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## ACCOUNTING STANDARDS AND EARNINGS MANAGEMENT AROUND THE WORLD

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## ACCOUNTING STANDARDS AND EARNINGS MANAGEMENT AROUND THE WORLD

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*This study investigates the relation between accounting standards and earnings management around the world. I find that international accounting standards, accrual-based accounting standards, accounting standards with increased disclosure requirements, and separating tax and financial reporting all constrain earnings management. Following previous studies, I treat accounting standard measures as being endogenous, and use instrumental variables to re-estimate the model. I find consistent results. I conclude that accounting standard policy is an important institution in determining the quality of reported financial information. Different from prior international earnings management studies, I directly test whether international firms are managing earnings using the distribution method. I find evidence that firms are managing reported earnings around the world. I also document that high-quality accounting standards decrease analyst forecast error.*

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Keywords: International earnings management, international accounting standards, accruals, financial disclosure, analyst forecasts, institutions, financial reporting quality, distribution method

### INTRODUCTION

Arthur Levitt (1998), former Chairman of the SEC, says, “I firmly believe that the success of capital is directly dependent on the quality of accounting and disclosure systems.” He defines good accounting standards as those that “produce financial statements that report events in the periods in which they occur, not before, and not after.” However, prior literature tends to argue that high-quality investor protection, strong legal enforcement, and a common law legal system are fundamental determinants of high-quality financial statement numbers. The quality of financial reporting standards are somehow overlooked or treated as secondary.

This paper contributes to a growing literature that examines how a country’s corporate governance model, legal system and the existence and enforcement of laws, and other institutional factors affect the quality of reported financial information. Consistent with Kothari (2000), I argue that the quality of financial information is a function of both the quality of accounting standards and the regulatory enforcement of the standards. My empirical results support this argument. I show that accounting standard policy is an important institutional factor that affects a country’s financial reporting quality, and high quality accounting standards increase financial reporting quality. This effect exists even after controlling for legal enforcement, a country’s economic development, investor protection, and the endogeneity of accounting standard measures.

The definition of the quality of accounting standards is inconclusive. Prior studies tend to focus on transparency when discussing the quality of accounting standards or disclosure systems, and the quality of accounting standards and the quality of accounting information are interchangeably used (Kothari, 2000). In this study, I separate the quality of accounting standards from the quality of reported financial information. Consistent with prior studies (Ball, Robin, and Wu; 2000 and 2003), I agree that a country with high-quality accounting standards does not necessarily have high-quality reported financial information. Different from prior studies, I argue that it is impossible for a country to have high-quality reported financial information if its accounting and disclosure system is of low quality, even though it has strong investor protection and legal enforcement.

Following prior theoretical and empirical research, I assume that an accounting and disclosure system with the following features is of high quality: it has increased disclosure level, it is more accrual-based instead of cash-based, it is more principle-based instead of rule-based, and it should have separated financial reporting and tax reporting systems. I also treat IAS, US GAAP, accounting standards in accordance with Organization for Economic Cooperation and Development

(OECD) guidelines, and Canadian standards as high quality standards; and I use these standards as composite measures to proxy for the quality of accounting standards in this study.

A few recent studies have documented the importance of accounting standards. Hung (2001) studies the relation between accrual accounting and the value relevance of accounting measures in countries with different levels of shareholder protection. She finds that stronger shareholder protection improves the effectiveness of the accrual system. She argues that accrual accounting provides better matching of revenues and expenses than cash accounting and therefore makes accounting information more value relevant. However, accrual accounting also presents more opportunities for managers to manage earnings and hence may cause accounting information to be less value relevant. She predicts that strong shareholder protection will attenuate this negative impact. Hope (2003) investigates the relation between the accuracy of analysts' earnings forecasts and the level of annual report disclosure, and the relation between forecast accuracy and the degree of enforcement of accounting standards. He finds that firm-level disclosures in annual reports are positively associated with analyst forecast accuracy, suggesting that such disclosures provide useful information to analysts. Using a comprehensive measure of enforcement, he finds that strong enforcement is associated with higher forecast accuracy. He concludes that enforcement encourages managers to follow prescribed accounting rules, which in turn reduces analysts' uncertainty about future earnings.

Even though these studies have documented the importance of accounting standard policies, however, few of them directly focus on the relation between the quality of accounting standards and the quality of reported financial information, and none of them test whether and how the quality of accounting standards affects earnings management across countries.

Leuz, Nanda, and Wysocki (2003) investigate how investor protection affects firms' earnings management practices across countries. They find that earnings management is negatively associated with investor protection and legal enforcement. They conclude that investor protection is a fundamental determinant of the quality of reported accounting earnings across countries.<sup>1</sup> The current paper extends their study, and systematically investigates how accounting standards affect earnings management and the quality of reported financial information. According to prior literature, earnings management is defined as disclosure management or accounting number manipulation. Based on these definitions, I argue that accounting standards directly affect disclosure systems and the formation of accounting numbers, and thus affect earnings management and the quality of reported financial information. High-quality accounting standards should constrain managements' discretion in extracting private benefits from other shareholders, and better reflect the underlying economy of a company. I hypothesize that firms in countries with high-quality accounting standards are less likely to manage earnings and thus have better reported earnings.

Using five different proxies for the quality of accounting standards, I find that international accounting standards, accrual-based accounting standards, accounting standards with increased disclosure requirements, and separating tax and financial reporting all constrain earnings management. Following prior studies, I treat my accounting standard measures as being endogenous, and use instrumental variables to re-estimate the model. Again, I find consistent results.

My study complements the international earnings management literature and provides strong evidence that international firms are managing earnings. A few recent international studies link earnings management measures to country-level institutional factors, and analyze how these factors affect international earnings management. The main assumption of these studies is that international firms are managing their earnings using those earnings management measures (Leuz et al., 2003; Haw et al., 2004).<sup>2</sup> I provide evidence that international firms do manage their earnings. I further show that companies in different countries have different incentives to manage reported earnings, and thus have different thresholds. Following DeGeorge et al. (1999) drawing on three psychological theories, I argue that managing earnings against loss, against earnings decrease, and against negative earnings surprise are three common thresholds across countries.

My study complements and extends the findings in Brown and Higgins (2001), which tests whether US managers are relatively more likely to manage earnings surprises than managers in other countries. They find that US managers are relatively more likely than non-US managers to report earnings that slightly beat analyst estimates, and less likely to report

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<sup>1</sup> Leuz et al (2003) acknowledge that accounting rules may limit insiders' ability to manage earnings, and further control for accounting rules measure. They conclude that accounting rules are endogenous, and investor protection is a more fundamental determinant of earnings management across countries.

<sup>2</sup> Leuz et al (2003) use four different measures to measure earnings management under the assumption that there are earnings managements internationally. Haw et al. (2004) explore the relationship between the absolute value of discretionary accruals and the ultimate ownership and legal institutions based on the assumption that discretionary accruals are used by those Asian and European companies to manage their earnings.

earnings that fall short of analyst estimates by a relatively large amount.<sup>3</sup> They conclude that increased emphasis on stock price performance and increased litigation upon stock price drops make US managers become more likely to manage earnings surprises. They suggest that policy-makers aiming at mitigating earnings surprise management in US should reduce information asymmetry by instituting and facilitating disclosures of long-term value-creating activities. Increased disclosure will make investors place less emphasis on current results, and thus reduce the pressure on managers, analysts, and auditors to manage earnings.

Consistent with their prediction, my results show that increased disclosure policy decreases the probability of beating or meeting analyst forecasts. I also find that accrual-based accounting policy and separating tax reporting and financial reporting all decrease the probability of earnings management against analyst forecasts. Furthermore, I find that international firms under IAS or US GAAP or accounting systems close to IAS are more likely to slightly beat analyst forecasts than firms under domestic accounting standards. As prior studies find that international firms engage in expectation management, i.e., downward guidance of analysts, to meet or beat analysts' earnings forecasts, rather than earnings management (Brown and Higgins, 2002); I reconcile my seemingly contradictory results, and argue that results of small positive earnings surprise management are driven by firms' expectation guidance, not earnings manipulation. I believe that managements are more likely to engage in expectation management when earnings managements are constrained by high quality accounting standards. I conclude that my results are consistent: high quality accounting standards decrease earnings management against analyst forecasts.

My testing variables are constructed at both country level and firm level. Prior international studies tend to use measures constructed at country level (La Porta et al., 1998, 2002, and 2006; Leuz et al., 2003). However, for a variety of reasons, such as cross-listing in US or borrowing money from international organizations, firms in a country with low-quality accounting standards might use US GAAP, IAS, or other high quality accounting standards. Consequently, we observe the coexistence of firms with high-quality and low-quality accounting standards in one economy, and this trend is increasing in the past decade. It remains an interesting empirical question whether individual firms adopting high-quality accounting standards can provide high-quality accounting information when their domestic accounting standards are of low quality.

Using the distribution method, this paper directly tests whether international firms are managing earnings to avoid earnings decrease, losses, and to meet or beat analyst forecasts. The only assumption of this method is that the distribution of standardized earnings or change in earnings or analyst forecast errors asymptotically normally distributes without earnings management. The advantage of this method in an international setting is that I can include all available observations into my initial sample, and do not have to place any restrictions for a country to be included in my study. In addition to providing visual evidence with histograms, I construct statistical tests to formally test the null hypothesis.

Durtschi and Easton (2005) argue that discontinuities documented in the earnings management literature using the distribution method are created by the deflator. They point out that there are no discontinuities in the distribution of net income without deflation, and the distribution of earnings per share has opposite results, i.e. there are more observations just below zero than the number of firms just above zero. To address this concern, I use the distribution of net income without deflation and distribution of earnings per share to test the validity of the distribution method in the international setting. I find that distributions of net income and earnings per share are still significantly discontinued, even though Durtschi and Easton (2005) do not find discontinuities using US firms. I conclude that the distribution method appears to be a valid tool in detecting earnings management in the international setting, and the results documented in this study are robust to testing variables with or without deflation.

Two characteristics make this study unique. First, I provide direct evidence that international firms are managing earnings. Second, I directly focus on the quality of accounting standards, and analyze how this institutional factor affects earnings management and the quality of reported financial information. The rest of the paper proceeds as follows. The next section describes the motivation and hypothesis development. Section III discusses the research design. Section IV presents the empirical evidence of international earnings management, and analyzes how accounting standards affect earnings management. Section V discusses and concludes the study.

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<sup>3</sup> In the sensitivity analysis, they also document that British-American accounting system tends to increase the probability of small positive earnings surprise management, and decrease the probability of small negative earnings

## **BACKGROUND AND HYPOTHESIS DEVELOPMENT**

### **A. Evidence of International Earnings Management**

Earnings management is a worldwide phenomenon. Financial Times (June 19, 2004) reports that UK companies are less likely to use aggressive accounting practices to manage their earnings than a few years ago because of changes in the corporate environment. According to preliminary findings by John Collier, a chief executive of the Institute of Chartered Accountants in England and Wales, the threat of aggressive earnings management could increase when financial markets start to heat up again. Many corporate respondents interviewed by Mr. Collier complained the considerable pressure that companies remained under to meet market expectations for fear of being labeled “unreliable” by analysts. Bonuses are also cited as a cause of aggressive earnings management. In September 1998, UK accounting standard Setters banned the use of provisions as a profit manipulation device. *The Accountant* (November 1, 1998) reports this event with an article titled “Standard-setter bans ‘big-bath’ accounting”. By depressing profits in good years and bumping up bottom lines when times are bad, over-generous provisions are a classic creative accounting device for smoothing earnings. UK companies made huge provisions for future reorganizations, and later on fed those provisions back into income.

When German car giant Daimler-Benz switched to US standards in 1993, it reported heavy losses. In its half-year results, Daimler-Benz reported a profit of \$67.8 million under German accounting rules; while under US GAAP, the group reported a massive loss of \$383.3 million. At the same time, German finance minister Theo Waigel said he would lobby US Treasury Secretary Lloyd Bentsen for the recognition of German accounting standards in the New York capital markets. *Accountancy Age* (Sept. 30, 1993) observes that the difference stems from reserves and provisions that German companies use to smooth profits between boom and slump periods.

While US accountants have long been under fire for giving in pressure from their clients to cook the books, Tomita, the founder of one of the largest audit corporations in Japan, claims that the system in US is far better than that in Japan (*Accounting Today*, February 9, 1998). Tomita says that Japanese firms appear to comply with the law by hiring outside auditors. However, there are quite a few cases in which this so-called outside auditor comes from a related company or is an officer from the corporation’s main bank. He criticizes that Japanese firms always attempt to cover whenever there are losses. For example, auditors have allowed mortgage companies to wait more than five years to write off questionable or devalued assets. An article in *The Accountant* (May 20, 2003) reports that Japanese government finally appears to be acknowledging that Japanese balance sheets seriously lack transparency. It is now desperately trying to push through legislation aimed at preventing collusive practices between companies and their auditors. Rie Ota, financial analyst at HSBC securities in Tokyo observes, “How many times have I come across companies that on paper look just fine, yet are discovered to be completely debt ridden on closer examination?”

An article in *Corporate Finance* (October 2, 1999) mentioned that David Brown, chairman of the Ontario Securities Commission, says CEOs are inflating their quarterly earnings results and, as a result, eroding confidence in Canada’s stock markets. He told corporate boards of directors and audit committees to crack down on creative accounting practices. This article comments that Canadian accounting standards are less detailed than their US equivalent, allowing greater scope for interpretation and for bending the rules. In recent years theater group Livent and waste metal company Philip Services have been forced to restate several years of financial accounts following abuses of market practices.

Tim Lincoln, managing director of specialist financial risk management company Lincoln Indicators, says “Australia is a world leader in continuous disclosure and company reporting guidelines, but creative accounting still slips through the net”. Mr. Lincoln comments that it is rare to see companies capitalize expenses directly nowadays, but you still see companies overvalue assets, overstate cash flow and understate debt levels. Wherever they can, companies always stress the highest percentage increase they have to offer, whether in earnings before interest, tax, depreciation and amortization; earnings before interest and tax; pre-tax profit; net profit after tax before significant items; or net profit after tax (*Sunday Mail*, August 17, 2003).

Some international companies go beyond aggressive earnings management, and use fraudulent practices. *Agence France Presse* (May 11, 2004) reports that Singapore police are investigating Synergy Construction, a bankrupt Singapore government-linked construction company, for allegedly deliberately hiding substantial losses from its shareholders. Singapore is a nation that enjoys a reputation for having one of the cleanest corporate environments in the world. At the same

time, two Singapore education companies, Auston and Informatics, were caught for accounting irregularities. Auston admitted that its financial results for the past two years have been overstated. Media comments that Auston has a problem of cost recognition, and Informatics was booking in its revenue too aggressively. Financial Times (December 5, 2003) reports that Erb group, one of Switzerland's most successful companies, has hidden massive losses, putting up to \$1.5 billion of credits at risk. Switzerland's two biggest banks, UBS and Credit Suisse, are Erb's biggest creditors.

## B. Incentives of Earnings Management and Thresholds

Different countries have different incentive to manage earnings, and thus have different thresholds. While the US corporate governance system is characterized as market oriented, the Japanese system is usually characterized as bank and relationship oriented. The difference leads to the argument that whether Japanese firms maximize growth or market share rather than profits or share price. Aoki (1990) and Kester (1991) argue that Japanese managers must earn enough profit to satisfy their banks and meet debt payments. Otherwise, they will be removed. Kaplan (1994a) finds that top executive turnover and compensation in Japan are more sensitive to negative earnings than in the United States, indicating the active role of main banks in monitoring managements. Kang and Shivdasani (1996) find that the probability of forced president turnover in Japan increases with poor firm performance. Habib (2002) argues that many Japanese banks now could not afford lending enough money to companies after the bubble burst because of the damage they suffered from the collapse. Managers started looking to the capital market for necessary finance, and this change makes earnings figure become very important. The lift of the ban on stock option in 1997 also provides strong incentive for managers to manage earnings to meet or beat analyst forecasts, as analyst forecasts play an important role in determining the stock price.

Germany's corporate governance system is also characterized as bank and relationship oriented. Kaplan (1994b) finds that the turnover of the management board in Germany increases significantly with poor stock performance and particularly poor earnings. Managers are approximately twice as likely to lose their jobs in a year with a loss as in a year with positive earnings. Harris et al. (1994) show that German accounting system provides management incentive to manage reported earnings. They show that German stock corporation law prevents management from retaining more than half of the net income for the year. It leaves the remaining profit and certain retained earnings to the discretion of shareholders at the annual meeting. They conclude that this link between earnings and dividends creates incentives for management to manage reported earnings, as higher reported earnings may create higher pressure for higher dividends. Strong labor unions also make German companies hesitant to report high earnings for fear of strengthening labor's hand in negotiations.

Chen and Yuan (2004) reports that listed companies in China were required to achieve a minimum return on equity of 10 percent in each of the previous three years before they could apply for permission to issue additional shares. As a result of this rule, there was a heavy concentration of return on equity in the area just above 10 percent. They further show that about one quarter of listed firms reported an ROE between 10 and 11 percent in 1997. Chen et al. (2002) argue that the controlling shareholders of listed companies in China are either state-owned enterprises or government agencies. Both entities evaluate management of their listed companies based on reported earnings. The tenure, promotion, and political future of top management depend on earnings performance in the eyes of controlling shareholders. In addition, security regulations contain profitability targets that govern the eligibility for raising additional capital or determining delisting, both of which create strong incentives for earnings management.

DeGeorge et al (1999) argue that executives focus on thresholds for earnings because the parties concerned with the firm's performance care about these thresholds. They argue that threshold mentality arises from at least three psychological effects. First, there is something fundamental about positive and non-positive numbers in human thought process. Meeting this focal point is critical relative to beating it by 10% or falling short by 3%. Second, prospect theory indicates that individuals choosing among risky alternatives behave as if they evaluate outcomes as changes from a reference point. Third, people depend on rules of thumb to reduce transactions costs. The discreteness of actions demands the use of thresholds to evaluate acceptable performance.

Based on the first psychological effect, I argue that positive earnings, positive change in earnings relative to last period earnings, and positive change relative to analyst forecast are important thresholds. Based on the second effect, I argue that zero point, last year's earnings, and analysts' forecasts are the most direct and obvious reference points. Based on the third effect, I argue that positive earnings, beating last period's earnings, and beating analysts' forecasts are three basic measures used to gauge acceptable performances. Together I argue that these three thresholds are common in human society across countries.

### C. Quality of Accounting Standards and Reported Earnings

Few empirical studies directly investigate the relation between the quality of accounting standards and the quality of reported financial information. Accounting rules are generally treated as endogenous variables (La Porta et al., 1998; Leuz et al., 2003) in empirical studies, and results are mixed.

Ashbaugh and Pincus (2001) study whether the variation in accounting standards across national boundaries relative to IAS affects the ability of financial analysts to forecast non-U.S. firms' earnings accurately. Using a sample of 80 non-U.S. firms that adopted IAS during 1990-1993, they find that differences in countries' measurement and disclosure standards relative to IAS are positively associated with analyst earnings forecast errors. They also document that the absolute value of analyst forecast errors decreases following firms' adoptions of IAS. They conclude that differences in reporting standards across countries relative to the benchmark of IAS affect the ability of financial analysts to accurately forecast international firms' earnings. They argue that the variation in measurement and disclosure practices is reduced following the adoption of IAS and hence firms' financial information becomes more predictable.

Ball et al. (2003) study the influence of the incentives of managers and auditors on the properties of reported accounting numbers under high quality of accounting standards. However, they find that earnings reported in the four East Asian countries exhibit properties similar to code law accounting, even though these countries have common law standard setting and their recent standards closely resemble International Accounting Standards. They conclude that auditor and manager incentives influence choice among accounting standards, and thus the quality of reported earnings.<sup>4</sup>

In order to reconcile these contradicting empirical results regarding the relation between the quality of accounting standards and the quality of reported financial information, I link accounting standard quality measures to earnings management measures. Based on the definitions of earnings management in the literature, I make two arguments why high quality accounting standards constrain earnings management, and thus provide high-quality reported financial information.

First, accounting standards directly affect financial disclosure, and affect information asymmetry. Schipper (1989) defines earnings management as "disclosure management in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain". Information asymmetry exists between managers and parties contracting with the firm, including shareholders, lenders, suppliers, customers, and employees. Ball (2001) argues that an efficient system of public financial reporting and disclosure ameliorates information asymmetry. Accounting standards directly impose the financial disclosure requirements. International accounting standards and other high quality accounting standards require firms to disclose more information to the outside investors. This increased disclosure requirements will increase the transparency of firms' financial performance, decrease information asymmetry between insiders and outsiders, and thus decrease the discretion of a management's earnings management behaviors.

Second, accounting standards directly affect the formation of accounting numbers, which might be used by management for earnings management purposes. Higher quality accounting standards should reduce managers' discretion in manipulating these numbers. Previous studies show that earnings management is accounting manipulation. Healy and Wahlen (1999) define earnings management as "subjectively altering financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers". They further argue that accounting standards can provide a relatively low-cost and credible means for corporate managers to report information on their firms' performance to external capital providers and other stakeholders. Accounting standards stipulate the rules and guidance in calculating those accounting numbers, and thus directly affect earnings management behavior. Efficient accounting standards should reduce a management's behaviors in extracting private benefits from other shareholders and stakeholders, better reflect a company's underlying economy, and facilitate efficient resource allocation. For example, US GAAP requires managers to use judgments and assumptions to faithfully report their firm's performance, and at the same time provides manages flexibilities to manage accounting numbers. However, it does not mean that managers have unlimited discretion in manipulating these numbers. Accounting regulators, such as SEC, FASB, and AICPA, provide detailed rules and guidance for measurement, recognition, and disclosure.

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<sup>4</sup> I argue that these four countries might not be able to represent the average effect of implementing high quality accounting standards on reported earnings. Their results are not surprising if we treat these countries as outliers statistically. However, studies based on small sub-samples of a few countries also help us understand the relation between accounting standards and reported accounting numbers.

Based on the above arguments, I posit that international accounting standards or high quality accounting standards constrain earnings management, and provide high-quality reported financial information. My first hypothesis regarding the relation between accounting standards and earnings management of meeting or beating benchmarks stated in the alternative form is:

**H<sub>1</sub>:** *High quality accounting standards constrain earnings management against benchmarks.*

Matsumoto (2002) shows that firms could engage in expectation management, i.e., downward guidance of analysts, to meet or beat analysts' earnings forecasts, rather than earnings management. Brown and Higgins (2002) investigate whether managers around the world guide analysts' earnings forecasts downwards. They find that U.S. managers guide analysts' forecasts downwards relatively more than managers do in other countries, and downward guidance of analyst forecasts has increased temporally around the world. They show that guidance increases with strong investor protection, with the richness of the firm's information environment, and with managers' incentives and ability to guide analysts. They conclude that strong investor protection mitigates management of reported earnings, and fosters guidance to enable managers to achieve their goals of meeting or beating analyst estimates.

As management could engage in either expectation management or earnings management, my earnings management measure of beating analysts' earnings forecasts is endogenous. In order to deal with this endogeneity problem and provide more intuitive results, I construct another measure, analyst forecast error, to test the relation between the quality of accounting standards and reported financial information. I argue that high-quality accounting standards should provide high-quality accounting information, which reduces uncertainty and information asymmetry and thus reduces analyst forecast error. My second hypothesis regarding the relation between accounting standards and analyst forecast error stated in the alternative form is:

**H<sub>2</sub>:** *High-quality accounting standards provide high-quality reported financial information, and thus reduce analyst forecast error.*

## RESEARCH DESIGN

### A. Measuring International Earnings Management

Leuz et al. (2003) use the ratio of the number of small profit firms to the number of small loss firms as a measure of earnings management. They argue that the ratio reflects the extent to which insiders manage earnings to avoid reporting losses. Although this measure might capture earnings management, it might be flawed. As we know, the shape of normal distributions is determined by the sample mean and sample variance. When the sample variance is very small, the shape of the normal distribution is very steep. In this case, the ratio of the frequency of firms in the first interval to the right of a benchmark to the frequency of firms in the first interval to the left of the benchmark might be very big, depending on where the benchmark is. Earnings management might not exist, if the curve is smooth and there is no discontinuity. Similar problems associated with other earnings management measures. For example, we do not know how high the normal level of discretionary accruals under certain country-specific institutions should be when we can claim that there is earnings management, as we do not have reliable benchmarks.

In order to control for the endogenous problems associated with earnings management measures, I follow Burgstahler and Dichev (1997) and DeGeorge et al. (1999) and use the distribution method to measure earnings management. As the only assumption of this method is that the standardized earnings or change in earnings follow normal distribution, it might more precisely capture earnings management in the international setting. Following prior literature, I argue that each firm has only one true value of Hicksian income during each accounting period regardless of Japanese or German firms. Earnings numbers generated under high quality accounting standards should be close to this true value. In the absence of institutional factors, including country-specific accounting standards, the Hicksian income should asymptotically normally distribute. If we assume that these values are transformed through a linear function after the imposing of institutional factors, these earnings numbers should also normally distribute. If firms intentionally manage their earnings to avoid or beat certain benchmarks, I expect that the smoothness of the distribution will be disrupted.

Following Burgstahler and Dichev (1997), I construct t-like statistics to formally test the distributions of standardized earnings, change in earnings, and analyst forecast errors. I use the average of the probability of interval  $i$  and the



probability of interval  $i+1$  as the expected probability of interval  $i$ . The intuition is from the relation between the cumulative distribution function and the probability density function,  $F(x) = f(x)$ . The probability of  $X$  is changing throughout the distribution. When I use the average probability of interval  $i$  and interval  $i+1$  as the expected probability of interval  $i$ , I capture the change of the distribution. Operationally, the distribution is formed by intervals of the width of 0.005 or 0.0025, so I use the average number of observations in interval  $i$  and interval  $i+1$  as the expected frequency for interval  $i$  to account for the variation of the distribution.<sup>5</sup>

I assume homoscedasticity across the distribution under the null hypothesis of no earnings management. My definition of smoothness is that the relative variation of the distribution is constant across the whole truncated distribution. If there is earnings management around certain benchmarks, I expect that the constant variation of the distribution will be disrupted. I predict that the relative variation will be much bigger around those benchmarks compared with variation across the rest of the curve. Operationally, when I detect a discontinuity in the distribution, I recalculate the variance after subtracting the discontinued interval, and retest the distribution using this newly formed standard error. I repeat this process until there are no discontinued intervals. I believe this reiterated method will increase the precision of the t-like statistics.<sup>6</sup>

Previous studies use the assumption of symmetry in estimating the number of firms managing earnings. The challenge of this method is to locate the mean of the distribution under the scenario of no earnings management. In reality, we only see the asymmetric distribution, and only know the ex post mean, the mean of the distribution formed after earnings management behaviors have already happened. There is no way to find out where the ex ante mean is under the scenario of no earnings management. So even though we assume that distributions of standardized earnings, change in earnings, and analyst forecast errors symmetrically normally distribute, we have to estimate ex ante mean. I have tried different methods to estimate the ex ante mean. Here I use the ex post median of the distribution as the ex ante mean. The intuition is that earnings management behaviors normally happen under certain restrictions. For example, the change of accounts receivable will affect other accrual accounts, and thus constrain management's discretion. Management can only manage reported earnings within GAAP and other legal restrictions. It is hard for managements to manage earnings beyond certain thresholds. If we assume that the ex ante mean and median are above zero; earnings management to avoid losses and earnings decrease and to beat analyst forecasts may not affect the median. Put it in another way, I assume that the ex post median is the same as the ex ante median. Earnings management only affects the distribution mean but not median; although the median might be affected by Big Bath or Reining-In behaviors. I trim the data 2% when I estimate the median. Results are reported in the following section.

## B. Direct Estimation of Probit Model Assuming No Endogeneity

I use a probit model to analyze the relation between earnings management and accounting standards. I code firms in those discontinued abnormally high intervals as one, and those in the discontinued abnormally low intervals as zero. The assumption is that the over-represented small earnings interval implies earnings management relative to the under-represented groups that are assumed not to have managed earnings. I use probit model to analyze how my testing variables, accounting standard proxies, affect the likelihood of firms in those discontinued areas.

The international setting provides a unique opportunity to evaluate accounting standards. I use five proxies to test the hypothesis.<sup>7</sup> The first proxy is international accounting standard. This is a firm-level variable. I predict that a firm is less likely to manage its earnings if it uses international accounting standards or US accounting standards. International accounting standard normally requires firms to disclose more information to the investors, and thus increase the transparency of firms' financial performance. The increased transparency will constrain management's earnings management behavior. Based on the categories of accounting standards in Global Vantage, I define the following accounting standards as international accounting standards: 1) domestic standards generally in accordance with International Accounting Standards Committee (IASC) and Organization for Economic Cooperation and Development (OECD) guidelines; 2) domestic standards generally in accordance with IASC guidelines; 3) Domestic standards generally in accordance with OECD guidelines; 4)

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<sup>5</sup> Alternatively, I follow DeGeorge et al. (1999), and use  $f'(x_n)$  as the change of the probability from interval  $i$  to interval  $i+1$ . I calculate the expected mean of the change across the distribution, assuming the expected change converges to a constant. I also simulate normal distribution. I partition the simulated sample, and use the simulated frequency for interval  $i$  as the expected frequency for that interval. I believe the method used here is the optimal one.

<sup>6</sup> Appendix A provides more detailed discussion on how the formal statistical test is constructed.

<sup>7</sup> I am also interested in testing the difference of principle-based versus rule-based accounting standards in constraining earnings management. Unfortunately, there are no country-level measures available.

domestic standards in accordance with principles generally accepted in the United States; 5) domestic standards generally in accordance with United States GAAP; 6) United States' standards; and 7) Canadian accounting standards.

The second proxy is accrual-based accounting standards versus cash-based accounting standards (Hung, 2001). Accrual index represents the degree to which the accounting system moves away from a cash method measure of performance. A higher index value indicates higher use of accrual accounting. This index is created by rating 11 items. Each item is equally weighted. 1) Whether goodwill is capitalized; 2) whether equity method is required; 3) whether additional accelerated depreciation is allowed; 4) is purchased intangible capitalized; 5) is developed intangible capitalized; 6) is R&D expenditure capitalized; 7) is interest capitalized; 8) is finance lease capitalized; 9) is percentage of completion allowed; 10) are future pension costs accrued; 11) whether other post-retirement benefits are accrued. As accrual-based accounting standards are considered high quality accounting standards, I predict that accrual-based accounting standard will decrease earnings management.

The third proxy is tax-book conformity index. As tax rules can be very influential on financial accounting measurement, separating financial reporting from tax reporting purposes increases the precision of reflecting underlying economic reality. This index is also from Hung (2001). It measures the convergence between tax reporting and financial accounting. It equals 1 for countries with high tax-book conformity and equals 0 for countries with low conformity.<sup>8</sup> It is constructed by examining six items: 1) average consensus estimate of the relation between tax and financial reporting; 2) whether deferred taxes exist; 3) whether legal form dominate substance; 4) whether additional accelerated depreciation allowed; 5) whether amortization periods depend on tax laws; 6) whether lease capitalization depend on tax law. As separating tax reporting and financial accounting is more sophisticated, I predict that separating tax and financial reporting will constrain earnings management.

The fourth proxy is disclosure index based on La Porta et al. (1998). This index covers general company information, income statements, balance sheets, funds flow statement, accounting standards, stock data and special items. It is created by examining and rating companies' 1990 annual reports on their inclusion or omission of 90 items. It is a more comprehensive index. A minimum of 3 companies in each country were studied. The companies represent a cross-section of various industry groups where industrial companies numbered 70 percent while financial companies represented the remaining 30 percent. I predict that firms in countries with higher disclosure index are less likely to manage their earnings.

The fifth proxy is international accounting standard convergence index constructed by Francis, Khurana, and Pereira (2004). Convergence index is solely based on the agreement between international accounting standard and domestic accounting standards. A higher index indicates that the domestic accounting standard is closer to international accounting standard. Two sub-indices, disclosure requirements index and recognition restrictions index, are constructed by equally rating 60 items from GAAP 2000 to capture similarities between domestic accounting standards and international accounting standard. The index used in this paper is the sum of these two sub-indices. The international accounting standard measure is different from this convergence index in that it captures the individual firms adopting higher quality accounting standards within each country, and in that it compares accounting standards directly at the firm level across the world. Similar to my first proxy, I predict that firms in countries with higher convergence index are less likely to manage their earnings.

La Porta et al. (1997) show that legal rules and the quality of law enforcement determine the development of capital markets. Leuz et al. (2003) constructed combined legal enforcement index by averaging three legal variables from La Porta et al. (1998): 1) the index measuring the efficiency of the judicial system, 2) the index assessing the rule of law, and 3) the corruption index. They use this combined index as a control in their multiple regressions in testing whether their investor protection measure constrains earnings management. Following these previous studies, I use the combined legal enforcement index as a control in my model. I also use 2001 logGDP per capital as an additional control for economic development. Specifically, I estimate the following probit model with clustered robust standard errors to correct for heteroscedasticity and serial dependence:

$$\text{PROBIT [EM=1]} = f(\beta_0 + \beta_1 \text{AccountingProxies}_i + \beta_2 \text{Legal}_i + \beta_3 \text{LogGDP}_i + \epsilon_i) \quad (1)$$

<sup>8</sup> Haw et al. (2004) find that a higher rate of tax compliance subdues the effects of the other extra-legal institutions in curbing earnings management, and the effects are even greater than legal tradition and the efficiency of the judicial system. This finding is not in contrast to my findings, as the tax compliance variable is defined differently (see Dyck and Zingales, 2004).

Where:

- EM = earnings management measure. Firms in those discontinued abnormally high intervals are coded as one, and those in the discontinued abnormally low intervals are coded as zero;
- AccountingProxies = five proxies for accounting standards, i.e. international accounting standards, accrual-based accounting, tax-book conformity index, disclosure index, and international accounting standard convergence index;
- Legal = legal enforcement, the average of three legal variables: the judicial efficiency index, the index of the rule of law, and the corruption index; and
- LogGDP = log transformation of 2001 GDP per capita.

Leuz et al. (2003) argue and find that investor protection constrain earnings management internationally. In order to make my results comparable with those documented in prior studies, I further control for investor protection, and estimate the following probit model with clustered robust standard errors:

$$\text{PROBIT [EM=1]} = f(\beta_0 + \beta_1 \text{AccountingProxies}_i + \beta_2 \text{Protection}_i + \beta_3 \text{Legal}_i + \beta_4 \text{LogGDP}_i + \varepsilon_i) \quad (2)$$

Except for investor protection, variables are defined as in equation (1). Even though Leuz et al. (2003) argue that investor protection constrains earnings management, they only use anti-director right as a proxy for investor protection. As La Porta et al. (1998) define investor protection as shareholder rights and creditor rights, I use the sum of anti-director rights and creditor rights as my investor protection measure. The theoretical range of this measure is from zero to ten.

#### C. Joint Estimation of Probit Model with Endogenous Variables

In the previous section, I directly estimate the probit model, assuming that there are no endogeneity problems with accounting standard measures. However, previous studies show that there might be endogeneity problems associated with institutions. Leuz et al. (2003) treat investor protection measure as an endogenous variable. They use legal origins and economic development measure as instrumental variables to re-estimate their model. La Porta et al. (2003) treat securities law measures, private enforcement and public enforcement, as endogenous variables, and again use legal origins as their instrumental variables to re-estimate their model. Wysocki (2004) treats tax compliance measure as endogenous variable, and use simultaneous equations to estimate his model. Following these previous studies, I treat accounting standard proxies as endogenous variables and use legal origins and economic development measure as instrumental variables to re-estimate the model. Specifically, I jointly estimate the following two equations:

$$\text{PROBIT [EM=1]} = f(\beta_0 + \beta_1 \text{AccountingProxies}_i + \beta_2 \text{Legal}_i + \beta_3 \text{LogGDP}_i + \varepsilon_i) \quad (3)$$

$$\text{AccountingProxies}_i = \gamma_0 + \text{LegalOrigin}_i \gamma + \gamma_{i+1} \text{LogGDP}_i, \text{ average} + \gamma_{i+2} \text{Legal}_i + \gamma_{i+4} \text{LogGDP}_i + \nu_i \quad (4)$$

Variables are defined as in equation (1), except that accounting proxies are treated as endogenous in equation (3). In equation (4), accounting proxies are treated as a linear function of those exogenous variables. I use two available methods to re-estimate the probit model with instrumental variables. Both of these two programs implement the method of Newey (1987). The first method does not account for the fact that the right hand side endogenous variables and the residuals from the equations predicting them are predicted and therefore have some sampling variance/covariance with the other explanatory variables. The second method implements Amemiya (1983) Generalized Least Squares estimators for probit and tobit with endogenous regressors. The endogenous regressors are treated as linear functions of the instruments and the other exogenous variables. Although neither weights nor the robust option is implemented, it provides correct standard errors. Here I report the results from the second method.

#### D. Sample Description

One of the features differentiating this study from previous international studies is that my initial sample includes all of the observations with annual financial data available from Global Vantage Industrial/Commercial file between 1992 and 2003. There are no restrictions, such as the number of observations, for a country to be included in the main test. There are 128,398 observations with required financial data available. After excluding US firms, the initial sample includes 92,669 observations from 77 countries and covers the period from 1992 to 2002. Some countries, such as Iceland and Bahamas, have

only 3 total observations across the sample period while others, such as Japan and the United Kingdom, have thousands of observations.

Earnings are Global Vantage data<sup>32</sup>. I use different deflators to normalize my test variables. When I use total assets as my deflator, the total number of observations in my sample increases dramatically, even though the results are similar (not reported). Following previous studies, I report the results here using lagged market value, which is calculated as year-end common stock shares outstanding time stock price. As Global Vantage use both ‘Ordinary’ and ‘Common’ as issue numbers for common stocks, I use both of them to calculate total market values.

There are 71,193 observations in my initial sample for standardized earnings, and 59,146 observations for standardized change in earnings. Many observations are lost when I create lagged variables for market values and net incomes. When I graph the distribution of standardized earnings and change in earnings, I find that the tails of these distributions are extremely long. In order to better focus on the distribution, I truncate the samples. Following previous studies, I focus on the spread of  $-0.3$  to  $0.3$  for standardized earnings, and  $-0.15$  to  $0.15$  for standardized change in earnings. The samples for conducting the main tests are 64,307 observations for standardized earnings, and 48,298 observations for standardized change in earnings.

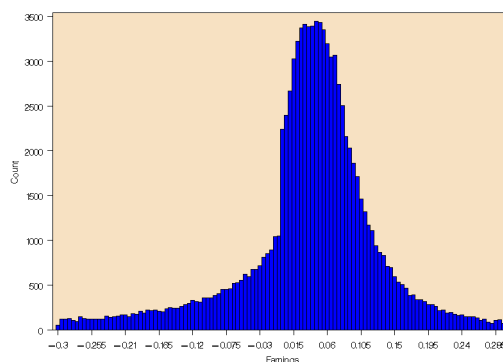
To test beating or meeting analyst forecast, I use data from IBES. As my accounting standard measures are constructed from Global Vantage, this sample size is also limited by the number of observations in Global Vantage. The analyst forecast error is calculated as the difference between a firm’s actual reported earnings per share and the median of the last analyst consensus forecast. After controlling for one-tenth factor, reconciling primary and diluted values, and transferring currencies; my initial sample consists of 53,622 observations. I further limit forecast errors between negative \$1 and positive \$1. My final sample consists of 29,788 observations.

## INTERNATIONAL EARNINGS MANAGEMENT AND ACCOUNTING STANDARDS

### A. Earnings Management to Avoid Losses and Earnings Decrease, and to Meet Analyst Forecasts

Figure 1 Panel A presents the histogram of the scaled earnings with interval widths of 0.005 for the range from  $-0.30$  to  $0.30$ . The figure is relatively normally distributed with a big jump just above zero. There are about 2400 observations in the interval just above zero, and about 800 observations in the interval just below zero. There are only 91 firms with exact zero earnings. The statistic for the interval just below zero is  $-9.67$  with a p-value close to zero, and the statistic for the interval just above zero is  $2.77$  and significant at 1% level. The evidence indicates that international firms are managing earnings against losses.

**Figure 1**  
**Panel A: The Distribution of Earnings across the World**

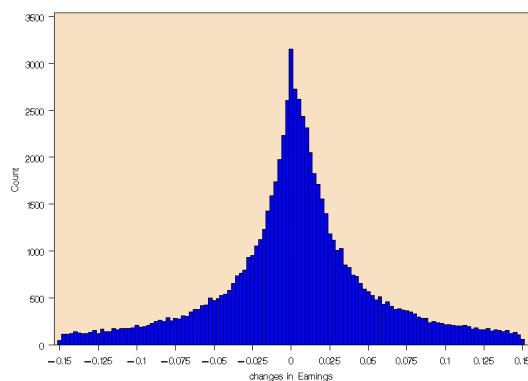


This figure presents the cross-sectional distribution of annual net income standardized by beginning of the year market value. Net income is Global Vantage data<sup>32</sup>. Market value is calculated by summarizing both shares issued as ‘Common’ and ‘Ordinary’ in Global Vantage. The distribution interval widths are 0.005 and the location of zero on the horizontal axis is just below the big jump. The first interval to the right of zero contains all observations in the interval  $(0.000, 0.005)$ , the second interval contains  $(0.005, 0.010)$ , and so on. ‘Count’ is the number of observations in a given earnings interval. This distribution is based on a sample of 64,307 observations.

Next, I estimate the number of international firms that have managed earnings to avoid losses. I use the ex post median as the ex ante mean to estimate the number of firms that have managed earnings based on the assumption of symmetric distribution. I assume that the frequency of firms on the right hand side of the mean is not affected by earnings management to avoid losses, and use the frequency of the respective interval on the right hand side of the mean as the expected frequency for those intervals just below zero. Following Burgstahler and Dichev (1997), I examine three increasingly broad intervals in estimating the number of firms managing earnings. Specifically, I look at  $(-0.01, 0.00)$ ,  $(-0.02, 0.00)$ , and  $(-0.03, 0.00)$  for standardized earnings, assuming earnings management to avoid losses happens within these intervals close to zero. The estimated ex post median for the distribution of standardized earnings is 0.0378. The estimated frequencies for the three increasing intervals are 1,472, 2,772, and 3,823, respectively. It is about 47.98%, 49.58%, and 49.77% of the expected observations in these intervals in the absence of earnings management, about 2.29% - 5.94% of the total 64,307 observations in the truncated sample, and about 2.07% - 5.37% of the 71,193 observations in the initial sample.

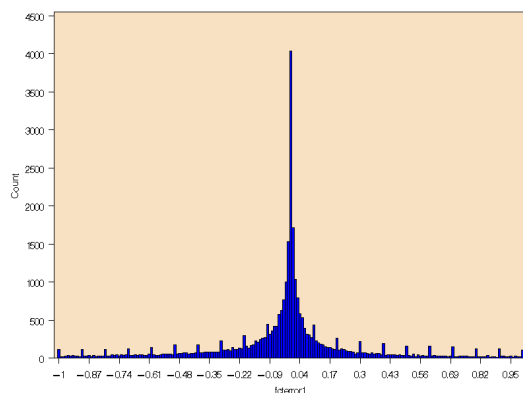
Panel B of Figure 1 reports the histogram of the scaled changes in earnings with interval widths of 0.0025 for the range from  $-0.15$  to  $0.15$ . Surprisingly, this histogram is almost perfectly symmetric. There are 2,889 observations in the interval just above zero, and 2,901 observations in the interval just below zero. The number of firms with exact zero change in earnings is only 42. As we cannot reject the null that the distribution is smooth, I conclude that the distribution method is not sensitive in detecting international earnings management against earnings decrease.

**Panel B: The Distribution of Change in Earnings across the World**



This figure presents the cross-sectional distribution of change in annual net income standardized by lagged market value,  $(\text{Earnings}_{t-1} - \text{Earnings}_{t-2}) / \text{MV}_{t-2}$ . Net income is Global Vantage data32. Market value is calculated by summarizing both shares issued as 'Common' and 'Ordinary' in Global Vantage. The distribution interval widths are 0.0025. The first interval to the right of zero contains all observations in the interval  $(0.000, 0.0025)$ , the second interval contains  $(0.0025, 0.0050)$ , and so on. 'Count' is the number of observations in a given interval. This distribution is based on a sample of 48,298 observations.

Panel C reports the histogram of analyst forecast errors. There are about 1,880 observations in the interval between  $-0.01$  and  $0$ , and about 1,975 observations in the interval between  $0$  and  $0.01$ . Surprisingly, 1,783 observations have exactly zero forecast errors. When so many observations have zero forecast errors, the statistical test becomes tricky. A zero forecast error means that a firm's actual reported earnings per share are exactly equal to the median of analyst consensus forecast. If we treat these zero observations as earnings management firms, and allocate these observations to the interval just above zero; then the distribution of analyst forecast errors are strongly discontinued. The discontinuity is apparent even without any statistical tests. Based on this histogram, I conclude that international firms are managing earnings surprise.

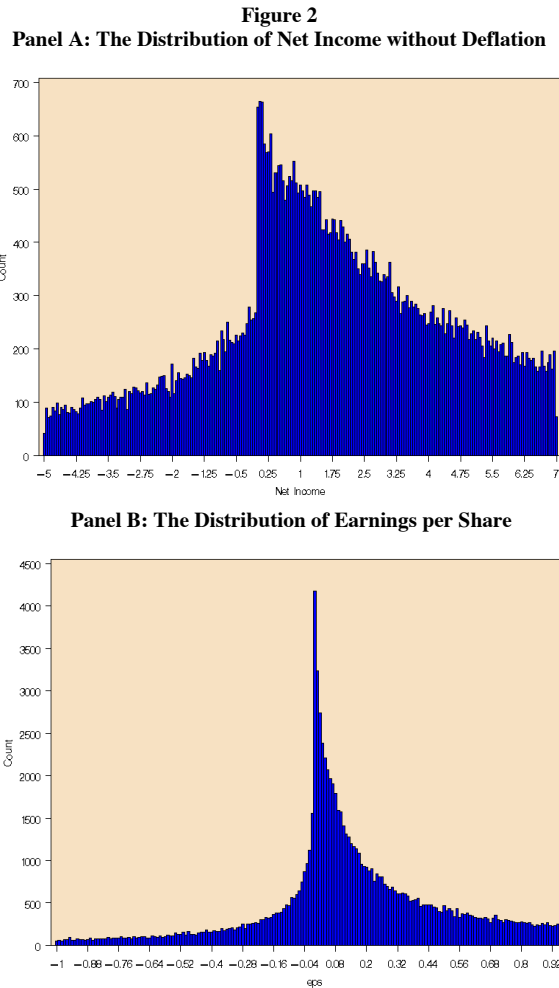
**Panel C: The Distribution of Analyst Forecast Errors across the World**

This figure presents the distribution of analyst forecast errors. Analyst forecast errors are calculated as the difference between firms' actual earnings per share and the median of the last analyst consensus forecasts, i.e.  $\text{Forecast Error} = \text{Actual EPS} - \text{Median}$ . The first interval to the right of zero contains all observations in the interval (0.00, 0.01), the second interval contains (0.01, 0.02), and so on. 'Count' is the number of observations in a given interval. This distribution is based on a sample of 29,788 observations.

### B. Validity of the Distribution Method in the International Setting

Durtschi and Easton (2005) provide alternative explanations for the observed discontinuities in the distribution of earnings, earnings changes, and analyst forecast errors. They argue that the discontinuity is driven by the denominators and sample selection bias. They show that the partitioned distribution of net income without deflation has no discontinuity, and the distribution of diluted EPS has the opposite results: more small loss firms, but less small profit firms. These results contradict earnings management arguments based on the distribution method.

In order to test whether the distribution method is a valid method in the international setting, I graph the distributions of net income without deflation and EPS following Durtschi and Easton (2005). First, I translate all observations that have net income and EPS data from foreign currencies into US Dollars. Following the suggestion of Standard & Poor's Research Insight, I use 12-month moving average rate in translating currencies. I then restrict net income between  $-\$5$  million and  $\$7$  million, and partition them into  $\$50,000$  wide intervals. Figure 2 Panel A provides the graph for the distribution of net income. The distribution is severely discontinued. There are 255 observations in the interval just below zero, and 684 observations in the interval just above zero. Another 179 observations have exact zero net income, and are not included in the intervals adjacent to zero. Statistic tests show that the t-statistic for the interval just below zero is  $-12.56$  with a p-value close to zero, and the statistic for the interval just above zero is  $4.55$  with a p-value close to zero. Panel B of figure 6 shows the distribution of earnings per share between  $-\$1$  and  $\$1$ . Again, the distribution is significantly discontinued. There are 1,736 observations just below zero, and 4,267 observations just above zero. 658 observations have exact zero EPS, and are included in either the interval just above zero or the one just below zero. Statistics show that the t-statistic for the interval just below zero is  $-9.84$  with a p-value close to zero, and the t-statistic for the one just above zero is  $7.74$  with a p-value close to zero.



This figure presents distributions of net income and earnings per share. Panel A presents the distribution of net income between -\$5 million and \$7 million without any deflation; Panel B presents the distribution of earnings per share between -\$1 and \$1. All observations are translated into US dollars. The samples contain 60,371 observations for net income and 91,778 observations for earnings per share. For net income, the distribution interval width is \$50,000. For earnings per share, the distribution interval width is 1 cent.

In summary, the distribution method appears to be a valid tool in detecting earnings management in the international setting, and the results documented in this study are robust to distributions with or without deflators.

### C. Earnings Management and Accounting Standards

Table 1 reports the institutional factors for each country. International accounting standard is a firm-level variable. Within the same country, some firms may adopt international accounting standards, while others may use domestic accounting standards. Here I report the average proportion of firms using international accounting standards for each country during the sample period. The sample average for this variable is 0.18, indicating that 18% of firms in the sample adopt international accounting standards. As there are many missing values for those institutional factors, my sample for testing accounting standards reduces to less than 50 countries compared with 77 countries used in the histogram in the previous section. However, the reduced sample includes all of the major countries. The sample average for accrual accounting is 0.65, indicating that most countries in my sample tend to use more accrual-based accounting standards. The sample average for tax and book conformity index is 0.55, indicating that 55% of countries separate tax and financial reporting. The sample average for the disclosure index is 61.43, and the sample average for IAS convergence index is 31.11. Pearson and Spearman correlation matrices show that investor protection is highly correlated with the accounting standard proxies, except for the international accounting standard measure that is constructed at firm-level. Some of the correlation coefficients are close to 0.8. For brevity, these correlation matrices are not tabulated.

Table 1 – Institutional Characteristics of Sample Countries

Country	Earnings Management	Analyst Forecast Error	Accounting Proxies					Control Variables			Instrumental Variables		
			IAS	Accrual Index	Tax Book Conformity	Disclosure Index	Convergence Index	Legal Enforcement	Investor Protection	logGDP per Capita	Code Law	Common Law	Mean logGDP per Capita
Argentina	9	5	0.037	na	na	45	na	5.79	5	12.40	1	0	8.83
Australia	2	1	0.004	0.82	1	75	36	9.51	5	12.64	1	0	9.75
Austria	6	5	0.290	na	na	54	19	9.36	5	12.13	0	1	10.08
Belgium	8	7	0.134	0.68	0	61	21	9.44	2	12.29	1	0	10.02
Brazil	10	8	0.004	na	na	54	23	6.13	4	13.03	1	0	8.32
Canada	3	2	1.000	0.82	1	74	40	9.75	6	13.26	0	1	9.78
Chile	9	9	0.000	na	na	52	21	6.52	5	10.69	1	0	7.89
China	8	3	0.362	na	na	na	na	na	na	na	0	0	5.51
Colombia	2	10	0.000	na	na	50	na	4.78	1	10.82	1	0	7.56
Czech	4	9	0.395	na	na	na	na	na	na	na	1	0	na
Denmark	1	5	0.055	0.55	1	62	25	10.00	6	11.84	1	0	10.29
Finland	3	2	0.086	0.55	0	77	24	10.00	4	11.49	1	0	10.05
France	3	5	0.139	0.64	0	69	25	8.68	3	14.07	1	0	10.04
Germany	7	6	0.306	0.41	0	62	27	9.05	4	14.46	1	0	10.13
Greece	9	6	0.047	na	na	55	18	6.82	2	11.25	1	0	9.25
Hong Kong	3	4	0.008	0.64	1	69	26	8.91	8	11.56	0	1	9.58
Hungary	9	9	0.794	na	na	na	na	na	na	na	0	0	8.44
Iceland	10	na	0.000	na	na	na	na	na	na	na	0	1	10.11
India	3	8	0.002	na	na	57	21	5.58	9	12.50	0	1	5.58
Indonesia	7	10	0.005	na	na	na	40	2.88	6	11.84	1	0	6.40
Ireland	5	2	0.003	0.82	1	na	40	8.36	4	10.73	0	1	9.38
Italy	7	4	0.267	0.45	0	62	21	7.07	3	13.94	1	0	9.67
Japan	6	8	0.000	0.55	0	65	33	9.17	6	15.18	1	0	10.38
Korea	5	10	0.000	na	na	62	na	5.55	5	12.73	1	0	8.60
Malaysia	5	2	0.007	na	na	76	37	7.72	7	11.00	0	1	7.86
Mexico	1	6	0.008	na	na	60	52	5.37	1	12.69	1	0	8.07
Netherlands	1	3	0.115	0.73	1	64	31	10.00	4	12.68	1	0	9.99
New Zealand	4	1	0.070	0.73	1	70	34	10.00	7	10.69	0	1	9.62
Norway	5	7	0.045	0.82	1	74	41	10.00	6	11.62	1	0	10.17
Pakistan	5	4	0.012	na	na	na	44	3.67	8	10.88	0	1	5.94
Peru	2	2	0.547	na	na	38	46	4.65	2	10.92	1	0	7.79
Philippines	8	6	0.043	na	na	65	29	3.47	4	10.44	1	0	6.99
Poland	2	8	0.094	na	na	na	na	na	na	na	0	0	na
Portugal	8	3	0.018	na	na	36	23	7.19	3	11.41	1	0	8.97
Russian	10	1	0.625	na	na	na	na	na	na	na	0	0	8.16
Singapore	4	1	0.005	0.64	1	78	35	8.93	7	11.68	0	1	9.50
Slovakia	7	10	0.696	na	na	na	na	na	na	na	1	0	na
Slovenia	8	9	0.407	na	na	na	na	na	na	na	1	0	na
South Africa	1	3	0.135	0.68	1	70	51	6.45	7	10.92	0	1	8.39
Spain	6	4	0.008	0.77	0	64	23	7.14	4	13.19	1	0	9.36
Sweden	4	7	0.078	0.59	0	83	37	10.00	4	12.28	1	0	10.11
Switzerland	4	6	0.562	0.32	0	68	25	10.00	3	12.44	1	0	10.63
Taiwan	6	7	0.000	na	na	65	na	7.37	5	12.34	1	0	na
Thailand	6	7	0.003	na	na	64	37	4.89	6	11.72	0	1	7.22
Turkey	7	na	0.215	na	na	51	15	4.79	4	12.08	1	0	7.70
United Kingdom	2	3	0.004	0.82	1	78	38	9.22	9	13.86	0	1	9.66
Venezuela	10	9	0.146	na	na	40	31	5.86	1	10.99	1	0	8.18
Zimbabwe	9	na	0.769	na	na	na	na	5.53	7	8.63	0	1	6.44
Mean	5.50	5.49	0.18	0.65	0.55	62.47	31.11	7.39	4.80	12.03	0.63	0.29	8.75
Median	5.50	6.00	0.05	0.66	1.00	64.00	31.00	7.28	5.00	11.96	1	0	9.25
Std	2.81	2.87	0.26	0.15	0.51	11.61	9.63	2.16	2.11	1.26	0.49	0.46	1.40
Min	1	1	0	0.32	0	36	15	2.88	1	8.63	0	0	5.51



Table 2 reports the results of direct probit model estimation. Model is specified as in equation (1), and earnings management measures are constructed by coding firms in the bin just above zero and equal to zero as 1, and those in the bin just below zero as 0 (see figure 1). Panel A tests earnings management to avoid losses. In the first test, international accounting standards measure is used as the accounting standard proxy. The coefficient of the accounting standard proxy is  $-0.245$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.184$  and significant at 1 percent level. The coefficient for GDP per capita is  $0.055$  and significant at 5 percent level. In the second test, accrual accounting is used as the accounting standard proxy. The estimated coefficient is  $-1.16$  with a p-value close to zero. The coefficient of legal enforcement is  $-0.174$  and significant at 1 percent level. However, the coefficient of GDP per capital is not significant. Tax book conformity measure is used as the accounting proxy in the third test. Its coefficient is  $-0.41$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.156$  and significant at 5 percent level. GDP per capita is still not significant. In the fourth test, disclosure level is used as the proxy. The coefficient of the disclosure level is  $-0.017$  with a p-value close to zero. Coefficients of legal enforcement and GDP per capita are not significant. In the last test, international accounting standard convergence index is used as the proxy. The coefficient of the accounting standard proxy is  $-0.038$  and significant at 1 percent level. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is  $0.07$  and significant at 1 percent level.

**Table 2 – Direct Estimation of Probit Model Assuming no Endogeneity**

<b>Panel A. Beating Positive Earnings</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	
									t	p-value
Accounting Proxies	-0.245	0.009	-1.160	<.0001	-0.410	<.0001	-0.017	<.0001	-0.038	<.0001
Legal Enforcement	-0.184	0.002	-0.174	0.004	-0.156	0.012	0.001	0.955	-0.045	0.509
LogGDP	0.055	0.026	0.010	0.710	-0.027	0.400	0.011	0.622	0.070	0.004
Constant	1.598	0.023	2.818	0.000	2.593	0.001	1.659	<.0001	1.330	0.061
Likelihood Ratio		32.71		61.57		62.97		74.96		51.57
Pseudo R-Square		1.07		2.02		1.50		1.95		1.72
Number of Observations		2,981		2,981		2,981		3,804		2,981
<b>Panel B. Beating Last-Year Earnings</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	
									t	p-value
Accounting Proxies	0.054	0.486	0.040	0.837	-0.027	0.698	-0.002	0.615	-0.007	0.164
Legal Enforcement	-0.123	0.008	-0.121	0.009	-0.117	0.013	0.018	0.390	-0.101	0.036
LogGDP	-0.033	0.078	-0.034	0.087	-0.043	0.086	-0.021	0.212	-0.034	0.059
Constant	1.766	0.001	1.748	0.002	1.865	0.001	0.405	0.136	1.816	0.001
Likelihood Ratio		27.71		23.89		26.26		29.15		23.19
Pseudo R-Square		0.52		0.45		0.49		0.45		0.40
Number of Observations		3,657		3,657		3,657		4,560		3,657
<b>Panel C. Beating Analyst Forecasts</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	
									t	p-value
Accounting Proxies	0.379	<.0001	-0.594	0.001	-0.423	<.0001	-0.021	<.0001	0.013	0.002
Legal Enforcement	-0.068	0.027	-0.005	0.865	0.034	0.288	0.022	0.298	-0.036	0.225
LogGDP	0.405	<.0001	0.410	<.0001	0.325	<.0001	0.367	<.0001	0.472	<.0001
Constant	-4.617	<.0001	-4.779	<.0001	-4.164	<.0001	-3.375	<.0001	-6.116	<.0001
Likelihood Ratio		449.77		425.18		448.82		531.72		424.36
Pseudo R-Square		15.40		14.63		15.38		14.92		14.60
Number of Observations		2,688		2,688		2,688		3,291		2,688

Results in Panel A of Table 2 show that when international firms adopt high-quality accounting standards, their earnings management activities will be constrained regardless of the quality of their domestic accounting standards. However, legal enforcement is important in this setting. Stronger legal enforcement tends to decrease earnings management. Even though accrual accounting standards give management more room to manage earnings, results show that when a country adopts accrual-based accounting standards, firms' earnings management activities will be limited. Consistent with arguments in prior studies, legal enforcement is important in this setting. Better legal enforcement will constrain earnings management. Separating tax reporting and financial reporting also constrain earnings management, and legal enforcement is also important in this setting. Increased disclosure level will decrease the probability of international firms' earnings management. However, legal enforcement seems not important in this setting, indicating that increased disclosure will always decrease management's discretion in extracting private benefits regardless of the legal environment. It seems that this finding supports the argument by Dyck and Zingales (2004) that managements are trying to behave in ways that are "socially

acceptable". Finally, when a country's accounting standards converge to international accounting standards, firms' earnings management activities will also be limited.

Panel B of Table 2 presents results of empirical tests for earnings management against earnings decrease. As Panel B of Figure 1 shows that the distribution of earnings changes is perfectly symmetric, the distribution method is not sensitive in detecting earnings management against earnings decrease if we do not want to conclude that there is no earnings management against earnings decrease internationally. Consistent with Panel B of Figure 1, none of my accounting standards proxies is significant in all of the five tests. These results somehow provide more credit to the earnings management measure, and make the results in Panel A more convincing.

Panel C of Table 2 reports results for earnings management against analyst forecasts. In the first test, international accounting standards measure is used as the accounting standard proxy. The coefficient of the accounting standard proxy is 0.379, positive and significant at 1 percent level. The coefficient of legal enforcement is  $-0.068$  and significant at 5 percent level. The coefficient of GDP per capita is 0.405 and significant at 1 percent level. In the second test, the coefficient of accrual accounting is  $-0.594$  with a p-value close to zero. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is 0.41 and significant at 1 percent level. The estimated coefficient of tax book conformity measure in the third test is  $-0.423$  significant at 1 percent level. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is 0.325, significant at 1 percent level. In the fourth test, the coefficient of the disclosure level is  $-0.021$  with a p-value close to zero. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is 0.367 and significant at 1 percent level. In the last test, the coefficient of international accounting standard convergence index is 0.013 and significant at 1 percent level. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is 0.472 and significant at 1 percent level.

Results in Panel C shows that accrual-based accounting standards, separating tax and financial reporting, and increased disclosure level all tend to decrease earnings management against analyst forecasts. However, firms that adopt international accounting standards tend to be more likely to manage earnings to meet analyst forecasts; and firms in countries where domestic accounting standards are converging to international accounting standards are also more likely to meet or beat analyst forecasts. It seems hard to understand these contradicting results. Prior studies show that firms manage earnings surprise through expectation management. It means that firms downward guide analysts' forecasts instead of managing their books. This phenomenon has been documented by both Matsumoto (2002) using US sample and Brown and Higgins (2002) using international sample. My results show that when individual dimensions of accounting standard quality, such as accrual or disclosure, are examined, they are always negatively correlated with earnings surprise measure. When composite measures, such as the international accounting standards measure and international convergence index, are tested, they are always positively associated with earnings surprise measure. A single dimension of accounting standard quality cannot determine the total quality of a country's accounting and disclosure system. For example, it doesn't necessarily mean that a country with separated tax reporting and financial reporting has a high-quality accounting and disclosure system. A country may have a higher quality accounting and disclosure system only when most of those individual accounting quality measures, if not all of them, are at higher level. My composite measures represent high-quality accounting and disclosure systems. If we believe that increased disclosures decrease information asymmetry and limit managements to manage earnings, then we would expect that firms using high-quality accounting standards are more likely to manage analysts' expectations, *ceteris paribus*. Based on the above analysis and the findings in Brown and Higgins (2001), I conjecture that firms under these high-quality accounting standards are more likely to engage in expectation management. The phenomenon that firms with high-quality accounting standards tend to beat or meet analyst forecasts is driven by expectation management. I argue that these seemingly contradicting results are consistent, and conclude that high-quality accounting standards constrain earnings management to beat or meet analyst forecasts.

Results in Panel C also show that high level of legal enforcement will decrease earnings management, even though it is only significant in the first test. GDP per capita is always positive and significant across all tests, indicating that firms in developed countries are more likely to manage earnings surprise. This finding is consistent with those stories reported in Section II.

In sum, Table 2 shows that international accounting standards, disclosure level, convergence to international accounting standards, accrual-based accounting, and separating tax and financial reporting all constrain international firms' earnings management activities to avoid losses. It also shows that high-quality accounting standards constrain earnings management to meet or beat analyst forecasts. However, I did not find any evidence that international firms are managing earnings against earnings decrease. I feel reluctant to admit that international firms are not managing earnings against

earnings decrease, and conclude that the distribution method is not sensitive in detecting earnings management to avoid earnings decrease internationally. Consistent with findings of previous studies, the development of legal enforcement decreases earnings management to avoid losses and to meet or beat analyst forecasts. Results also show firms in developed countries are more likely to manage earnings to avoid losses and to meet or beat analyst forecasts.

#### D. Controlling for Investor Protection and the Endogeneity of Accounting Standard Measures

In the last section, I show that accounting standards are important in constraining earnings management to avoid losses. In this section, I further address some issues raised by the international earnings management literature and accounting standard studies.

Panel A of Table 3 reports results for regressions after controlling for investor protection. All variables are specified as in equation (2). In the first test, international accounting standards measure is used as the accounting standard proxy. The coefficient of the accounting standard proxy is  $-0.285$  and significant at 1 percent level. The coefficient of investor protection is  $-0.072$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.142$  and significant at 5 percent level. The coefficient for GDP per capita is  $0.044$  and significant at 10 percent level. In the second test, accrual accounting is used as the accounting standard proxy. The estimated coefficient is  $-1.011$  with a p-value close to zero. The coefficient of investor protection is not significant. The coefficient of legal enforcement is  $-0.169$  and significant at 1 percent level. The coefficient of DGP per capital is not significant. The coefficient of tax book conformity measure is  $-0.53$  and significant at 1 percent level. The coefficient of investor protection is not significant. The coefficient of legal enforcement is  $-0.157$  and significant at 5 percent level. GDP per capita is still not significant. In the fourth test, the coefficient of the disclosure level is  $-0.017$  and significant at 1 percent level. The coefficient of investor protection is again not significant. Coefficients of legal enforcement and GDP per capita are also not significant. In the last test, the coefficient of international accounting standard convergence index is  $-0.041$  and significant at 1 percent level. Coefficients of investor protection and legal enforcement are not significant. The coefficient of GDP per capita is  $0.071$  and significant at 1 percent level.

**Table 3 – Further Control for Investor Protection and the Endogeneity of Accounting Standard Measures**

<b>Panel A. Further Control for Investor Protection</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level Coefficient	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	nt	p-value
Accounting Proxies	-0.285	0.002	-1.011	0.002	-0.530	0.001	-0.017	0.001	-0.041	<.0001
Investor Protection	-0.072	0.000	-0.017	0.484	0.031	0.380	-0.001	0.948	0.010	0.687
Legal Enforcement	-0.142	0.022	-0.169	0.006	-0.157	0.011	0.001	0.967	-0.039	0.568
LogGDP	0.044	0.077	0.016	0.579	-0.052	0.226	0.011	0.619	0.071	0.004
Constant	1.745	0.014	2.691	0.001	2.825	0.000	1.654	<.0001	1.291	0.072
Likelihood Ratio		65.98		62.01		56.88		88.46		58.83
Pseudo R-Square		2.19		2.06		1.89		2.30		1.95
Number of Observations		2,381		2,381		2,381		3,309		2,381
<b>Panel B. Joint Estimation with Instrumental Variables</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level Coefficient	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	nt	p-value
Accounting Proxies	-0.927	0.056	-1.396	0.000	-0.405	0.000	-0.020	0.010	-0.023	0.014
Legal Enforcement	-0.023	0.424	-0.168	0.006	-0.157	0.011	0.015	0.696	-0.026	0.251
LogGDP	0.011	0.689	-0.002	0.960	-0.026	0.446	0.007	0.772	0.046	0.014
Constant	0.815	0.002	3.070	0.000	2.177	0.003	1.779	0.000	0.987	0.001
Likelihood Ratio		N/A		N/A		N/A		N/A		N/A
Pseudo R-Square		N/A		N/A		N/A		N/A		N/A
Number of Observations		N/A		N/A		N/A		N/A		N/A

Results in Panel A show that investor protection tends to decrease earnings management to avoid losses, although it is only significant in the first regression. Results for accounting standard measures are very similar to results reported for equation (1), indicating that high-quality accounting standards constrain earnings management to avoid losses. Results for legal enforcement and economic development are also close to those reported in equation (1). Strong legal enforcement tends to decrease earnings management to avoid losses, and firms in developed countries are more likely to manage earnings to avoid losses.

Panel B of Table 3 reports results of jointly estimating probit model with instrumental variables. Here I treat accounting standard measures as being endogenous, and use legal origin and economic development as instrumental variables to jointly estimate two equations. Variables are specified as in equation (3) and (4). In the first test, the coefficient of the international accounting standard measure is  $-0.927$  and significant at 10 percent level. The coefficient of legal enforcement and the coefficient of GDP per capita are both not significant. In the second test, the coefficient of accrual accounting is  $-1.396$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.168$  and significant at 1 percent level. The coefficient of GDP per capital is not significant. The estimated coefficient of tax book conformity measure in the third test is  $-0.405$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.157$  and significant at 5 percent level. The coefficient of GDP per capita is not significant. In the fourth test, the coefficient of the disclosure level is  $-0.02$  and significant at 1 percent level. Coefficients of legal enforcement and GDP per capita are not significant. In the last test, the coefficient of international accounting standard convergence index is  $-0.023$  and significant at 5 percent level. The coefficient of legal enforcement is not significant. The coefficient of GDP per capita is  $0.046$  and significant at 5 percent level.

Panel B shows that high-quality accounting standards constrain earnings management to avoid losses. Legal enforcement also constrains earnings management to avoid losses, and firms in developed countries are more likely to manage earnings. Results are comparable to those reported in the previous section. In sum, Table 3 shows that high-quality accounting standards limit managements' discretion in manipulating reported accounting numbers to avoid losses, and results hold after controlling for investor protection and the endogeneity of accounting standard measures.

#### E. Further Testing the Relation between Accounting Standards and Earnings Surprise

In the previous section, I admit that it is too adventurous to conclude that the positive association between high-quality accounting and disclosure systems and earnings managements to meet or beat analyst forecasts is driven by expectation management. As we know that firms could either manage analyst forecasts or manage reported numbers, the research design regarding earnings management to meet or beat analyst forecasts is flawed. In order to control for this endogeneity, I use OLS with Newey and West (1987) robust standard errors to re-estimate the model. The absolute value of analyst forecast error is used as the dependent variable. Analyst forecast errors are calculated as the difference between firms' actual earnings per share and the median of the last analyst consensus forecast, i.e.  $\text{Forecast Error} = \text{Actual EPS} - \text{Median}$ . Panel A of Table 4 reports results.

**Table 4 – Control for the Endogeneity of Analyst Forecast Errors and Investor Protection**

<b>Panel A. Control for Endogeneity of Analyst Forecast</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level Coefficient	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	nt	p-value
Accounting Proxies	-0.080	<.0001	-0.291	<.0001	-0.147	<.0001	-0.003	<.0001	-0.002	<.0001
Legal Enforcement	-0.011	<.0001	0.018	<.0001	0.028	<.0001	-0.006	<.0001	-0.016	<.0001
LogGDP	0.058	<.0001	0.048	<.0001	0.026	<.0001	0.047	<.0001	0.053	<.0001
Constant	-0.437	<.0001	-0.413	<.0001	-0.326	<.0001	-0.155	<.0001	-0.276	<.0001
Adj R-Square		9.01		11.04		13.50		7.86		7.99
Number of Observations		27,686		22,040		22,040		27,356		26,827

<b>Panel B. Further Control for Investor Protection</b>										
Independent Variables	International Accounting		Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level Coefficient	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	nt	p-value
Accounting Proxies	-0.080	<.0001	-0.288	<.0001	-0.225	<.0001	-0.003	<.0001	-0.002	<.0001
Investor protection	-0.001	0.598	-0.001	0.544	0.036	<.0001	0.001	0.608	0.000	0.858
Legal Enforcement	-0.011	<.0001	0.018	<.0001	0.035	<.0001	-0.006	<.0001	-0.016	<.0001
LogGDP	0.057	<.0001	0.048	<.0001	0.022	<.0001	0.048	<.0001	0.053	<.0001
Constant	-0.432	<.0001	-0.407	<.0001	-0.486	<.0001	-0.157	<.0001	-0.278	<.0001
R-Square		9.03		11.16		14.09		7.94		8.08
Number of Observations		27,686		22,040		22,040		27,356		26,827

In the first test, the coefficient of the international accounting standard measure is  $-0.08$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.011$ , and the coefficient for GDP per capita is  $0.058$ . Both are significant at 1 percent level. In the second test, the coefficient of accrual accounting is  $-0.291$  and significant at 1 percent level. The coefficient of legal enforcement is  $0.018$  and significant at 1 percent level. The coefficient of GDP per capital is  $0.048$  and significant at 1 percent level. The estimated coefficient of tax book conformity measure in the third test is  $-0.147$ , significant at 1 percent level. The coefficient of legal enforcement is  $0.028$  and significant at 1 percent level. The coefficient of GDP per capita is  $0.026$  and significant at 1 percent level. In the fourth test, the coefficient of the disclosure level is  $-0.003$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.006$  and significant at 1 percent level. The coefficient of GDP per capita is  $0.047$  and significant at 1 percent level. In the last test, the coefficient of international accounting standard convergence index is  $-0.002$  and significant at 1 percent level. The coefficient of legal enforcement is  $-0.016$  and significant at 1 percent level. The coefficient of GDP per capita is  $0.053$  and significant at 1 percent level.

Panel B of Table 4 shows results after controlling for investor protection. Coefficients for accounting standard measures are all negatively correlated with analyst forecast error, and very close to those reported in Panel A. None of the coefficients for investor protection is significant except for the test of tax book conformity. GDP per capita is always positively correlated with analyst forecast error.

Results in Table 4 consistently show that high-quality accounting standards decrease analyst forecast error. These findings support my argument that high-quality accounting standards provide high-quality reported financial information, which decreases uncertainty and information asymmetry, and thus decreases analyst forecast error.

Results in Table 4 are based on the total available observations between  $-\$1$  and  $\$1$  as shown in Panel C of Figure 1. The number of observations used in each test is over 22,000. One concern is that reported standard errors might be affected by the number of observations. In order to address this concern, I re-run the tests based on a random sample of slightly over one thousand observations. Results are consistent.

## F. Country Level Regressions

Results documented in previous sections are based on firm-level regressions. As a robustness check, I aggregate earnings management measures to country level and re-estimate the results using country-level regressions.

My country-level earnings management measure is calculated as the proportion of firms in the bin just above zero for each country weighted by the proportion of firms for each country in the total sample. The expected value of this measure is 1. When this measure is bigger than 1, the likelihood of earnings management is high; when it is smaller than 1, indicating lower probability of earnings management. For example, there are 500 firms from Belgium in the truncated sample which has 70,227 observations. So the first ratio is 0.0071 (500/70,227). There are 39 Belgium firms in the bin just above zero which has 2,676 observations. So the second ratio is 0.0146 (39/2,676). The earnings management measure for Belgium is 2.047 (0.0146/0.0071), which indicates that the likelihood of earnings management is very high for Belgium firms. Similarly, the earnings management measure for Finland is 0.48, which indicates that the likelihood of earnings management is relatively low for Finish firms. I then rank these measures into deciles, and use these ranked values to re-estimate the results for beating positive earnings. These ranked values are reported in the second column of Table 1. I first estimate Equation (1) using OLS with robust standard errors. Results are reported in Panel A of Table 5.

Table 5 – Country-Level Regressions

<b>Panel A. Beating Positive Earnings</b>								
Independent Variables	Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficien					p-value	Coefficien	p-value
	t	p-value	Coefficient	p-value	Coefficient	p-value	t	p-value
Accounting Proxies	-2.877	0.276	-2.470	0.016	-0.101	0.037	-0.159	0.000
Legal Enforcement	-0.321	0.551	-0.225	0.611	-0.109	0.706	-0.509	0.005
LogGDP	0.405	0.267	-0.007	0.984	0.184	0.586	-0.135	0.677
Constant	3.658	0.672	7.445	0.270	9.910	0.064	15.450	0.000
R-Square	0.18		0.37		0.23		0.45	
N of Observations	20		20		35		35	

<b>Panel B. Beating Positive Earnings - 2SLS</b>								
Independent Variables	Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficien					p-value	Coefficien	p-value
	t	p-value	Coefficient	p-value	Coefficient	p-value	t	p-value
Accounting Proxies	-14.621	0.001	-2.508	0.039	-0.235	0.063	-0.235	0.061
Legal Enforcement	-0.675	0.114	-0.187	0.583	0.274	0.573	-0.543	0.003
LogGDP	0.072	0.841	-0.046	0.903	0.181	0.638	-0.195	0.551
Constant	18.700	0.014	7.611	0.205	15.345	0.01	18.801	0.006
R-Square	-0.56		0.37		-0.51		0.27	
N of Observations	20		20		35		35	

<b>Panel C. Analyst Forecast Errors and Accounting Standards</b>								
Independent Variables	Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficien					p-value	Coefficien	p-value
	t	p-value	Coefficient	p-value	Coefficient	p-value	t	p-value
Accounting Proxies	-5.086	0.082	-2.236	0.057	-0.083	0.086	-0.087	0.043
Legal Enforcement	0.301	0.381	0.402	0.287	-0.367	0.083	-0.615	0.007
Constant	-2.865	0.607	-2.178	0.701	4.090	0.332	5.821	0.178
R-Square	0.31		0.39		0.25		0.21	
N of Observations	20		20		35		35	

<b>Panel D. Analyst Forecast Errors and Accounting Standards - 2SLS</b>								
Independent Variables	Accrual Accounting		Tax Book Conformity		Disclosure Level		Convergence Level	
	Coefficien					p-value	Coefficien	p-value
	t	p-value	Coefficient	p-value	Coefficient	p-value	t	p-value
Accounting Proxies	-17.851	0.000	-4.379	0.001	-0.145	0.001	-0.482	0.022
Legal Enforcement	-0.079	0.849	0.220	0.572	-0.197	0.418	-0.762	0.020
LogGDP	0.218	0.517	0.050	0.901	0.388	0.243	0.306	0.381
Constant	13.665	0.057	3.829	0.562	4.666	0.229	22.254	0.037
R-Square	-0.37		0.19		-0.30		-0.29	
N of Observations	20		20		35		35	

As International Accounting Standards measure is a firm-level measure, I only test the four country-level accounting standard measures. Except for Accrual accounting measure, the rest are negative and significant at 5% or 1% level. The coefficient of Accruals accounting measure is -2.88 with a p-value of 0.276. However, the sample size is very small, only 20 countries/observations in the regression. To address the endogeneity problem of accounting standard measures, I use 2SLS to re-estimate Equation (3) and (4), and results are reported in Panel B. All of the accounting standard measures are negative and significant at 10% or lower level. The coefficient of accruals accounting measure is -14.62 and significant at 1% level. I also re-run all the tests after adding investor protection, and results are consistent.

I use the median of analyst forecast errors from country A as its country-level measure of analyst forecast error. As the probability of earnings surprise management is very high when the forecast error is exactly zero, I exclude these zero



forecast errors before estimating this measure. I then rank these medians into deciles, and use these ranked values to re-estimate the results. These ranked values are reported in the third column of Table 1. I first estimate Equation (1) using OLS with robust standard errors. Results are reported in Panel C of Table 5.

Consistent with results documented in previous sections, coefficients of accounting standard proxies are all negative and significant at 5% or 10% level, indicating that high quality accounting standards decrease analyst forecast error. The disclosure index is ranked value, as the coefficient is not significant when I use the raw value. In Panel D, I use 2SLS to re-estimate the results, and results are consistent and even stronger. I also re-run all the tests after adding investor protection, and results are still consistent.

## **DISCUSSION AND CONCLUSION**

This study finds evidence that accounting standards constrain earnings management after controlling for institutional factors identified in previous studies. Like many other institutions, accounting standards are endogenous, and results documented in prior studies associated with accounting standards are always suspicious. In this paper, I explicitly deal with this concern and use instrumental variables to re-estimate the model, and find consistent results. However, results are based on the assumption that these instrumental variables, i.e. legal origin and economic development, are exogenous and valid instruments. If this assumption does not hold, results documented here are not reliable. As the focus of this paper is not to discuss and identify valid instruments for accounting standards, I do not further discuss this subject. It is interesting to see future studies to specifically focus on this subject.

The current international heterogeneity of accounting standards provides a unique setting to evaluate the quality of accounting standards. As I mentioned before, I am also interested in testing the difference between principle-based accounting standards and rule-based accounting standards. However, this measure has not been quantified in prior studies, even though Katherine Schipper, a FASB board member, has discussed this issue many times in public speeches. I expect that future studies will provide more metrics to measure the quality of accounting standards.

This paper documents evidence that firms are managing earnings internationally. I further discuss the distribution method, and provide evidence that it is still a valid method in earnings management studies. However, I also find the limitation of this method in detecting earnings management against earnings decrease across countries. Future studies using this method should be aware of the pros and cons I have discussed throughout the text and the appendix. Formal statistical tests can only serve as a complement and can never change the nature of this method, as any formal tests are actually constructed based on the observed distribution.

Throughout this paper, I argue that accounting standard policy is an important institution in determining the quality of reported financial information; however, I know that financial reporting quality is determined by complex combinations of political and economic factors. Focusing on accounting standards alone is misleading and incomplete. I argue that accounting standards constrain earnings management, but it does not necessarily mean that a country with high-quality accounting standards will have high-quality reported financial information. Security laws, legal enforcement, and investor protection might be more fundamental institutions in determining the quality of reported financial information. However, it is hard to imagine that a country with a common law legal system, high-quality investor protection, and strong legal enforcement will have high-quality reported financial information, if it has a low-quality accounting and disclosure system. How could accountants measure transactions precisely with a set of low-quality accounting standards?

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## APPENDIX A

### Discussion of the Construction of Statistics for Testing Discontinuities in Distributions

If  $X$  is normal, we have  $X \sim N(\Phi_x, \sigma_x)$ , and

$$Z = (X - \Phi_x) / \sigma_x \sim N(0, 1)$$

$P(Z \leq z) = \Phi(z) = \int_{-\infty}^z \phi(t) dt$ , where

$$\phi(t) = (1 / (2\pi)^{0.5}) \exp\{-t^2/2\}$$

Based on the characteristics of normal distribution, we have Fact 1. A linear function of a normal r.v. is normal; and Fact 2. A linear combination of normal r.v.s is also normal. Facts 1 and 2 imply that intervals of  $X, v_1, v_2, \dots, v_n$ , are normally distributed if  $X$  is normal, i.e.

$V \sim N(\Phi_v, \sigma_v)$ , and

$$Z = (v_i - \Phi_v) / [\sigma_v / (n)^{0.5}] \sim N(0, 1)$$

As we are testing the smoothness of the curve of the normal distribution, we cannot assume that the expected frequency of intervals is constant across the distribution; but we assume that the variation of frequencies is constant across the curve. So we *define* the process of the frequency,  $F$ , follows M process.

$F \sim M(E(f_i), \sigma_F)$

Here  $E(f_i)$  depends on  $i$ , the frequency of a specific interval. I use normal distribution to approximate this process.

$$M = (f_i - E(f_i)) / [\sigma_F / (n)^{0.5}] \sim N(0, 1)$$

Specifically, I use the following formula to compute the t-like statistics:

$$M(f_i) = \frac{f_i - E(f_i)}{S(F)} \sim t(n-1) \quad \text{where}$$

$$E(f_i) = (f_i + f_{i+1})/2, \quad S(F) = \{(\sum_i^n (f_i - E(f_i))^2) / (n - 1)\}^{0.5}$$

The formal statistical test does not depend on the width of intervals. It only depends on the frequency of a specific interval.<sup>9</sup> Using this method, we lose the last interval in constructing the formal statistical tests. The p-value of the interval  $i$  is calculated as 1 minus the probability of the absolute value of the t-like statistic given the degree of freedom of  $n-1$  times 2, using Student's t-distribution.

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<sup>9</sup> DeGeorge et al. (1999) assume that differences of the interval frequencies converge to the mean around the zero benchmark. I discussed this with Ilia Dichev. Both of us agree that the first difference of the interval frequencies follows a process that converges to zero when it is close to the two tails. This process increases and converges to a finite number when it is close to the mean of the underlying distribution.