assumption, we conclude that most sample firms are compliant with US GAAP, although a non-trivial number of firms appear non-compliant. Second, as with much of the international literature, many of our tests rely on small samples due to data limitations. Third, the firms in our sample implement US GAAP in environments where it is not normally used. Many of the agents that constitute the support structure for local GAAP, such as auditors and regulators, may not be as efficient in helping to implement US GAAP. Obviously, if a broadly used international set of standards was created, the supporting agents would become more familiar with these standards and overall compliance (including disclosure) might be higher than suggested here.

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## Appendix 1: Self-selection vs. self-selection bias

Firms in our primary sample have self-selected to report under US GAAP rather than their home-country GAAP, raising the obvious question of how such self-selection impacts the empirical results. The primary issue is whether this self-selection biases our ability to generalize the results. While recent research in accounting and finance has often made econometric adjustments in an attempt to account for self-selection bias, methodologies are largely based on advances in the labor economics literature (e.g., the effect of unionization or training on wages). This appendix draws analogies between that literature and our study to address self-selection bias, and discusses three reasons why such self-selection concerns need not limit the contribution of our study.

Self-selection bias is a correlated omitted variable problem (e.g., Heckman 1979, 1990, 2000, Li and Prabhala 2006, etc.). It is often overlooked that self-selection does not necessarily create bias; there must be correlation between the selection criteria and the dependent variable of interest (Heckman 1979, 1990, Robinson 1989). For example, if an individual joins a union based on private information about the relative value of union membership to him, then that private information must be modeled in the research design and/or statistical tests examining the wage benefits from joining a union. If these selection criteria are correlated with observed wages but not modeled by the researcher (e.g., nonunion alternatives undesirable), a classical correlated omitted variable problem arises. If the decision, however, is due to factors either unrelated to the treatment or dependent variable, then self-selection bias is not a concern (e.g., unknowingly joined a union due to confusing human resources paperwork).<sup>17</sup>

In our study, it seems reasonable that firms adopt US GAAP when they perceive it will have some benefits, resulting in self-selection. However, our interest is not in benefits of adopting US GAAP *per se*, but whether non-US adopting firms implement US GAAP similar to implementation by US firms. The self-selection to adopt US GAAP leads to self-selection *bias* only if the non-US firms' assessment of potential benefits from US GAAP adoption is correlated

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<sup>17</sup> Many years ago, both of the authors inadvertently became union members (temporarily) for this reason.

with the ability to properly implement US GAAP. If there is no correlation between adoption and implementation ability, then our sample firms' self-selection does not create a self-selection *bias*. If there is correlation, but it is adjusted for in research design, then there is no self-selection bias in interpreting the results. In this appendix, we discuss three items that suggest self-selection bias is not a limiting factor in this study: (1) we argue that there are reasons to believe that adoption and ability are uncorrelated, (2) our matched sample research design likely mitigates any residual self-selection bias, and (3) even allowing for self-selection bias, our results provide useful evidence to the literature.

(1) *No correlation between decision to adopt and ability to implement*

There are several economic reasons to expect zero or low correlation between US GAAP adoption and implementation ability. First, managers may be uncertain as to their ability to implement US GAAP, particularly relative to the ability of other firms. Such uncertainty (often referred to as "imperfect foresight"), leads to low or zero correlations between adoption and outcomes (Heckman 1990). Second, firms that do not expect benefits from adopting US GAAP are not likely to adopt even if they could properly implement US GAAP. Indirect relations of this type lead to zero correlations, and thus no bias (Robinson 1989). Third, empirical evidence in our paper and earlier accounting papers suggest benefits and implementation ability are not linked. For example, we test whether a firm's *ex-ante* expectations of benefits is related to implementation, finding no evidence of such a correlation (Table 6). Additionally, Leuz and Verrecchia (2000) study a sample of German firms that adopted US or IAS GAAP, and report evidence consistent with the firms receiving benefits through reductions in information asymmetry. However, their sample firms traded on the Neuer Market, which was subsequently disbanded due to fraud, suggesting that these firms received benefits without proper implementation.<sup>18</sup> In summary, all of these arguments are consistent with our sample being subject to self-selection but not self-selection *bias*.

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<sup>18</sup> Glaum and Street (2003) study German Neuer Market firms and find a high degree of non-compliance with IAS and USGAAP. Similarly, untabulated analysis within our sample finds the German firms have an extremely low

(2) *Research design to mitigate self-selection biases*

Notwithstanding the above arguments regarding reasons to expect that the decision to adopt US GAAP is uncorrelated with the ability to implement US GAAP, our research design deliberately addresses concerns of self-selection bias. First, we employ a matched sample design based on factors that we expect *ex ante* to be correlated with implementation ability, including country, industry and firm size. To the extent these variables effectively capture unobserved implementation abilities, they mitigate self-selection bias. Our approach is consistent with economics and corporate finance literature, in which use of matched samples are “methods *du jour* in the most recent applications” (Li and Prabhala 2006).<sup>19</sup> Second, many of our tests employ a changes methodology, where the firm serves as its own control (Table 3). Our ‘before’ and ‘after’ tests are longitudinal analyses, which have been shown to be a useful methodology for mitigating possible effects of self-selection bias (Robinson 1989).

(3) *Useful evidence even with self-selection bias*

Finally, even if our research design was plagued by unspecified self-selection biases, it is useful to consider whether our results might still provide evidence useful to the literature. Although researchers are frequently concerned with the impact of biases on generalizability of results, there is merit in understanding the ability of our sample firms to implement US GAAP.<sup>20</sup> Within the international accounting literature, prior research suggests that cultural factors will prevent globally comparable financial statements under a single set of standards (Ball, Robin and

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compliance with implementation. Conditional on the sample overlap with Leuz and Verrecchia (2000), this provides further evidence that benefits and implementation are not linked.

<sup>19</sup> Lai and Prabhala (2006) argue that matching is being used due to its simplicity, ease of interpretation, and the minimal specification structure required. They correctly point out a trade-off that matching also requires a strong assumption that unobserved economic information is irrelevant. While a properly implemented two-step model may allow for modeling of some limited subset of unobserved information, a review of the economics literature indicates that practical implementation of such models has generally met with mixed success (Lewis 1986, Heckman 1990, Robinson 1989). In fact, such adjustments possibly result in inconsistent estimates and perhaps create a separate bias. These issues may be even more pronounced in an accounting setting, particularly one that involves voluntary disclosure (Larcker and Rusticus 2005).

<sup>20</sup> As an example from the economics literature, in discussing the possible self-selection bias in the context of examining wages and unionization, Heckman (1990, p. 314), points out that “It is also interesting to know what is the effect of unionism on the unionized.”

Wu 2003).<sup>21</sup> That literature implies that even within a group of self-selected GAAP adopters from varying cultural backgrounds we would not find an increase in the comparability of financial statements. However, we find increased comparability in many aspects of accounting. Additionally, within-sample cross-sectional tests (Table 4) provide evidence that regulatory oversight is one means of generating better implementation. All of these findings provide evidence useful for assessing the potential outcomes of firms from varying economic, political, and cultural backgrounds adopting a single set of accounting. Relative to prior literature, our results indicate a very different, and more positive, view of the potential for an international set of accounting standards. If one believes some self-selection bias exists, the ability to generalize these within sample findings depends on the *ex ante* abilities of non-adopting firms to implement a new set of standards and on the perceived level of bias remaining after our matched-sample research design. If one believes the majority of firms will make reasonable efforts to implement some set of globally accepted set of accounting standards, then our results provide evidence that such international standards would increase the comparability of financial statements. Indeed, with the advent of any globally accepted set of accounting standards, the infrastructure of accountants and implementation guidance would surely increase as well, implying that our results are not an upper bound on the implementability of non-local accounting standards. However, if one believes that firms lacking current incentives to adopt also lack abilities to properly implement a set of non-local accounting standards, then our results provide only limited generalizability.

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<sup>21</sup> Prior literature in this area has relied primarily on entire countries with “similar” accounting standards or regulatory reconciliations provided by cross-listing firms. In neither situation are the firms actually attempting to implement an identical form of GAAP, making it difficult to interpret observed differences to a true inability versus remaining differences in accounting regimes (Holthausen 2003).

**Appendix 2**  
**Classification of Accounting Practices as Consistent/Inconsistent with US GAAP**

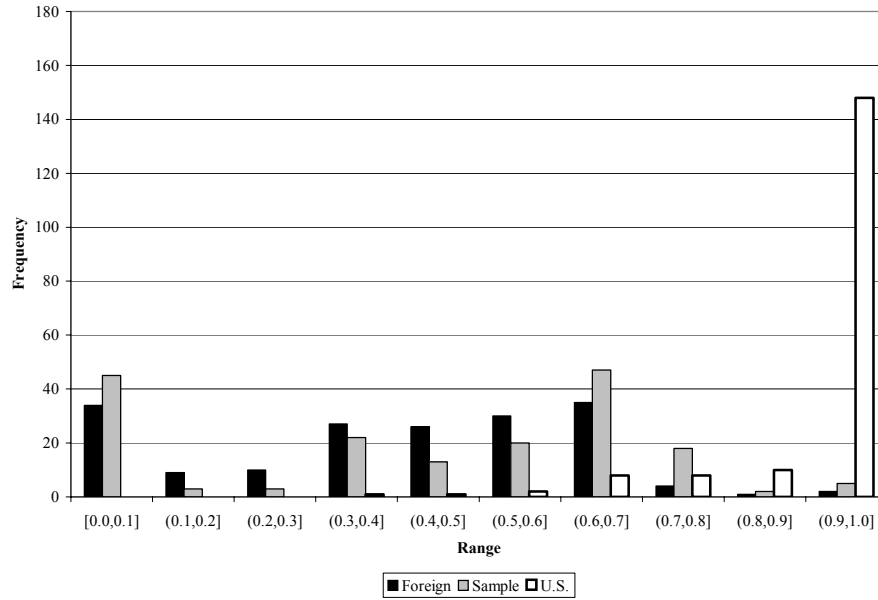
	<i>US GAAP?</i>		% US Firms Disclosing Compliant Practice
	<i>Compliant</i>	<i>Not compliant</i>	
1. Accounting for goodwill	<ul style="list-style-type: none"> <li>• Amortized</li> <li>• Amortized and/or taken to reserves</li> </ul>	<ul style="list-style-type: none"> <li>• Not amortized, expensed when incurred</li> <li>• Written off at management discretion</li> <li>• Taken to reserves</li> </ul>	99.9%
2. Accounting for other intangibles/deferred charges	<ul style="list-style-type: none"> <li>• Amortized</li> </ul>	<ul style="list-style-type: none"> <li>• Capitalized, not amortized</li> <li>• Expensed when incurred</li> <li>• Capitalized, written off at management discretion,</li> <li>• Taken to reserves</li> </ul>	99.9%
3. Accounting for long term financial leases	<ul style="list-style-type: none"> <li>• Capitalized and amortized</li> </ul>	<ul style="list-style-type: none"> <li>• Expensed</li> <li>• Some capitalized and some expensed</li> </ul>	99.7%
4. Accounting method for long term investments less than 20%	<ul style="list-style-type: none"> <li>• Cost</li> <li>• Lower of cost and intrinsic value</li> </ul>	<ul style="list-style-type: none"> <li>• Equity</li> <li>• Market value</li> </ul>	99.7%
5. Accounting method for long term investments 21-50%	<ul style="list-style-type: none"> <li>• Equity</li> <li>• Equity but consolidated where significant influence</li> <li>• Equity and cost depending on significant influence</li> </ul>	<ul style="list-style-type: none"> <li>• Cost</li> <li>• Cost but consolidated where significant influence</li> <li>• Equity and proportional consolidation</li> </ul>	99.8%
6. Accounting method for long term investments greater than 50%	<ul style="list-style-type: none"> <li>• All subsidiaries are consolidated</li> <li>• Consolidation for significant subsidiaries - others are on an equity</li> </ul>	<ul style="list-style-type: none"> <li>• Domestic subsidiaries consolidated - others on a cost basis</li> <li>• Domestic subsidiaries consolidated - others on a equity basis</li> <li>• Foreign subsidiaries consolidated - others</li> </ul>	94.3%

		<ul style="list-style-type: none"> <li>• basis</li> <li>• Consolidation for significant subsidiaries, others are on a cost basis</li> </ul>	<ul style="list-style-type: none"> <li>• on a cost basis</li> <li>• Foreign subsidiaries consolidated - others on a equity basis</li> <li>• No consolidation - cost basis (parent company only)</li> <li>• No consolidation - equity basis (parent company only)</li> <li>•</li> </ul>	
7. Deferred taxes recorded	<ul style="list-style-type: none"> <li>• Yes</li> </ul>		<ul style="list-style-type: none"> <li>• No - taxes paid as incurred</li> </ul>	100.0%
8. Financial statements cost basis	<ul style="list-style-type: none"> <li>• Historical cost entirely</li> <li>• Historical cost with price-level adjustment or revaluation of specific accounts</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Historical cost with supplementary current cost financial information</li> <li>• Current cost statements entirely</li> <li>• Modified historical cost with supplemental current cost financial information</li> <li>• Current cost with supplemental historical cost financial information</li> </ul>	100.0%
9. Funds definition on statement of changes in financial position	<ul style="list-style-type: none"> <li>• Cash</li> <li>• Modified cash</li> <li>• Prior to 1989, other definitions acceptable under APB 19</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Working capital</li> <li>• Modified working capital</li> <li>• Unique definition</li> <li>• Net borrowings</li> <li>• Net liquid assets</li> </ul>	86.0%
10. Marketable securities valuation	<ul style="list-style-type: none"> <li>• Lower of cost or market</li> <li>• Historical cost</li> <li>• Subsequent to 1993, current market value and cost with periodic valuation acceptable under SFAS115</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Current market value</li> <li>• Moving average</li> <li>• Weighted average</li> <li>• Periodic average</li> <li>• Cost with periodic revaluation</li> </ul>	99.8%

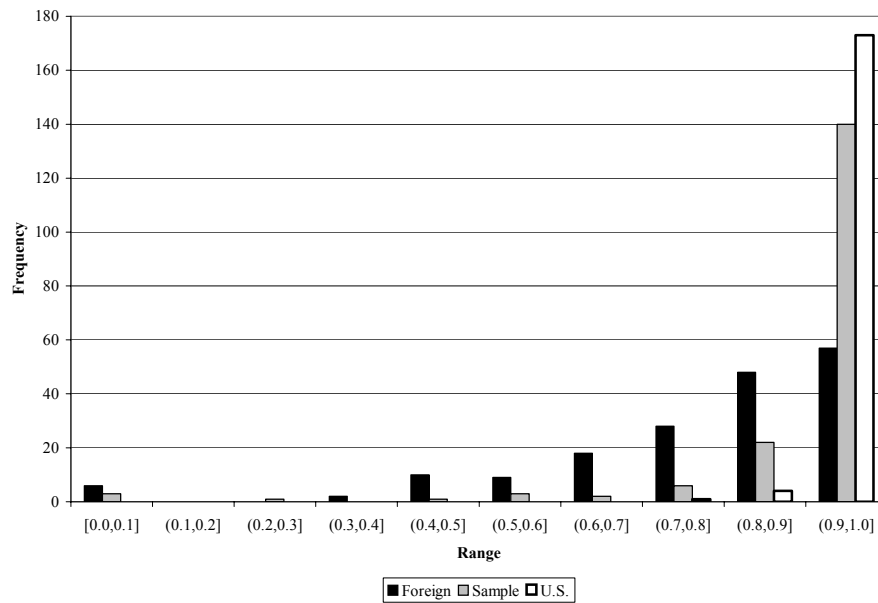
11. Research and development costs	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Expensed currently</li> <li>For computer companies in SIC codes 5054, 7371, or 7372, Capitalized and amortized later or Some expensed some capitalized are considered consistent with US GAAP</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Capitalized and amortized later</li> <li>Expensed and capitalized later</li> <li>Some expensed - some capitalized</li> </ul>	43.4%
12. Starting line of statement of changes in financial position	<ul style="list-style-type: none"> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Net income, bottom line</li> <li>Prior to 1989, Net income before minority interest, Net income before extraordinary items, and other definitions were acceptable under APB 19.</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Net income before net allocations to reserves</li> <li>Net income before minority interest and taxes</li> <li>Unique Sales</li> <li>Sales plus other operating income</li> <li>Operating income</li> <li>Net income before interest</li> <li>Cash receipts</li> <li>Operating income before depreciation etc.</li> </ul>	95.1%
13. Treasury stock location on balance sheet	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Deduction from shareholders' equity</li> </ul>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>Long term investment</li> <li>Other asset</li> <li>Current assets</li> </ul>	99.7%

**FIGURE 1**  
*Distribution of US GAAP Compliance Ratios for Sample firms  
and Matched non-US and U.S. Sample Firms*

**Panel A: RATIO1 Distribution**



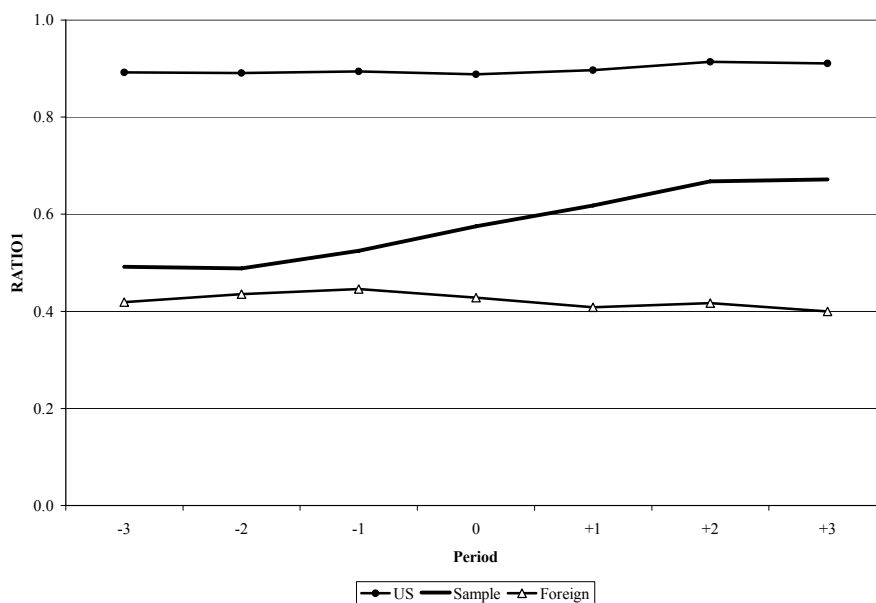
**Panel B: RATIO2 Distribution**



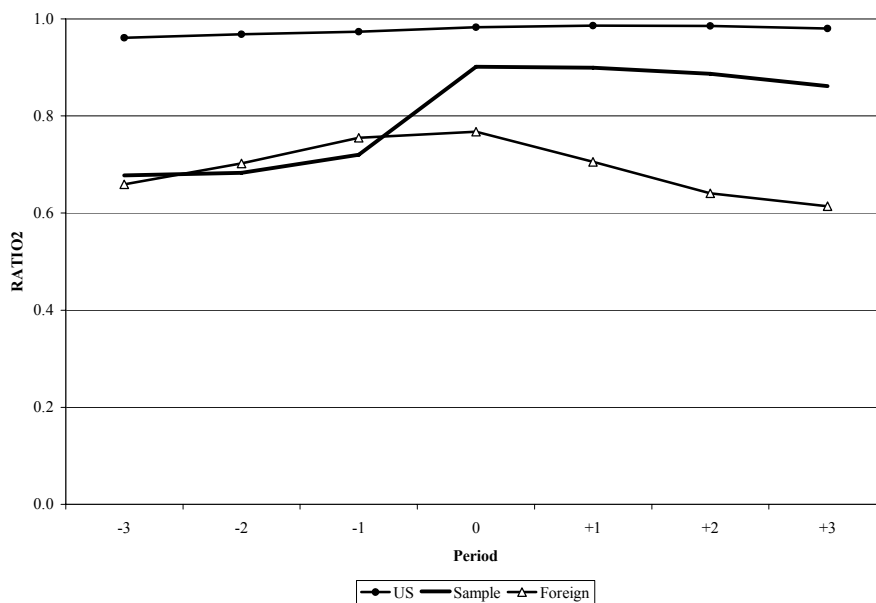
This figure plots means of two ratios of US GAAP compliance for a sample of non-US firms that voluntarily adopt US GAAP and two matched samples of non-US and US firms. The sample size for each sample is 178 firms. RATIO1 is defined as (# of accounting method choices compliant with US GAAP)/13. RATIO2 is defined as (# of accounting method choices compliant with US GAAP)/(# of accounting method choices disclosed for the firm-year observation). See Appendix 2 for a listing of the 13 accounting method choices.

**Figure 2**  
**Time-series Plots of US GAAP Compliance Ratios for Sample Firms**  
**and Matched Foreign and U.S. Samples**

Panel A: RATIO1



Panel B: RATIO2



This figure presents the time-series means of US GAAP compliance ratios surrounding year 0, defined as the initial year of US GAAP adoption by the sample of foreign firms. For a set of matched foreign and U.S. samples, year 0 is defined as the year corresponding to the sample firm to which the firm is matched. Sample sizes are as tabulated in table 4. RATIO1 is defined as (# of accounting method choices compliant with US GAAP)/13. RATIO2 is defined as (# of accounting method choices compliant with US GAAP)/(# of accounting method choices disclosed for the firm-year observation). See Appendix 2 for a listing of the 13 accounting method choices.

**TABLE 1**  
*Distributional and Descriptive Statistics for  
non-US Firms Voluntarily Adopting US GAAP*

**Panel A: Distribution of sample firms by nation**

Nation	N	%	Nation	N	%
Argentina	1	0.6	Japan	36	20.2
Australia	2	1.1	Luxembourg	5	2.8
Austria	4	2.2	Mexico	3	1.7
Belgium	6	3.4	Netherlands	17	9.6
Chile	1	0.6	Norway	5	2.8
Denmark	2	1.1	Peru	1	0.6
France	11	6.2	Russia	2	1.1
Germany	58	32.6	Singapore	2	1.1
Greece	1	0.6	South Africa	1	0.6
Hong Kong	1	0.6	Spain	1	0.6
Hungary	1	0.6	Switzerland	7	3.9
India	2	1.1	U.K.	1	0.6
Israel	3	1.7	Venezuela	3	1.7
Italy	1	0.6			
				178	100.0

**Panel B: Distribution of the first year in which the sample firm reports under US GAAP**

Year	N	%
1980	13	7.3
1981	0	0.0
1982	1	0.6
1983	1	0.6
1984	0	0.0
1985	0	0.0
1986	0	0.0
1987	1	0.6
1988	7	3.9
1989	15	8.4
1990	12	6.7
1991	5	2.8
1992	1	0.6
1993	3	1.7
1994	4	2.2
1995	6	3.4
1996	14	7.9
1997	22	12.4
1998	13	7.3
1999	46	25.8
2000	14	7.9
	178	100.0

This table presents descriptive statistics for the full sample of non-US firms that adopt US GAAP. Panel A presents the distribution of observations by nation. Panel B presents the distribution of observations across calendar years between 1980 and 2000.

**TABLE 2**

*T-statistics (Z-statistics) for tests for differences between means (medians) in compliance ratios across samples in the year of US GAAP adoption by Sample firms*

<b>Means and medians for ratios by sample</b>			
	Sample	RATIO1	RATIO2
Mean	Non-US	0.404	0.788
	Sample	0.446	0.937
	US	0.930	0.990
Median	Non-US	0.462	0.818
	Sample	0.538	1.000
	US	1.000	1.000
<b>T-statistics and Z-statistics for tests of differences in means and medians across samples</b>			
		RATIO1	RATIO2
Sample vs. Non-US	Mean	1.6*	7.4***
	Median	1.7*	8.7***
US vs. Sample	Mean	22.4***	4.3***
	Median	16.1***	4.0***

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This table presents pooled cross-sectional and time-series means and medians of US GAAP compliance ratios partitioned by samples ('Sample' firms, and matched 'non-US' and 'US' samples) for year 0, defined as the initial year in which the sample firm reported under US GAAP. The sample size for each sample is 178 firms. RATIO1 is defined as (# of accounting method choices compliant with US GAAP)/13. RATIO2 is defined as (# of accounting method choices compliant with US GAAP)/(# of accounting method choices disclosed for the firm-year observation). See Appendix 2 for a listing of the 13 accounting method choices utilized to construct the ratios.

\*\*\*, \*\*, \* are significant at the .01, .05 and .10 level, respectively. Tests of the Sample vs. Non-US firms are one tailed. Tests of the Sample vs. US firms are two tailed.

**TABLE 3**  
*Tests for Differences in Properties of Accounting Numbers  
for Sample Firms and Matched non-US and US Firms*

	Non-US (178 firms)	Sample (178 firms)		US (178 firms)
	After	Before	After	After
<b>Panel A: Base Accounting Properties</b>				
Corr(Accruals, Cash flows)	-0.60*** <i>216</i>	-0.79 <i>107</i>	-0.16*** <i>247</i>	-0.23 <i>291</i>
Dechow-Dichev residual $\sigma$	0.042*** <i>184</i>	0.049 <i>84</i>	0.056 <i>211</i>	0.059 <i>277</i>
Variance of $ \Delta$ net income	0.000448*** <i>186</i>	0.000546 <i>90</i>	0.001368*** <i>236</i>	0.007576*** <i>276</i>
<b>Panel B: Conservatism/Timeliness properties</b>				
Frequency of large negative net income	1.8% <i>5/282</i>	0.0% <i>0/125</i>	3.7%** <i>10/274</i>	7.2%* <i>22/305</i>
Skewness of net income	1.24*** <i>282</i>	1.44 <i>125</i>	-2.46*** <i>274</i>	-2.23 <i>305</i>
Basu Return*Dummy coefficient	-0.02 <i>203</i>	0.03 <i>48</i>	0.04 <i>150</i>	0.12 <i>233</i>
Ball-Shivakumar Cash Flow*Dummy coefficient	-0.06*** <i>202</i>	0.03 <i>89</i>	0.49*** <i>233</i>	0.30 <i>277</i>

This table presents univariate tests for differences in various measures of the properties of accounting numbers for the subsample of US GAAP adopters and the non-US and US matched samples. For each subsample, tabulated statistics reflect pooled data from the three-year period preceding ('Before') or subsequent ('After') to the year of US GAAP adoption by the sample firms. All accounting variables are scaled by beginning total assets. Sample size (number of firm-years) is listed in italics below tabulated statistics.

Corr(accruals, cash flows) represents the subsample univariate Pearson correlation between accruals and cash flows. Cash flows are net cash flows from operations, and accruals are computed as the difference between net income and cash flows. Net income is before extraordinary items and preferred dividends. Dechow-Dichev residual  $\sigma$  is the standard deviation of the error terms from the following regression:  $Accruals_t = \alpha + \beta_1 Cash\ flows_{t-1} + \beta_2 Cash\ flows_t + \beta_3 Cash\ flows_{t+1} + \epsilon$ , estimated using pooled cross-sectional data within each sample and period. Variance of  $|\Delta$ net income| is the variance of changes in net income. Frequency of large negative net income is the percent of firm-years reporting net income (scaled) less than -0.20. Skewness of net income reflects the subsample skewness of net income. Basu Return\*Dummy coefficient is the estimate of  $\beta_3$  from the following regression:  $NI_t = \alpha + \beta_1 Return_t + \beta_2 Dummy_t + \beta_3 Return_t * Dummy_t + \epsilon$ , where NI is net income, Return is the annual raw stock return, and Dummy is an indicator variable equal to 1 if the annual raw stock return is negative. Ball-Shivakumar Cash Flow\*Dummy coefficient is the estimate of  $\beta_3$  from the following regression:  $Accruals_t = \alpha + \beta_1 Cash\ flows_t + \beta_2 Dummy_t + \beta_3 Cash\ flows_t * Dummy_t + \epsilon$ , where Dummy is an indicator variable equal to 1 if cash flows are negative. Significance levels reflect tests for differences between non-US and Sample firms (non-US column), Sample firms before and after adoption of US GAAP (Sample-After column), and US and Sample firms (US column). \*\*\*, \*\*, and \* indicate significance levels of 0.01, 0.05, and 0.10, respectively; ‡ indicates that the differences are significant in the opposite direction predicted.

**TABLE 4**  
*Tests for Differences in Properties of Accounting Numbers  
for Sample Firms Conditional on U.S. Regulatory Oversight*

**Panel A: Base Accounting Properties**

	No US listing (96 firms)	US listing (82 firms)
RATIO1	0.56 105	0.62** 171
Corr(accruals, cash flows)	-0.29 92	-0.07* 155
Dechow-Dichev residual $\sigma$	0.064 71	0.049*** 140
Variance of $ \Delta \text{net income} $	0.000722 78	0.001692*** 158

**Panel B: Conservatism/Timeliness properties**

Frequency of large negative net income	4.8% 5/104	2.9% 5/170
Skewness of net income	-1.93 104	-2.96 170
Basu Return*Dummy coefficient	-0.00 41	0.03 109
Ball-Shivakumar Cash Flow*Dummy coefficient	0.53 85	0.46 151

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This table presents univariate tests for differences in various measures of the properties of accounting numbers for the subsample of US GAAP adopters and the non-US and US matched samples. Tabulated statistics reflect pooled data from the three-year period subsequent to the year of US GAAP adoption. All accounting properties variables are as described in the footnotes to table 3. Significance levels reflect tests for differences between Sample firms with and without US listings (US listing column). \*\*\*, \*\*, and \* indicate significance levels of 0.01, 0.05, and 0.10, respectively.

**TABLE 5**

*Analysis of Firm Characteristics of Firms that Voluntarily Adopt US GAAP relative to Matched non-US Firms that Report under Local GAAP*

**Panel A: Univariate Comparison of Explanatory Variables for Sample and non-US Match Firms**

Variable	Means:		Medians:	
	Non-US	Sample	Non-US	Sample
#EXCHANGES	1.81	2.26 ***	1.00	2.00 *
CLOSEHELD	0.28	0.14 ***	0.10	0.00 ***
ABSEXFIN	0.12	0.21 **	0.03	0.06 **
BIG4	0.62	0.83 ***	1.00	1.00 ***
NUMEST	2.67	2.21	1.00	1.00
GROWTH	0.20	0.23	0.10	0.08 *
RD	0.01	0.03 ***	0.00	0.00 ***
ROE	0.10	0.11	0.10	0.11
logMV	19.6	20.7 ***	19.4	20.6 ***

**Panel B: Logit Analysis of Sample and non-US Firms (Dependent variable=[0,1] for [non-US, sample] firms)**

Independent variable	Coefficient
INTERCEPT	-5.47 ***
#EXCHANGES	0.15
CLOSEHELD	-1.87 ***
ABSEXFIN	1.20 **
BIG4	1.01 ***
NUMEST	-0.04
GROWTH	0.48
RD	15.17 ***
ROE	-0.19
logMV	0.22 ***
Likelihood Ratio	91.3 ***
Pseudo R <sup>2</sup>	31.91%

This table presents univariate and logistic analyses of firms that report under their domestic GAAP ('non-US') and non-US firms that choose to report using US GAAP ('Sample'). The sample size is 178 observations per sample. All data except NUMEST is from the Worldscope database. #EXCHANGES measures the total number of exchanges on which the firm trades.

US\_SECURITY is an indicator variable coded as one if the firm has a security that trades in the United States. CLOSEHELD is a percentage measure of the number of shares Worldscope classifies as being held by related entities such as executives of the firms or large block shareholders. ABSEXFIN is the absolute value of the current period external financing transactions of the firm (including both equity and debt), scaled by total assets. BIG4 is an indicator variable coded as 1 if the firm is audited by one of the big 4 accounting firms or their predecessors. NUMEST is the number of analyst estimates in the current year, based on IBES data, and is set to zero if IBES reports no analysts for the company. GROWTH is the current year growth in sales. RD is the current year R&D expense per the financial statements, scaled by total assets. ROE is the current year return on equity, winsorized at +/- 100%. logMV is the log of the end of year market value of equity measured in US dollars. Significance levels reflect t-tests for differences in means and Z-tests for differences in median distribution. \*\*\*, \*\*, and \* indicate significance levels of 0.01, 0.05, and 0.10, respectively.

**TABLE 6**  
*Tests for Differences in Properties of Accounting Numbers  
for Sample Firms Conditional on Predicted Incentive Levels*

**Panel A: Base Accounting Properties**

	Low Incentives (89 firms, mean Pr= 0.42)	High Incentives (89 firms, mean Pr=0.80)
RATIO1	0.55 <i>106</i>	0.63*** <i>170</i>
Corr(accruals, cash flows)	-0.10 <i>91</i>	-0.20 <i>156</i>
Dechow-Dichev residual $\sigma$	0.060 <i>72</i>	0.052 <i>139</i>
Variance of $ \Delta \text{net income} $	0.001703 <i>87</i>	0.001183‡ <i>149</i>

**Panel B: Conservatism/Timeliness properties**

Frequency of large negative net income	4.8% <i>5/104</i>	2.9% <i>5/170</i>
Skewness of net income	-2.85 <i>104</i>	-2.33‡ <i>170</i>
Basu Return*Dummy coefficient	-0.01 <i>57</i>	0.05 <i>96</i>
Ball-Shivakumar Cash Flow*Dummy coefficient	1.07 <i>86</i>	0.37‡ <i>150</i>

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This table presents univariate tests for differences in various measures of the properties of accounting numbers for the sample of US GAAP adopters, partitioned based on the level of capital market incentives computed as the fitted values from the logistic regression in panel B of table 5. Means of Predicted probability (Pr) and RATIO1 are for period 0; other data reflect years subsequent to period 0. Significance levels reflect tests for differences between Sample firms with and without US listings (US listing column). Significance levels reflect tests for differences between subsamples. \*\*\*, \*\*, and \* indicate significance levels of 0.01, 0.05, and 0.10, respectively. ‡ indicates that the differences are significant in the opposite direction predicted.