Information Risk and CDS Markets

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ABSTRACT

This study examines the association between earnings attributes as proxies of information risk and credit default swap (CDS) spreads around compliance with the Sarbanes-Oxley Act of 2002 (SOX). I find a strong association between CDS spreads and earnings attributes. In particular, I find that information risk proxies of accounting-based and market-based earnings attributes matter to the CDS markets before compliance with SOX. This is consistent with the CDS market gathering information from all possible sources before SOX. However, after SOX, the CDS markets find accounting-based attributes to be relatively more important than market-based attributes. In terms of economic significance, a one percentage decrease in the accrual quality leads to an increase in CDS spreads by 13 basis points. This association between CDS spreads and information risk is stronger for foreign private issuers (FPIs) than for U.S. firms. This may be due to the switch for FPIs from prior reporting exemptions to the higher disclosure requirements of SOX. Overall, this study establishes that CDS markets use earnings attributes as proxies for information risk.

Keywords: Credit Default Swap (CDS), Information Risk, Earnings Attributes, Sarbanes-Oxley Act of 2002 (SOX), Credit Risk.

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1. Introduction

This paper examines the association between earnings attributes and CDS spreads around SOX compliance. Specifically, it examines whether seven earnings attributes—accrual quality, earnings persistence, predictability, smoothness, value relevance, timeliness, and conservatism—are associated with CDS spreads. It also explores whether this association differs for FPIs, as compared to U.S. firms. Prior studies, including by Callen et al. (2009), have shown that earnings are the main source of information for the CDS markets. However, it is unclear how the riskiness of this information, as measured by earnings attributes, impacts CDS spreads. As information risk is non-diversifiable and has been shown to impact pricing decisions in the stock market (Easley and O'Hara, 2004; Lambert et al., 2012; Francis et al., 2004), I expect that it will be associated with CDS spreads.

Although earlier papers associate earnings attributes with the cost of capital (e.g., Francis et al., 2004; Francis et al., 2005; and Barth et al., 2013), there are ample reasons for examining the association between earnings attributes and CDS spreads. First, CDS spreads measure pure credit risk and are a less noisy measure of this risk than other debt instruments. Although credit risk can also be measured using corporate bond spreads, CDS premia offer many advantages (Callen et al. 2009). Bond spreads include factors unrelated to credit risk, such as systematic risk, and interest-rate risk drives fixed-rate corporate bond yields and secondary-market loan rates, independent of credit risk. Corporate bonds and secondary loan markets also include embedded options, guarantees, and covenants. In contrast, CDS spreads provide a much cleaner measure of risk. And the CDS market, which is part of the wider credit derivatives market, is huge—valued at $6.8 trillion as of 2016—and hence an important

component of the credit market.[1]Finally, the FPIs listing on the U.S. markets issue debt in the U.S. and CDS contracts are traded on that debt.

This paper focuses, in particular, on FPIs. These are foreign firms cross-listed in the U.S.[2] For foreign firms, cross-listing increases visibility, prestige, and liquidity (Li, 2014). The presence of foreign firms likewise enhances the reputation of the U.S. markets. The Securities and Exchange Commission (SEC) has traditionally encouraged FPIs to enter U.S. markets and allowed them several exemptions from U.S. regulations.[3] In this spirit, the SEC delayed compliance with SOX for FPIs. The first set of U.S. firms, those with market capitalizations above $75 million, had to comply beginning with the fiscal year ending on or after November 2004. But the first set of FPIs, those with market capitalizations of above $700 million, had to comply nearly two years later—beginning with the fiscal year ending on or after July 15, 2006.

Li (2014) finds that FPIs tend to be higher quality than U.S.-based issuers. This is consistent with the bonding hypothesis, whereby foreign firms signal their quality by adhering to the stricter disclosure and governance practices of the U.S. (Naughton et al., 2016). But FPIs tend to differ from domestic issuers in terms of their backgrounds and ownership structure (Li, 2014). As a result, any conclusions drawn regarding the impact of

[1] See Philip Stafford and Joe Rennison, "Credit default swaps activity heats up," *The Financial Times*, Feb. 4, 2016.

[2] According to the definition in Rule 405 under the Securities Act of 1933 (Securities Act) and Rule 3b-4(c) under the Securities Exchange Act of 1934, an FPI is "any foreign issuer other than a foreign government except an issuer meeting the following conditions: 1) More than 50% of the outstanding voting securities of the issuer are directly or indirectly held of record by residents of the United States and 2) Any one of the following: i) the majority of executive officers or directors of the issuer are United States citizens or residents; or ii) more than 50% of the assets of the issuer are located in the United States; or iii) the business of the issuer is administered principally in the United States."

[3] Among others, FPIs are exempt from filing quarterly financial reports, Section 14a-14c proxy rules, Section 14f tender offer rules, and Section 16 short swing profit rules.

SOX compliance on earnings attributes and the credit risk market reaction for U.S firms do not automatically extend to FPIs and vice versa.

Following a series of high-profile accounting scandals, the U.S. Congress passed SOX with the aim of restoring investor confidence in the U.S. financial markets (Coates, 2007). SOX required U.S. firms to comply with enhanced disclosure and governance rules. The act aimed to protect U.S. investors by enforcing stricter rules against any misstatements in financial reports and fraud. The law not only requires increased disclosure of financial information but also written attestations from management. It also creates criminal penalties for managers who commit fraud and requires an independent audit committee to verify reported information. Due to these provisions, managers would be expected to be more cautious in their reporting after the passage of SOX. As Iliev (2010) and DeFond and Lennox (2011) discuss, a consequent improvement in enforcement quality would then lead to a possible improvement in the quality of information disclosed. As a result, the seven earnings attributes considered in this study are likely to improve with SOX compliance. Prior literature corroborates this view. For instance, Doyle et al. (2007) find that accrual quality is higher post SOX. Chambers and Payne (2011) establish that earnings show higher persistence after SOX, while Lobo and Zhou (2006) show an improvement in conservatism. Aiming to extend the findings of these studies, I examine how SOX compliance affects the association between CDS spreads and the earnings attributes.

Although there is a large accounting literature on debt contracting, as discussed by Christensen et al. (2016), studies on the CDS markets are scarce compared to those on stock and bond markets. Only two studies closely relate to mine. The first study, by Callen et al. (2009), examines the impact of earnings on CDS markets for a sample of U.S. firms and finds that earnings are negatively associated with the level of CDS premia. I, in contrast, examine the association between CDS spreads and specific earnings-based proxies of information risk

for FPIs and U.S. firms. These earnings attributes, which are proxies of information risk, reflect the downside risk as opposed to the overall risk. Moreover, I examine how this association changes around SOX compliance.

The second closely related study, by Andrade et al. (2014), investigates the impact of SOX on the cost of debt for U.S. firms. They find that CDS spreads and the cost of debt are much lower after SOX. However, they use a structural CDS pricing model, the CreditGrades model, to examine spreads. In contrast, I investigate the impact of SOX on the relation between CDS market and earnings attributes considered important by analysts and investors and test whether the CDS market captures the information embedded in these attributes.

This paper makes three main contributions. First, it establishes an association between earnings attributes as proxies of information risk and their association with CDS spreads. This demonstrates how earnings attributes signal information about a firm's potential downside risk. Second, I add to the scant financial accounting literature on CDS in the context of SOX. Besides the only paper in this respect by Andrade et al. (2014), I add to this literature by assessing the impact of SOX on the association between CDS spreads and earnings attributes. My findings show how an accounting regulation such as SOX affects the information quality for CDS markets. My results indicate that, with SOX compliance, accounting-based earnings attributes are increasingly relevant as proxies of information risk for the CDS markets. Third, this paper shows a differential impact of SOX compliance for FPIs. SOX seems to have made FPI accounting numbers more useful for the CDS markets, as the FPIs experienced a shift from reporting exemptions to higher disclosure requirements. To the best of my knowledge, this is the first study to show the increased relevance of accounting information for CDS markets for FPIs around SOX.

To conduct my analysis, I first estimate earnings attributes described by Francis et al. (2004) for FPIs and a control group of domestic U.S. firms. Specifically, I compute four accounting-based attributes (accrual quality, persistence, predictability, and smoothness) and three market-based attributes (value relevance, timeliness, and conservatism). Next, to identify the attributes that matter to CDS markets as proxies of information risk, I regress the CDS spreads on the earnings attributes and control variables that determine CDS spreads. To further analyze the impact of SOX, I conduct the regression analysis separately in the pre- and post-SOX fiscal years for the FPIs and U.S. firms.

My results show a strong association between CDS spreads and earnings attributes. I find that, before compliance with SOX, information risk proxies of accounting-based and market-based earnings attributes matter to the CDS markets. However, after SOX, the CDS markets find accounting-based attributes more important. In terms of economic significance, a one percentage decrease in the accrual quality leads to an increase in CDS spreads by 13 basis points. Thus, the overall findings indicate that CDS markets do respond to earnings attributes around capital market regulations such as SOX. Moreover, the results also suggest that this association is stronger for FPIs than for the domestic U.S. firms. This could be because of a higher improvement in information quality for FPIs as they switch from reporting exemptions to higher reporting requirements due to compliance with SOX in comparison to the domestic U.S. firms. These results are robust to difference-in-difference test, an alternative proxy of analyst coverage for information risk, and the exclusion of firms from countries adopting IFRS (International Financial Reporting Standards).

This study has implications for CDS market participants, as it highlights the relevance of information risk measures based on financial accounting information in signalling potential downside risk. Its findings also may matter to investors and analysts, who rely on earnings and earnings-based measures to infer the financial performance of companies. Finally, the

paper speaks to the far-reaching effects of regulation in making accounting-based information more useful via regulation.

The rest of the paper is organized as follows. Section 2 discusses the background on CDS. Section 3 discusses the institutional background of FPIs, literature review, and hypothesis development. Section 4 describes the data and sample selection. Section 5 explains the research design. Section 6 analyzes the results. Section 7 presents further analyses, and Section 8 concludes.

2. What is a CDS

A CDS is an over-the-counter contract between a buyer and a seller whereby they trade a third party's credit risk in relation to an underlying security. The credit-protection buyer (seller), also known as the protection buyer (seller), is usually a financial institution or investment fund. The third party, also known as the reference entity, is not necessarily a party to the contract. The protection buyer pays a fixed premium, usually quarterly payments, to the protection seller until the maturity date of CDS or a default, whichever comes first. In return, the seller gives the security to the buyer. If the third party defaults its payment for the security, the seller agrees to buy the security back from the buyer in return for compensation. This compensation, called "cash settlement," is the difference between the par value of the underlying security and its market value after the default. An alternative to cash settlement is "physical settlement," whereby, in the event of default, the seller repays the amount at par to the buyer in exchange for the physical delivery of the reference asset. If the protection buyer does not hold the reference bond on which risk is traded, then the compensation is usually in the form of cash settlement. However, if the buyer holds the bond, then the buyer receives either cash or physical settlement. Physical settlement is normally preferred over cash

settlement (Blanco et al., 2005). If no default occurs during the maturity of the contract, the buyer continues to pay the swap premium until maturity. The premium paid by the buyer to the seller, called spread, is usually quoted in basis points per annum of the notional value of the contract. The recovery rate after default is calculated by either referencing dealer quotes or implied from market prices observed over some interval after the occurrence of default (Das et al., 2009). Credit events in CDS contracts often include failure to pay, bankruptcy, or restructuring of the reference entity. Figure 1 shows the above discussed mechanism of CDS.

[INSERT FIGURE 1 HERE]

To illustrate the mechanism of CDS using an example, consider two parties entering into a five-year CDS contract on March 1, 2000. Let the notional principal be $100 million. The buyer agrees to pay 90 basis points annually for protection. If the reference entity does not default, then the buyer receives no payoff and pays $900,000 on March 1 of each of the following years: 2001 through 2005. Conversely, if a default occurs and the buyer notifies the seller on Sept. 1, 2003 (halfway through the fourth year), then a substantial payoff is made. If the contract specifies physical settlement, the buyer has the right to sell $100 million par value of the reference entity for $100 million. If the contract specifies a cash settlement, the calculation agent will poll the dealers to determine the mid-market value of the reference obligation, usually a pre-designated number of days after the default. If the value of the reference obligation proves to be $35 per $100 of par value, the cash payoff will be $65 million. In case of either a physical or a cash settlement, the buyer pays the seller the amount of the annual payment accrued between March 1, 2003, and Sept. 1, 2003 (approximately $450,000), but no further payments are made (Hull and White, 2000).

Thus CDS acts as insurance against default on a security. The reference entity could be a private or public firm, a sovereign government, or a government agency. The biggest players

in the CDS market tend to be large commercial banks, insurance companies, and global hedge funds. CDS contracts vary in terms of maturity, ranging from one to 10 years. However, CDS contracts of five-year maturity are considered most liquid. While CDS includes basket CDS and CDS indices (Fabozzi et al., 2007), single-name CDS are the most commonly used credit derivative instrument accounting for nearly half of the credit derivative market's share (Blanco et al., 2005).

A CDS as a derivative instrument offers advantages over corporate bonds and secondary loan markets, which have contributed to its growth over time, especially since the standardization of CDS contracts by the International Swaps and Derivatives Association (Callen et al., 2009). In particular, a CDS differs from other insurance products and financial guaranties in which the buyer is not required to own the underlying security issued by the reference entity to trade protection. A CDS also differs from letters of credit and other derivative instruments as it is traded separately from the underlying assets (Bystrom, 2006). Moreover, the seller has no authority to recover loss from the reference entity. A CDS does not require initial funding, which allows for leveraged positions, and a transaction can be entered into even if a cash bond of the reference entity at a particular maturity is unavailable. Finally, by entering into a contract as a credit-protection seller, an investor can easily create a synthetic short position in the reference entity's credit. Due to these advantages of the CDS over other securities, they are popular among investors.

3. Institutional Setting and Hypothesis

3.1 SEC regulations for FPIs, SOX, and Related Research

The SEC has been granting exemptions to FPIs since 1935 to encourage them to list in the U.S. markets (Shin, 2007). Some of the earliest exemptions relate to Section 14 (proxy rules),

Section 16 (the reporting requirements concerning insider transactions and liability for short swing profits), and quarterly reporting requirements. FPIs are also permitted to disclose only the aggregate compensation paid to executive officers, rather than providing the detailed disclosures of domestic U.S. firms. They file form 20-F, instead of the usual 10-K filed by domestic firms, and receive six months to file these reports, instead of the usual 90 days granted to domestic issuers.[4] FPIs also can file their financial statements either using U.S. Generally Accepted Accounting Principles (GAAP) or reconciling the statements to U.S. GAAP. Furthermore, Rule 144A, a safe harbor provision for the redistribution of restricted securities to qualified institutional buyers (QIBs), was introduced to enable FPIs to access U.S. capital markets through private debt placements. Finally, FPIs are permitted to abide by their home country corporate governance requirements, rather than those of the NYSE or NASDAQ.

Against this background, SOX was passed and implemented. While FPIs had to comply with SOX, the SEC gave them accommodations. They were exempt from the requirement of an independent audit committee under Section 301 and were permitted a delayed compliance date. U.S. firms with a market capitalization of $75 million and above had to comply with SOX regulations beginning with the fiscal year ending on or after Nov. 15, 2004. Filers with a market capitalization below $75 million had to comply beginning with the fiscal year ending on or after July 15, 2005. In contrast, FPIs with a market capitalization above $700 million had to comply with SOX beginning with the fiscal year ending on or after July 15, 2006. Thus there was a delay in the implementation of SOX for FPIs.

Some of the main provisions of SOX that affected U.S. firms and FPIs alike under the Public Company Accounting Reform and Investor Protection Act of 2002 are as follows. Section 302 and Section 906 aim to improve the internal screening procedure to prevent any

[4] See, for example, Burnett et al. (2016) for more details on the 20-F filing requirement.

fraud through declarations from chief executive officer (CEO) and chief financial officer (CFO). Specifically, Section 302 Corporate Responsibility for Financial Reports' requires sworn declarations from senior financial officers taking responsibility for financial reports. Additionally, Section 906 imposes a liability on managers for inaccurate financial reports. Section 303 Improper Influence on Conduct of Audits criminalizes the actions of coercing, manipulating, or misleading a firm's auditors. Section 304 Forfeiture of Certain Bonuses and Profits requires forfeiture of incentive or equity compensation received or stock trading profits made during the 12 months covered by an earnings restatement. Section 401 requires that the pro forma financial information in any periodic or other report filed with SEC should not contain any untrue statement or omission of material facts and that it should be reconciled with the financial condition and results of operations of the issuer under U.S. GAAP.

Thus the focus of SOX was on transparency via enhanced disclosures and stricter enforcement against any misstatements in financial reports and fraud. Its aim was to protect *U.S. investors*. As a result, the law was applied to all firms U.S. investors would invest in, whether domestic U.S. or foreign. However, due to the massive outcry among the capital market participants and intense lobbying by firms, the compliance dates for the implementation of SOX were delayed.

Studies within the financial accounting literature on the CDS markets are scarce compared to those on stock and bond markets. Some of the initial papers in this respect focused on the information used as inputs in CDS pricing models to determine the resulting CDS spreads. In this context, Duffie and Lando (2001) was one of the initial papers developing a hybrid model as a combination of the structural and reduced-form models traditionally used in the pricing of CDS spreads. Although Duffie and Lando (2001) do not include any specific accounting variables in their model, they discuss the possible inclusion of accounting ratios in the generalizations to their model.

Following this approach from Duffie and Lando (2001), instead of using a pricing model, Benkert (2004) conducts a regression analysis of CDS spreads on accounting ratios. Regressing daily five-year CDS spreads on earnings-to-sales and earnings-to-interest, Benkert (2004) finds that earnings variables are significantly and positively related to CDS premia which is a counterintuitive result. Along these lines, using firm quality measures, earnings, and accounting- and market-based ratios, Das et al. (2009) conduct a horserace between accounting-based model and market-based model of CDS spreads. They find that both models perform as well as each other in terms of R^2, but a hybrid model using accounting- and market-based information performs better than the individual models. In the same spirit while investigating the effect of mandatory IFRS adoption on accounting-based prediction models of CDS spreads, Kraft and Landsman (2014) regress CDS spreads on accounting ratios related to firm size, leverage, and profitability. Thus, this section of the CDS literature uses accounting ratios in pricing CDS spreads.

Some other studies within the area rely on more basic accounting information instead of accounting ratios in determining CDS spreads. In this respect, Callen et al. (2009) examine the impact of earnings on CDS spreads and find that earnings are negatively and significantly related to CDS spreads. They also report a similar negative and significant relation between CDS spreads and cash flows and accruals. In a similar vein, Bhat et al. (2014) establish a relation between accounting fundamentals and CDS spreads around IFRS adoption. They find that leverage and in particular earnings and book value of equity are significant determinants of CDS spreads before and after IFRS adoption. These studies place emphasis on accounting fundamentals while analyzing the determinants of CDS spreads.

Besides the above papers, some other papers on CDS focus on the pricing of CDS spreads and while doing so indirectly relate to accounting information or the financial reporting environment. For instance, Bhat et al. (2016) investigate whether IFRS adoption led to an

increase in accounting transparency and the impact of this accounting transparency on the spread/maturity relation of CDS contracts. They find that the IFRS increased accounting transparency and that this led to the slope and concavity of spread/maturity relation to be higher than pre-IFRS adoption. Similarly in the context of accounting regulation, Andrade et al. (2014) examine the impact of SOX on the cost of debt represented by CDS spreads for a sample of U.S. firms. Using a structural pricing model, they find that CDS spreads and hence cost of debt decrease significantly after SOX in comparison to the pre-SOX period.

In contrast to the prior literature on CDS markets in the area of financial accounting, my paper focuses on the information risk measures which are directly relevant to the CDS market participants. Instead of estimating a pricing model of credit risk or alternatively involving accounting ratios, firm quality measures or accounting fundamentals, I use accounting- and market-based earnings attributes which are well-established in prior literature as proxies of information risk. Using these accounting- and market-based earnings attributes, I examine the association between information risk and CDS spreads to identify the measures of information risk that are useful to CDS market participants.

3.2 Hypothesis Development

Earnings attributes convey desirable qualities of earnings, and hence reflect the usefulness of earnings to investors. Prior literature such as Francis et al. (2004) has used earnings attributes as proxies of information risk. For example, attributes such as accrual quality captures variation in the mapping of earnings to operating cash flows and hence is related to information risk. Similarly, more persistent earnings are linked to lower information risk, as investors can infer earnings for the next fiscal year from current fiscal earnings. Prior studies such as Easley and O'Hara (2004) and Lambert et al. (2012) show that firm-specific

information risk is priced by the stock market and cannot be diversified away. Earnings attributes being proxies of information risk can thus signal potential bankruptcy risk which is relevant to CDS market participants. Hence, I expect that information risk will be associated with CDS spreads. Thus I state my first hypothesis below (in the alternative)

H1a: *CDS spreads are associated with information risk as proxied by earnings attributes.*

In the wake of the corporate scandals in 2000 and early 2001, SOX was passed in July 2002, with the aim of restoring investor confidence in the U.S. financial markets (Coates, 2007). One of the primary goals of SOX was shareholder protection via enhanced disclosure and governance requirements (Shin, 2007). In particular, the Act aimed to protect U.S. investors by enforcing stricter rules against any misstatements in financial reports and fraud. The law not only requires increased disclosure of financial information but also written attestations from management. Some of the provisions of SOX involve criminal penalties for managers who commit fraud and requires an independent audit committee to verify reported information. Due to these provisions, managers would be expected to be more cautious in their reporting due to an improvement in enforcement quality after the passage of SOX. As Iliev (2010) and DeFond and Lennox (2011) discuss, such an improvement in enforcement quality would in turn lead to a possible improvement in the quality of information disclosed. As a result the earnings attributes considered in this study are likely to exhibit improvement owing to SOX compliance. Prior literature sheds light in this respect. For instance, Doyle et al. (2007) find that accrual quality is higher post-SOX than in the pre-SOX period. Chambers and Payne (2011) establish that earnings reflect higher persistence after compliance with SOX than before SOX compliance.

Given the nature of SOX and some of its provisions listed above, the information quality of accounting fundamentals such as cash flows, earnings, and accruals is likely to improve

more than that of market-based fundamentals such as returns and stock prices. Accordingly, as the accounting-based earnings attributes are estimated using accounting information such as cash flows, earnings, and accruals, these are likely to experience a higher improvement in information quality than the market-based attributes which are estimated using returns and stock prices. Thus, the accounting-based attributes are likely to exhibit a higher improvement in information quality in comparison to market-based attributes as proxies of information risk. As a result, I expect the accounting-based earnings attributes to be more informative and hence more important to the CDS markets post-SOX relative to the market-based attributes in signalling future bankruptcy risk. However, prior to compliance with SOX, as the enforcement quality and hence information quality is generally lower compared to the post-SOX period, I expect accounting- as well as market-based information to be useful for the CDS market participants as proxies of information risk. This expectation leads to the following hypotheses:

H1b: *CDS spreads respond to accounting- and market-based attributes pre-SOX.*

H1c: *CDS spreads respond more to accounting-based than market-based attributes post-SOX.*

Since 1979, FPIs have been granted several exemptions from disclosure and regulation, compared to domestic firms. For example, they have been exempt from disclosure of quarterly reports, Section 14a-14c proxy rules, Section 14f tender offer rules, and Section 16 short-swing profit rules. This trend continued with the passage of SOX. Although SOX was passed in July 2002, the first set of U.S. firms with a market capitalization above $75 million had to comply for the fiscal year ending on or after November 2004. However, the first set of FPIs with a market capitalization of above $700 million were not required to comply until the fiscal year ending on or after July 15, 2006. This delay for FPIs was partly due to the need for

U.S. markets to continue attracting foreign listings and to avoid driving existing FPIs out of U.S. markets (Davidoff, 2010). However, FPIs differ from domestic U.S. firms in terms of ownership structure, related agency problems, and disclosure patterns (Li, 2014). As a result, any conclusions drawn from earnings attributes of FPIs cannot be automatically extended to U.S. firms and vice versa. As FPIs switch from prior reporting exemptions by SEC to higher disclosure requirements due to compliance with SOX, following from H1a, I expect a stronger association between information risk and CDS spreads than for the domestic U.S. firms. Thus, I state my final hypothesis below:

H2: *The association between information risk proxied by earnings attributes and CDS spreads is stronger for FPIs than for domestic U.S. firms.*

4. Data

American depositary receipts (ADRs) are the main format used for trading the securities of foreign firms in U.S. (Davis, 2009). ADRs can be listed in U.S. at four different levels. Level 1 ADRs trade over the counter. These can be sponsored or unsponsored and require minimal SEC registration. Level 2 ADRs are listed on U.S. exchanges such as NYSE, AMEX, and others. These require registration under 1934 Securities Exchange Act (Exchange Act) and must comply with registration and reporting requirements of the Exchange Act and SEC rules. Level 3 ADRs involve raising capital through a public offering and are subject to the listing and trading rules of U.S. exchanges. They are subject to the registration and reporting requirements of the 1933 Securities Act as well as the Exchange Act and the SEC rules. Finally, Level 4 ADRs are used for raising capital under Rule 144A through private placements and are not subject to SEC rules. SOX is applicable only to foreign companies cross-listed through levels 2 and 3.

I start with the universe of Compustat firms with fiscal year-ends from January 2002 to December 2007. Following Srinivasan et al. (2015), I separate FPIs from domestic firms using the LOC variable from Compustat, which provides data on the country code/headquarters of a firm. This leaves 2,586 FPI firms. Following Iliev (2010), I drop financial firms with SIC>=6000 and SIC<7000, as the financial industry had regulations similar to SOX in place, reducing my sample of FPIs to 2290 firms. Next, I require that FPIs exceed the market capitalization of $700 million for the fiscal year ending on or after July 15, 2005, the year before SOX compliance. This further reduces the sample of FPIs to 442 firms. As the SEC publishes an annual list of FPIs, I verify the FPI status for firms within my sample by manually matching the firm names with SEC's list of FPIs. Out of 442 firms, 316 FPIs from my sample matched the SEC's list. Finally, I further confirm the ADR listing status and country of origin for my sample of FPIs by checking against the Bank of New York Mellon database on ADRs. This is to identify whether the FPIs are level 2 and 3 and subject to SOX. I obtain the accounting and stock market data for computing the earnings attributes measures from Compustat and CRSP, respectively. These are defined in Table A.I in the appendix. As the earnings attributes measures are computed on a 10-year rolling window basis, following Francis et al. (2004), I require non-missing values of the accounting and stock market data for 10 years leading up to the year before and after SOX was implemented for FPIs. I can obtain the required accounting and stock market data on all 316 FPIs. For this final list of FPIs, I obtain CDS data from Datastream. In particular, the data on a firm's annual CDS spread is the mid-price of the bid-ask spread on a senior USD denominated five-year CDS contract on the underlying debt of the firm with modified restructuring clause. As all the firms within the sample do not have CDS contracts traded on their debt, the sample reduces the sample to 117 FPIs. The sample selection procedure discussed above is described in Panel A of Table 1.

Similar to FPIs, I also require data on a control sample of domestic U.S. firms. Separating the list of firms obtained from the CRSP universe using the LOC Compustat variable yields 24,030 U.S. firms. Next, similar to FPIs, I drop financial firms with SIC>=6000 and SIC<7000, reducing the sample to 16,860 U.S. firms. The first set of U.S. firms to comply with SOX had a market capitalization greater than $75 million. Thus, following Zhang (2007), I require that these firms have a market capitalization of more than $75 million in the fiscal year ended 2003, the year before the firms had to comply. This further reduces my sample to 2,875 firms. Next, I match these firms, based on market capitalization and industry, with the sample of 117 FPIs in the fiscal year 2002, the year in which SOX was passed but not implemented for any of these firms. Matching the firms across the two samples allows for more reliable comparison of results later in the analysis, as the FPIs and domestic firms then resemble each other in terms of their characteristics. I finally obtain 117 U.S. firms on which I further obtain accounting and stock market data similar to that required for FPIs from Compustat and CRSP, respectively. Data on CDS spreads is obtained from Datastream.

In addition to estimating the seven earnings attributes, following Francis et al. (2004), I also analyze the change in the innate determinants of these attributes. Data on these attributes—that is, firm size, cash flow variability, sales variability, operating cycle, negative earnings, intangibles intensity, absence of intangibles, and capital intensity—is obtained from Compustat, and the construction of these variables is defined in the Appendix Table A.I. Following Callen et al. (2009), I include firm-level determinants of the likelihood and severity of default, which influence firm-specific CDS spreads, such as market value (*MV*), financial leverage (*Leverage*), the volatility of firm's assets (*SdRet*), the riskless rate of interest (*Spot*), and a firm's short-term S&P credit rating (*Rating*). Following Bhat et al. (2014), I include return on operating assets (*ROA*) as a control variable. These variables are also defined in the Appendix Table A.I. Data for computing *MV*, *Leverage*, and *ROA* is obtained from Compustat.

Data for *SdRet* variable is obtained from CRSP, whereas that for *Spot* is obtained from Federal Reserve Bank of St. Louis H15 Release. In one of the later tests I estimate *Analyst Coverage* proxy. For this purpose, I obtain data on the number of analysts covered on I/B/E/S (Institutional Brokers' Estimate System) that report annual earnings forecasts for the firm in its fiscal year-end month. This data is obtained for FPIs and U.S. firms before and after SOX compliance years.

Table 1 presents the sample selection procedure for FPIs in Panel A, whereas Panel B of the table presents the distribution of the sample FPIs by country and their average (median) market capitalization. As evident from the table, the maximum number of FPIs listing in the U.S. comes from Canada, the United Kingdom, and France. Although all other countries listed in the table have only a few firms cross-listing in the U.S., the sample includes firms from 26 countries. The FPIs are all big in terms of market capitalization, with Japanese firms having the highest average and median market capitalization. An FPI from Singapore has the lowest market capitalization across sample firms.

[INSERT TABLE 1 HERE]

5. Research Design

5.1. Estimation of Earnings Attributes as Proxies of Information Risk

I follow Francis et al. (2004) in the choice and estimation of the earnings attributes. As a first step, I estimate the earnings attributes for pre- and post-SOX periods for the FPIs and domestic U.S. firms. The estimation of these attributes has been detailed in the Appendix A.

5.2. Association between Credit Risk and Earnings Attributes

After estimating the earnings attributes for FPIs and U.S. firms, I next examine the relation between CDS spreads and information risk proxied by earnings attributes. To evaluate the response of credit risk markets to SOX compliance, I regress the CDS spreads, reflecting credit risk, on each of the seven earnings attributes discussed earlier. In the process, I control for the determinants of CDS spreads motivated by prior literature (Callen et al., 2009; Bhat et al., 2016), namely, market value at the end of previous fiscal year (*MV*), credit rating (*Rating*), leverage (*Leverage*), return volatility (*SdRet*), profitability (*ROA),* and the risk-free interest rate (*Spot*). The construction of these control variables is described in the Appendix Table A.I. Theoretically, the higher the profitability and firm size the lower the CDS spreads. Conversely, the higher the *Leverage*, return volatility (*SdRet*), and *Rating* number (lower quality), and the risk-free rate in the country (*Spot*) the higher the CDS spreads.

I estimate the association between CDS spreads and earnings attributes as proxies of information risk for a panel data of FPIs across pre- and post-SOX years as follows:

$$CDS_{j,t} = \alpha + \beta_i EA_{i,j,t} + \delta Controls_{j,t} + \varepsilon_t, \quad (1)$$

where CDS denotes CDS spreads divided by 100 for firm j in year t, $EA_{i,j,t}$ denotes the earnings attributes i for firm j in year t with i=7 as I estimate seven earnings attributes. $Controls_{j,t}$ are the control variables for firm j in year t discussed earlier and defined in Appendix Table A.I. I first estimate equation (1) as panel data. Following this, I also conduct cross-sectional regressions for all firms j in the pre- and post-SOX fiscal years separately. In doing so, I use each of the seven earnings attributes, one at a time, in an additional regression including all seven earnings attributes along with the control variables. I repeat the above panel and cross-sectional estimations for domestic U.S. firms in addition to those for the FPIs.

The panel estimation of equation (1) directly tests hypothesis H1a by examining the association between CDS spreads and information risk in the form of earnings attributes. Further, estimating equation (1) cross-sectionally pre- and post-SOX tests hypotheses H1b and H1c respectively. Comparing the results across from panel and cross-sectional estimation of equation (1) for FPIs with those of the U.S. firms addresses hypothesis H2.

5.3. Difference-in-difference

After estimating equation (1) on a panel data basis and then cross-sectionally pre- and post-SOX, I perform a difference-in-difference test as part of the main analysis in order to further verify the results. In particular, I estimate the following equation

$$CDS_{j,t} = \alpha + \beta_1 FPI_j + \beta_2 Post_j + \beta_{3,i} EA_{i,j,t} + \beta_{4,i} EA_{i,j,t} \times FPI \times Post_j + \beta_{5,i} EA_{i,j,t} \times FPI_j + \beta_{6,i} EA_{i,j,t} \times Post_j + \beta_7 FPI \times Post_j + \delta Controls_{j,t} + \varepsilon_t \quad (2)$$

where *FPI* is a dummy that takes the value 1 for FPIs and 0 for domestic U.S. firms and *Post* is a dummy that takes the value 1 for post-SOX (2004 for U.S. and 2006 for FPIs) and 0 for pre-SOX (2003 for U.S. and 2005 for FPIs) compliance fiscal years. Earnings attributes and control variables are as defined in equation (1).

Estimating equation (2), I obtain,

For FPIs, the change in the loading on *EA* for pre-SOX period as:

$$E(CDS \mid FPI\_pre) = \alpha + \beta_1 + \beta_3 + \beta_5 \quad (3a)$$

For FPIs, the change in the loading on *EA* for post-SOX compared to pre-SOX as:

$$E(CDS \mid FPI\_post) = \alpha + \beta_1 + \beta_3 + \beta_5 + \beta_2 + \beta_4 + \beta_6 \quad (3b)$$

Equations (3a) minus (3b) = $\beta_2 + \beta_4 + \beta_6$ which measures the effect of post- versus pre-SOX for FPIs.

$$E(CDS \mid US\_pre) = \alpha + \beta_3 \quad (3c)$$

$$E(CDS \mid US\_pre) = \alpha + \beta_2 + \beta_3 + \beta_6 \quad (3d)$$

Similarly, Equations (3c) minus (3d) = $\beta_2 + \beta_6$ which measures the effect of post- versus pre-SOX for U.S. firms.

Further, Difference (Equations 3a minus 3b) of difference (Equations 3c minus 3d) = β_4. Thus, β_4 finally measures how the loading on a given earnings attribute for FPIs changes for post- versus pre-SOX period with U.S. firms as the base. Thus, the main variable of interest from difference-in-difference approach is β_4. I expect this coefficient to be significant for the accounting-based earnings attributes more than for the market-based attributes given that the accounting-based attributes are expected to change more significantly for FPIs than for the U.S. firms in the post- compared to pre-SOX period, consistent with the hypotheses.

5.4. Alternative measure of information risk

In this part of the analysis, I use an alternative proxy for information risk to the accounting- and market-based proxies used so far in the study. Prior studies such as Zhang (2006) implement analyst coverage as a proxy for information uncertainty in the context of price continuation anomalies and cross-sectional variations in stock returns. In the same spirit, in order to validate an association between CDS spreads and information risk, I use analyst coverage as a proxy for information risk. Specifically, I estimate the following equation:

$$CDS_{j,t} = \alpha + \beta\ AnalystCoverage_{j,t} + \delta Controls_{j,t} + \varepsilon_t \quad (4)$$

where *AnalystCoverage* for a firm-year refers to the number of analysts covered on I/B/E/S that report annual earnings forecasts for the firm in its fiscal year-end month. I expect the coefficient for *AnalystCoverage* to be negative as a higher number of analysts following a stock will imply lower information risk and thus lead to lower CDS spreads.

5.4. Firms from IFRS adopting countries

Although the FPIs come from a broad range of countries, as evident from Table 1, Panel B, most of these countries might have adopted IFRS in 2005. This was just a year before the FPIs from these home countries complied with SOX in U.S. for the fiscal year ending on or after July 15, 2006. In order to avoid any bias in the results concerning the association between CDS spreads and information risk, in this section of the research design I drop firms from countries that adopted IFRS around SOX compliance date.[5] This leaves me with 45 FPIs from Brazil, Canada, India, Israel, Japan, Mexico, and South Korea. I repeat the previous analysis conducted for the full sample of FPIs for these 45 firms by re-estimating equation (1) on a panel data across 2005 (pre-SOX compliance) and 2006 (post-SOX compliance) fiscal years. Following this, I also conduct cross-sectional analysis separately for the pre-SOX fiscal year of 2005 and post-SOX of 2006 for these 45 firms.[6] I expect to find stronger results compared to those obtained from the full sample of FPIs in terms of economic and statistical significance of the association between CDS spreads and earnings attributes around SOX.

[5] The IFRS adoption dates for home countries of the FPIs within the sample have been obtained from Table 4 of De George et al. (2016).

[6] I bootstrap the standard errors to mitigate small sample bias while conducting the panel data estimation. In the cross-sectional estimation however, I cluster the standard errors by firm identifier.

6. Results

Table 2 presents the means and medians of CDS spreads and firm quality variables for pre- and post-SOX compliance years for the FPIs and U.S firms. In Panel A for FPIs, the CDS spreads are lower post-SOX. This is consistent with Andrade et al. (2014) where they find that CDS spreads are much lower after compliance with SOX than before. Similarly, the firm size, leverage, market value, return on assets, cash flow and sales variability, and capital intensity differ significantly across the pre- (2005) and post- (2006) SOX years. These factors indicate improvements in firm characteristics after SOX, with an increase in firm size and *ROA*, a decrease in *Leverage* and a decline in cash flow and sales variability accompanied by an increase in *Rating*. However, other factors concerning R&D and advertising expenditures reflected in intangibles intensity and operating cycle remain similar from before to after SOX. Only the stock market volatility (*Sdret*) increases and this increase is statistically significant. This observation is consistent with the literature (Iliev, 2010; Litvak, 2007; Li, 2014) documenting a negative stock market reaction to the passage of SOX.

Table 2 Panel B presents similar results for domestic U.S. firms. Similar to FPIs, the CDS spreads decrease and the difference is statistically significant. Most of the firm characteristics show similar significant changes as those for FPIs, such as firm size, cash flow variability, *ROA*, *Leverage*, *Rating*, volatility of stock returns (*SdRet*), and market value (*MV*). In this respect, the FPIs and U.S. firms seem to be possessing similar characteristics.

[INSERT TABLE 2 HERE]

Next, Table 3 presents the panel data regression results examining an association between CDS spreads and earnings attributes as proxies of information risk. These results are obtained from estimating equation (1) and thus tests hypothesis H1a. Panel A presents the results for FPIs and Panel B presents the results for U.S. firms. Comparing the results across the two

panels tests hypothesis H2. For FPIs, I observe from Column 1 that the accounting-based earnings attributes of *AccrualQuality* is useful to the CDS markets as a proxy of information risk. The coefficient value of 13.606 indicates that a one percentage change in *AccrualQuality* increases the CDS spreads by a unit of 13.606 basis points.[7] This is highly economically significant, compared to the work of Callen et al. (2009), who find a similar association between CDS spreads and an ROA of 5 to 6 basis points. The *AccrualQuality* attribute is positive and statistically significant, implying an increase in *AccrualQuality* leads to an increase in the CDS spreads. However, an increase in *AccrualQuality* implies poor quality accruals, as, by construction, larger (smaller) values imply poor (good) quality accruals. Thus a positive coefficient indicates a decrease in accrual quality, which leads to an increase in CDS spreads. This is consistent with the intuition that poor quality reported accruals would lead to an increase in the risk reflected in CDS spreads. Besides *AccrualQuality*, the accounting-based attribute of *Smoothness* (Column 4) and market-based attributes of *Relevance* (Column 5) and *Conservatism* (Column 7) are also positive and statistically significant in influencing CDS spreads. Similar to *AccrualQuality* the positive sign for these proxies indicates an increase in *Smoothness, Relevance,* and *Conservatism* values implies less smooth, less relevant, and less conservative earnings which are each in turn associated with higher CDS spreads and risk. When all seven proxies of information risk are pooled together in one regression, I find from Column 8 that the attributes, namely, *AccrualQuality, Smoothness, Relevance,* and *Conservatism* are still statistically significant in influencing CDS spreads. In fact the economic significance of *AccrualQuality* and *Relevance* proxies increases in this joint regression CDS spreads on all earnings attributes. Thus, the CDS market seems

[7] Similar to Callen et al. (2009), I analyze economic significance by measuring the dependent variable as a percentage (number of basis points divided by 100). As Callen et al. (2009) state, this specification is more convenient for estimating the economic impact because the coefficients of the independent variables represent the impact of 1 percent change in the variables on CDS premia (in basis points).

to find the accounting- and market-based proxies of information risk useful in determining the CDS spreads.

Similarly to the results for FPIs, the association between CDS spreads and information risk is evident from Panel B for U.S. firms. The results suggest that the accounting-based earnings attribute of *Smoothness* (Column 4) and market-based attribute of *Relevance* (Column 5) are important to the CDS markets as proxies of information risk. These attributes are positive and highly statistically significant and they continue to be influential in determining the CDS spreads when pooled together with the other earnings attributes proxies as evident from Column 8.

Comparing across Panel A and B, the coefficients on the statistically significant earnings attributes are in general economically and statistically more significant for FPIs than U.S. firms, thus proving hypothesis H2. For example, the coefficient on *Smoothness* is 0.532 (0.312) for FPIs (U.S. firms) in Column 4 of Panel A (Panel B). Across Panels A and B, the control variables exhibit consistent behaviour except the *ROA* and the risk-free interest rate (*Spot*). Among the control variables, the signs are consistent with prior studies (Callen et al. 2009). Specifically, a decrease in market value and *ROA* and an increase in *Leverage, Spot* and stock volatility (*SdRet*) would lead to an increase in risk and hence CDS spreads. Similarly, an increase in ratings indicates poorer quality ratings, which would cause higher risk reflected in higher spreads. *Leverage*, volatility of daily stock returns (*SdRet*), and, in some cases, *Rating* are statistically significant across all the columns for FPIs and U.S. firms. Although *ROA* is significant for determining the CDS spreads for FPIs, *Spot* is influential in determining CDS spreads for U.S. firms. The adjusted R^2s are quite high and within a given range for both FPIs and U.S. firms.

Overall, Table 3 suggests that hypothesis H1a holds and that there exists a strong association between CDS spreads and earnings attributes as proxies of information risk, both for FPIs and for U.S. firms. Comparing the economic and statistical significance of the attributes across Panels A and B indicates that hypothesis H2 holds.

[INSERT TABLE 3 HERE]

Table 4 presents the results for the cross-sectional regression of CDS spreads on the earnings attributes in the pre-SOX fiscal years and directly tests hypothesis H1b. Panel A (Panel B) presents these results for FPIs (U.S. firms) in 2005 (2003) for pre-SOX compliance fiscal year. Similar to Table 3, each column in both the panels includes one earnings attribute at a time with all the control variables, whereas column 8 includes all earnings attributes along with all the controls.[8] Panel A indicates that for the FPIs *AccrualQuality* (Column 1), *Smoothness* (Column 4), *Relevance* (Column 5), and *Conservatism* (Column 7) attributes are positive and statistically significant. Thus, these information proxies of accounting- and market-based attributes are influential in determining the CDS spreads. When all seven attributes are pooled in one model, *AccrualQuality*, *Relevance*, and *Conservatism* remain statistically significant. Among the seven attributes *AccrualQuality* (Column 1) has the highest economic significance, whereas *Conservatism* (Column 7) has the lowest. The coefficient value of 11.305 indicates that a one percentage change in *AccrualQuality* increases the CDS spreads by a unit of 11.305 basis points.

For domestic U.S. firms in Panel B, I find that, among the attributes, only *Smoothness* and *Relevance* are statistically significant when considered in isolation (Columns 4 and 5, respectively). However, when pooled with other attributes, in addition to *Smoothness* and

[8] The control variable, *Spot*, drops outs of the cross-sectional regressions because of multicollinearity. Also, because this is a T-bill rate for the U.S., it doesn't vary by firm in the cross-sectional regression. Hence this variable is not reported in the results for FPIs and U.S. firms.

Relevance, *AccrualQuality*, and *Conservatism* are also positive and statistically significant (Column 8). Comparing across Panel A and B, similar to panel estimation in Table 3, the coefficients on the statistically significant earnings attributes are in general economically and statistically more significant for FPIs than U.S. firms, thus again validating hypothesis H2.

Among the control variables across FPIs (Panel A) and U.S. firms (Panel B), similar to Table 3, the signs are consistent with prior studies (Callen et al. 2009). Specifically, a decrease in market value and *ROA* and an increase in *Leverage* and stock volatility (*SdRet*) would lead to an increase in risk and hence CDS spreads. Similarly, an increase in ratings indicates poorer quality ratings, which would cause higher risk reflected in higher spreads. *Leverage*, volatility of daily stock returns (*SdRet*), and, in some cases, *Rating* are statistically significant across all the columns for FPIs whereas for U.S. firms only *Leverage* and *SdRet* are statistically significant. The adjusted R^2 stays high and within a given range for both FPIs and U.S. firms.

In summary, before SOX, in 2005 (2003) fiscal year for FPIs (U.S. firms), *AccrualQuality*, *Smoothness*, *Relevance*, and *Conservatism* are important proxies of information risk for the CDS markets. Thus, consistent with hypothesis H1b, in the pre-SOX compliance period the accounting- and market-based earnings attributes are useful as proxies of information risk to the CDS markets. Again comparing the economic and statistical significance of these attributes across Panels A and B indicates that in general hypothesis H2 holds.

[INSERT TABLE 4 HERE]

Table 5 presents similar results for post-SOX compliance for FPIs (Panel A) and U.S. firms (Panel B) in the fiscal years 2006 (2004). Overall Table 5 tests hypothesis H1c, whereas comparing the results across Panel A and Panel B addresses hypothesis H2.

Panel A shows that, for FPIs in the post-SOX period, the CDS markets respond to *AccrualQuality* (Column 1), *Smoothness* (Column 4), and *Conservatism* (Column 7) measures. These attributes continue to be positive and statistically significant when all attributes are pooled together in Column 8. However, compared to the market-based attribute of *Conservatism* (Column 7), the accounting-based attributes of *Accrual Quality* (Column 1) and *Smoothness* (Column 4) are more economically and statistically significant in case of FPIs (Panel A). Similar inferences can be drawn by analyzing the economic and statistical significance of these attributes from Column 8 when all attributes are pooled together.

Panel B presents similar results for U.S. firms where the CDS markets respond to *AccrualQuality*, *Smoothness*, and *Relevance* attributes. This observation holds not only when these proxies are considered in isolation but also when pooled together in Column 8, Panel B. However, similar to the observation for FPIs, the market-based attribute of *Relevance* is economically and statistically less significant than the accounting-based attributes of *AccrualQuality* and *Smoothness*. Thus, although accounting- and market-based proxies of information risk are significant in influencing CDS spreads, post-SOX the CDS markets seem to be finding the accounting-based proxies of information risk more useful than the market-based proxies.

In the post-SOX period, for FPIs stock volatility (*SdRet*) and *ROA* are statistically significant, whereas *Leverage* and *MV* are marginally significant in some cases. In case of U.S. firms, *Rating* in addition to *Leverage* and *SdRet* is statistically significant after SOX in determining CDS spreads. The adjusted R^2 stays high and within a given range for both FPIs and U.S. firms.

Thus, in the final analysis, SOX seems to have caused a change in the association between CDS spreads and earnings attributes as a proxy for information risk by making the

accounting-based proxies of information risk more informationally relevant to the CDS markets post-SOX. Again comparing the economic and statistical significance of these attributes across Panels A and B indicates that in general hypothesis H2 holds as the results for FPIs are stronger than for the domestic U.S. firms.

[INSERT TABLE 5 HERE]

To further confirm this comparison across pre- (Table 4) and post-SOX (table 5) periods for FPIs relative to U.S. firms, I conduct difference-in-difference test. Specifically, I estimate equation (2). The results of the changes analysis from estimating equation (2) are presented in Table 6. The main variable of interest in this table is β_4, the coefficient for the interaction term between earnings attribute, FPI, and post-SOX period (EA × FPI × Post). Analyzing the results from this table, it becomes apparent that this coefficient is positive and statistically significant for *AccrualQuality* and *Smoothness* attributes. This implies that the loading on *AccrualQuality* and *Smoothness* for FPIs versus U.S. firms in the post-SOX compared to pre-SOX period is statistically significant and hence influential for the CDS markets. In comparison, this coefficient β_4 is not significant for any of the market-based attributes. This further proves the hypotheses H1b, H1c, and H2. Besides the main coefficient of interest, the coefficients for controls seem to be consistent with the results in previous tables. Also the adjusted R^2 seems high and comparable to the corresponding values reported in previous tables.

Thus, overall the difference-in-difference analysis seems to be confirming the results from Tables 3, 4, and 5 and thus proving hypotheses by establishing that the accounting-based earnings attributes as proxies of information risk are more informationally relevant to CDS markets than the market-based attributes for FPIs compared to U.S. firms.

[INSERT TABLE 6 HERE]

Next, in order to validate the association between CDS spreads and information risk evident from Table 3, I employ an alternative proxy for information risk in the form of analyst coverage. This proxy refers to the number of analysts covered on I/B/E/S that report annual earnings forecasts for the firm in its fiscal year-end month. Table 7 presents the results from a panel estimation of equation (4), estimated separately for FPIs and U.S. firms. The results indicate that the coefficient for *AnalystCoverage* proxy is negative and statistically significant for both, U.S. firms and FPIs. This implies that as a higher number of analysts follow a stock, the lower would be the information risk and thus lower the CDS spreads. Besides the main variable of interest, the *AnalystCoverage* proxy, the coefficients for controls seem to be consistent with the results in previous tables. Also the adjusted R^2 seems high and comparable to the corresponding values reported in previous tables. Thus overall, these results confirm the association between CDS spread and information risk.

[INSERT TABLE 7 HERE]

The final table in the analysis, Table 8, presents the results corresponding to Tables 3, 4, and 5 (Panel A only) after excluding the FPIs from countries adopting IFRS in 2005. This leaves me with 45 FPIs from Brazil, Canada, India, Israel, Japan, Mexico, and South Korea. The overall results from Panel A (Panels B and C) of this table are consistent with those of Panel A, Table 3 (Tables 4 and 5). In particular, Panel A of this table suggests that the accounting- and market-based earnings attributes are statistically significant in influencing CDS spreads for panel data estimation across pre- and post-SOX periods. This proves hypothesis H1a. Panel B of the table indicates that pre-SOX the accounting-based (*AccrualQuality*) and market-based (*Conservatism*) attributes of information risk are significant in determining CDS spreads, consistent with hypothesis H1b. Panel C however, shows that post-SOX the accounting-based (*AccrualQuality* and *Smoothness*) attributes are

more significant economically and statistically than the market-based (*Conservatism*) attributes of information risk, consistent with hypothesis H1c. Thus overall, the results from excluding the FPIs from countries adopting IFRS in 2005 are consistent with those in the previous analysis.

[INSERT TABLE 8 HERE]

7. Further Analysis

This section discusses possible additional tests to supplement the main analysis. The current main analysis focuses on the association between CDS spreads and information risk. This association between CDS spreads and earnings attributes around SOX has been analyzed across FPIs and a control group of domestic U.S. firms. However, an alternative control group, similar to that used by Litvak (2007), would be firms of similar size from same industry but from the home country of the corresponding FPI. These firms would not be subject to SOX, as they operate outside the U.S. As a result, analyzing the association between CDS spreads and earnings attributes of FPIs around SOX against a control group of size- and industry-matched home country firms would build more confidence in the results from the main analysis. Using difference-in-difference approach across the main sample of FPIs and the sample of home country firms might be a more robust test of the association between CDS spreads and information risk around SOX.

Some of the FPIs may have voluntarily adopted SOX earlier than their mandatory compliance date. As evident from Table 1 Panel B, as the firms within the sample are large firms in terms of their market capitalization; they could have adopted SOX early. Repeating the main analysis after dropping voluntary early adopters would be useful in verifying the main analysis. Additionally, the analysis can be repeated for a subsample of voluntary adopters to observe any different patterns in the form of higher improvement in earnings

attributes, lower CDS spreads or both post-SOX as a positive reaction by credit risk markets to early compliance with the impending regulation.

An alternative method of confirming the results from main analysis would be to perform an event study, where I could examine the reaction to SOX implementation events.[9] Unlike prior literature, however, analyzing the reaction of stock markets using abnormal returns, I would instead analyze the movement in CDS spreads around the SOX announcement dates. This would be a short-window analysis supplementing the findings from the main analysis.

Following the literature examining the association between earnings and CDS spreads, such as Callen et al. (2009), Bhat et al. (2014), and Bhat et al. (2016), I could further examine whether the association between CDS spreads and earnings attributes pre- and post-SOX is asymmetric across firms above and below median earnings. In addition, I could explore the asymmetry in terms of above and below median credit ratings of sample FPIs. This might reveal interesting patterns in the association between CDS spreads and earnings attributes owing to SOX compliance.

Similar to Bhat et al. (2016), I could also estimate the concavity and slope of the Duffie and Lando (2001) model. The analysis would focus on investigating whether SOX increases the slope, concavity, or both between the CDS spreads and maturity. This would require obtaining a longer time series of CDS spreads on contracts of all maturities issued by the sample FPIs instead of only the five-year CDS contract, which is of focus in the main analysis.

[9] See for example prior literature, such as Litvak (2007), Zhang (2007), Iliev (2010), and Li (2014).

8. Conclusion

This study examines the association between earnings attributes as proxies of information risk and CDS spreads for FPIs around SOX compliance. Prior literature, such as by Callen et al. (2009), has shown that earnings are the main source of information for the CDS markets. However, it is unclear how the riskiness of this information, as measured by earnings attributes, impacts CDS spreads. As information risk is non-diversifiable and has been shown to impact pricing decisions in the stock market (Easley and O'Hara, 2004; Lambert et al., 2012; Francis et al., 2004), I expect that it will be associated with CDS spreads.

I compute four accounting-based attributes (accrual quality, persistence, predictability, and smoothness) and three market-based attributes (value relevance, timeliness, and conservatism) and identify the attributes that matter to CDS markets as proxies of information risk. For this purpose, I regress the CDS spreads on earnings attributes and control variables that determine CDS spreads. To assess the impact of SOX, I conduct the regression analysis separately in the pre- and post-SOX fiscal years for the FPIs and U.S. firms.

My results show a strong association between CDS spreads and information risk. I find that, before compliance with SOX, information risk proxies of accounting-based and market-based earnings attributes matter to the CDS markets. However, after SOX, the CDS markets find the accounting-based attributes relatively more important than the market-based ones. In terms of economic significance, a one percentage decrease in the accrual quality leads to an increase in CDS spreads by 13 basis points. Thus my overall findings indicate that CDS markets use earnings attributes as proxies of information risk and that this relationship is affected by accounting regulations such as SOX. I also find that this association is stronger for FPIs than for the domestic U.S. firms. This could be because of a higher improvement in

information quality for FPIs, as they switch from reporting exemptions to higher reporting requirements due to compliance with SOX.

This study highlights the relevance of information risk measures based on financial accounting information in signalling downside risk to CDS markets. Its findings may matter to investors and analysts, who rely on earnings and earnings-based measures to infer the financial performance of a company. The findings may also illuminate how accounting-based information can be improved by regulations such as SOX.

I do not conduct a cost-benefit analysis in terms of the extent of usefulness of the information risk proxies for the CDS markets. This could be the focus of future research. Subsequent studies could examine whether a substitution effect exists between the accounting-based and market-based proxies in explaining bankruptcy. They could include more proxies of information risk and conduct a horserace between the different proxies to identify measures that are most useful in identifying the potential downside risk of a firm.

APPENDIX A

Estimation of Earnings Attributes of Accounting Quality

Following the sample selection, I estimate earnings attributes of accounting quality for all sample firms. As stated in Francis et al. (2004), prior accounting literature and practice characterize these seven earnings attributes as desirable characteristics of earnings. They comprise of four accounting-based measures: accrual quality, persistence, predictability, and smoothness; and three market-based measures: relevance, timeliness, and conservatism. The measures of accrual quality, persistence, predictability, and smoothness are constructed using a firm's cash flow, earnings, or accruals information and hence are categorized as accounting-based measures. However, the market-based measures of relevance, timeliness, and conservatism are constructed using a firm's returns or prices and hence categorized as market-based. I construct the seven measures of earnings attributes following Francis et al. (2004) as follows.

The accrual quality measure is based on Dechow and Dichev's (2002) model using current accruals, and lagged, current, and future cash flows from operations as follows:

$$\frac{TCA_{j,t}}{Assets_{j,t}} = \varphi_{0,j} + \varphi_{1,j}\frac{CFO_{j,t-1}}{Assets_{j,t}} + \varphi_{2,j}\frac{CFO_{j,t}}{Assets_{j,t}} + \varphi_{3,j}\frac{CFO_{j,t+1}}{Assets_{j,t}} + \nu_{j,t} \qquad \text{(A.1)}$$

where $TCA_{j,t}$ are firm *j*'s total current accruals in year *t*, estimated as $\Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t}$. $\Delta CA_{j,t}$ represents firm *j*'s change in current assets (Compustat item # 4) between year *t* and *t-1*, $\Delta CL_{j,t}$ equals firm *j*'s change in current liabilities (Compustat item # 5) between year *t* and *t-1*, $\Delta Cash_{j,t}$ represents firm *j*'s change in cash (Compustat item # 1) between year *t* and *t-1*, and $\Delta STDEBT_{j,t}$ equals firm *j*'s change in debt in current liabilities (Compustat item # 34) between year *t* and *t-1*. In equation (A.1),

$Assets_{j,t}$ represent average total assets in year *t* and *t-1*, and $CFO_{j,t}$ equals cash flow from operations for firm *j* in year *t*, calculated as net income before extraordinary items (*NIBE*, Compustat item # 18) less total accruals (*TA*) where $TA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STDEBT_{j,t} - DEPN_{j,t}$ and $DEPN_{j,t}$ represents firm *j*'s depreciation and amortization expense (Compustat item # 14) in year *t*. Estimating equation (A.1) yields ten firm- and year-specific residuals, $\nu_{j,t}, t = t-9, t-8, ..., t$. $AccrualQuality_{j,t} = \sigma(\hat{\nu}_{j,t})$. Large (small) values of *AccrualQuality* represent poor (good) accrual quality.

Although Francis et al. (2004) estimate equation (A.1) on a ten-year rolling window basis, I estimate accrual quality measure over a ten-year window instead. As Francis et al. (2004) require a time-series of earnings attributes measures; they estimate each of the seven measures on a ten-year rolling window basis. However, I only require cross-sectional estimates of earnings attributes for my further analysis involving credit risk. As a result, I estimate each measure of earnings attribute on a ten-year window similar to Francis et al. (2004), except for their rolling method of estimation. Specifically, I estimate the earnings attributes for FPIs for the year 2005 (pre-SOX) and 2006 (post-SOX) and for the domestic U.S. firms for the year 2003 (pre-SOX) and 2004 (post-SOX) implementation. As a result, for FPIs, I estimate the accrual quality measure and other earnings attributes over a window extending from 1996 (*t-9*) to 2005 (*t*) pre-SOX and 1997 (*t-9*) to 2006 (*t*) post-SOX. Similarly, the window for control sample of domestic firms extends from 1994 (*t-9*) to 2003 (*t*) pre-SOX and 1995 (*t-9*) to 2004 (*t*) post-SOX.

Next, I estimate the persistence measure. Again following Francis et al. (2004), I measure earnings persistence as the slope coefficient estimate from an autoregressive model of lag order one, AR (1). This is estimated as follows.

$$X_{j,t} = \phi_{0,j} + \phi_{1,j} X_{j,t-1} + \nu_{j,t} \quad \text{(A.2)}$$

where $X_{j,t}$ equals firm *j*'s net income before extraordinary items in year *t* divided by the weighted average number of outstanding shares during year *t*. Estimating equation (A.2) using maximum likelihood estimation yields firm- and year-specific estimates of the AR (1) coefficient, $\phi_{1,j}$. For each firm, I estimate equation (A.2) using a ten-year window to obtain the persistence estimates for the fiscal years 2005 and 2006 for FPIs and fiscal years 2003 and 2004 for domestic U.S. firms. The closer the value of the AR (1) coefficient to 1 (0) the more persistent (transitory) are the earnings over time. Similar to Francis et al. (2004), I obtain negative of the AR (1) coefficient such that larger (smaller) values of *Persistence* reflect less (more) persistent earnings. Thus, *Persistence*= - $\phi_{1,j}$.

The next earnings attribute, *Predictability*, is also estimated from equation (A.2). Specifically, *Predictability* equals the square-root of the error variance from the estimation of equation (A.2). Thus, *Predictability*= $\sqrt{\sigma^2(\hat{v}_j)}$. Similar to *AccrualQuality* and *Persistence*, I estimate the *Predictability* measures per firm for 2005 and 2006 fiscal years for FPIs and 2003 and 2004 fiscal year for the control sample. The final accounting-based earnings measure of *Smoothness* is a variance-based measure, defined as the ratio of firm *j*'s standard deviation of net income before extraordinary items divided by beginning of the fiscal year total assets to standard deviation of the firm's cash flows from operations divided by beginning of fiscal year total assets. These standard deviations are computed over a ten-year window. Thus, *Smoothness*= $\sigma(NIBE_{j,t}) / \sigma(CFO_{j,t})$. Larger (smaller) values of this measure reflect more (less) smooth earnings over time.

Now turning to the market-based earnings attributes, as stated in Francis et al. (2004). The first of these attributes, *Relevance*, explains variability by regressing firm-specific returns on the level and changes in earnings. This is shown as follows.

$$RET_{j,t} = \delta_{0,j} + \delta_{1,j} EARN_{j,t} + \delta_{2,j} \Delta EARN_{j,t} + \zeta_{j,t} \quad \text{(A.3)}$$

where $RET_{j,t}$ equals firm *j*'s 15-month return ending three months after the end of fiscal year *t*, $EARN_{j,t}$ equals firm *j*'s income before extraordinary items in year *t* (*NIBE*) scaled by market value at the end of year *t-1*, and $\Delta EARN_{j,t}$ represents change in firm *j*'s *NIBE* in year *t*, scaled by market value at the end of year *t-1*. I estimate equation (A.3) over a ten-year window from 1996-2005 (1994-2003) pre-SOX and 1997-2006 (1995-2004) post-SOX for FPIs (control firms). Following Francis et al. (2004), I take negative of the adjusted R^2 from equation (3) as a measure of value relevance. Thus, *Relevance*= $-R^2_{j,t}$ from equation (A.3). Large (small) values of *Relevance* reflect earnings which are less (more) value relevant.

Next, I estimate a measure of *Timeliness*. This measure is obtained from a regression where earnings are the dependent variable and returns become the independent variables as shown below:

$$EARN_{j,t} = \alpha_{0,j} + \alpha_{1,j} NEG_{j,t} + \beta_{1,j} RET_{j,t} + \beta_{2,j} NEG_{j,t} \cdot RET_{j,t} + \varsigma_{j,t} \quad \text{(A.4)}$$

where $NEG_{j,t} = 1$ if $RET_{j,t} < 0$, and 0 otherwise. Other variables are as defined in equation (A.3). Similar to the *Relevance* measure, *Timeliness* is based on the explanatory power of equation (A.4). Thus, *Timeliness*= $-R^2_{j,t}$, is negative of adjusted R^2 from the estimation of equation (A.4) over a ten-year window. Large (small) values of *Timeliness* reflect earnings which are less (more) timely.

The final market-based earnings attribute, *Conservatism*, is also obtained from the estimation of equation (A.4). Similar to Francis et al. (2004), I estimate this measure as negative of the ratio of coefficient on bad news to the coefficient on good news. Thus, $Conservatism = -(\beta_{1,j} + \beta_{2,j}) / \beta_{1,j}$. Large (small) values of the *Conservatism* measure reflect less (more) conservative earnings.

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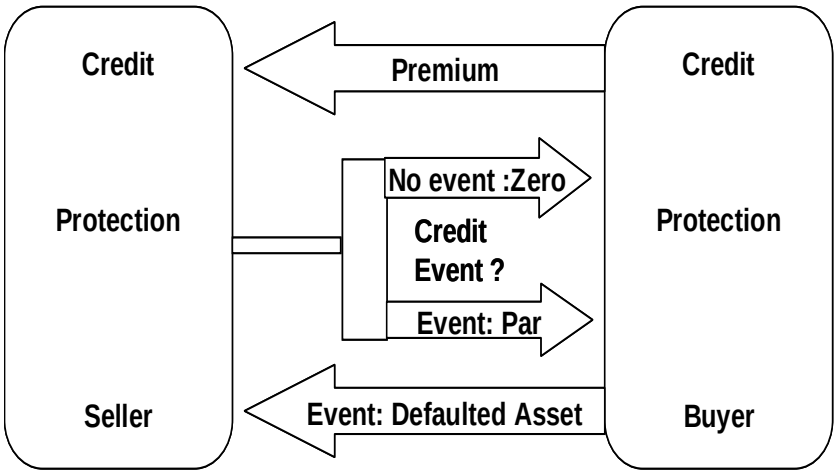
FIGURE 1

DEFINITION OF CREDIT DEFAULT SWAPS



Source: Eales (2007).

TABLE 1

SAMPLE SELECTION AND DISTRIBUTION BY COUNTRY

This table presents the sample selection procedure in Panel A and the distribution of 117 FPIs by their home country as defined by *LOC* variable in Compustat, accompanied by their mean market capitalization in millions of U.S. Dollars.

Panel A: Sample Selection Procedure

Sample	**FPIs**	
	Change	**Firms**
All CRSP/Compustat Merged Industrial Annual Database with fiscal year-ends between January 2002 to December 2007		2586
Nonfinancial companies (SIC>=6000 & SIC<7000)	(296)	2290
Market capitalisation higher than $700 million for fiscal year ending on or after 15th July, 2005, the year before SOX implementation rule	(1848)	442
Verify firm names with SEC list to verify FPI status		316
Verify ADR listing status from Bank of New York Mellon database	(0)	316
Data for earnings attributes and controls from Compustat and CRSP	(0)	316
Quarterly CDS data	(199)	117

Panel B: Distribution by Country

Home country of FPI	**# of Firms**	**Market Capitalization ($ millions)**
Australia	3	33,182.370
Austria	1	10,759.800
Belgium	1	6,200.340
Brazil	1	47,373.500
Canada	26	14,104.620
Finland	4	25,284.570
France	11	36,480.210
Germany	6	42,048.500
Greece	1	10,273.500
Hong Kong	3	35,407.210
India	1	7978.260
Ireland	1	5973.950
Israel	1	26,606.000
Italy	2	52,323.750
Japan	9	57,698.870
Mexico	2	40,115.700
Netherlands	6	23,199.570
Norway	2	21,246.200
Portugal	1	11,234.500
Singapore	1	1,915.200
South Africa	1	13,069.400
South Korea	5	15,728.250
Spain	4	45,135.130
Sweden	2	36,809.100
Switzerland	5	36,958.680
United Kingdom	17	51,842.800
Countries: 26	117	708,949.980

TABLE 2

DESCRIPTIVE STATISTICS ON FIRM CHARACTERISTICS

This table presents the descriptive statistics on firm characteristics. Panel A presents the mean and median values of the characteristics in pre- (2005) and post- (2006) SOX compliance fiscal years for FPIs. Panel B presents the mean and median values of the characteristics in pre- (2003) post- (2004) SOX compliance fiscal years for domestic U.S. firms. Differences in mean (median) values are tested across the pre- and post-SOX periods, using a t-test for the means and the Wilcoxon Signed Rank test for medians. CDS represents CDS spreads quoted in basis points divided by 100. All other variables are as defined in Appendix Table A.I. *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Panel A: FPIs

Variables	Pre-SOX		Post-SOX		Post Minus Pre SOX Difference	
	Mean	Median	Mean	Median	T-test	Wilcoxon Signed-Rank Test
CDS	0.639	0.350	0.547	0.340	-1.963**	-2.283**
Firm Size	4.328	4.335	4.387	4.381	7.701***	7.929***
Cash flow variability	0.111	0.080	0.102	0.789	-2.118**	-3.219***
Sales variability	0.183	0.135	0.171	0.129	-2.482**	-2.473**
Operating cycle	2.027	2.028	2.019	2.026	-1.023	-1.053
Negative earnings	0.145	0.100	0.141	0.100	-0.120	-0.733
Intangibles intensity	0.031	0.004	0.031	0.004	0.043	2.237**
Absence of intangibles	0.350	-	0.360	-	0.000	-
Capital intensity	0.407	0.400	0.396	0.398	-2.955***	-2.201**
MV	9.671	9.593	9.813	9.722	4.754***	4.573***
Leverage	0.151	0.140	0.146	0.132	-1.308	-2.193**
Rating	2.201	2.197	2.244	2.303	2.112**	1.728*
SdRet	-4.199	-4.280	-4.096	-4.155	6.986***	6.030***
ROA	0.055	0.050	0.060	0.052	1.192	-2.464**
Spot (%)	3.150	3.150	4.730	4.730	-	10.817***

TABLE 2

DESCRIPTIVE STATISTICS ON FIRM CHARACTERISTICS (Continued)

Panel B: Domestic U.S. firms

Variables	Pre-SOX		Post-SOX		Post Minus Pre SOX Difference	
	Mean	Median	Mean	Median	T-test	Wilcoxon Signed-Rank Test
CDS	0.686	0.425	0.633	0.400	-1.666*	-2.015**
Firm Size	4.111	4.153	4.143	4.173	6.737***	6.292***
Cash flow variability	0.048	0.041	0.046	0.037	-1.705*	-2.381**
Sales variability	0.189	0.147	0.187	0.142	-0.567	-1.552
Operating cycle	2.015	2.046	2.017	2.051	0.393	0.521
Negative earnings	0.097	0.000	0.095	0.000	-0.513	-0.297
Intangibles intensity	0.051	0.023	0.048	0.024	-0.876	-0.535
Absence of intangibles	0.299	-	0.282	-	-1.420	-
Capital intensity	0.354	0.309	0.340	0.300	-3.556***	-4.029***
MV	9.243	9.155	9.482	9.301	10.624***	8.237***
Leverage	0.163	0.141	0.145	0.120	-5.472***	-5.716***
Rating	2.303	10.000	2.303	10.000	1.734*	1.916*
SdRet	-4.046	0.018	-4.289	0.014	-10.646***	-7.697***
ROA	0.054	0.048	0.066	0.056	3.215***	3.733***
Spot (%)	1.010	1.010	1.370	1.370	-	10.817***

TABLE 3
REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES

This table presents the panel data results for the association between CDS spreads and earnings attributes as proxies of information risk results across the pre- and post-SOX fiscal years. Panel A presents the results for FPIs across the pre- (2005) and post (2006) -SOX compliance years and Panel B presents the results for domestic U.S. firms across the pre- (2003) and post (2004) -SOX compliance years. The dependent variable is CDS spreads divided by 100. Columns 1 through 7 consider one earnings attribute at a time along with the control variables, namely, *MV*, *Leverage*, *Rating*, *SdRet*, *ROA,* and *Spot*. These control variables are determinants of CDS spreads and are defined in Appendix Table A.I. Column 8 pools all seven earnings attributes into one regression along with the control variables. The table presents coefficients from estimation and t-statistics in parentheses. The earnings attributes are as defined in Francis et al. (2004). *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Panel A: FPIs

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	13.606***							14.808***
	(4.470)							(4.040)
Persistence		0.005						-0.044
		(0.040)						(-0.350)
Predictability			0.093					-0.002
			(1.580)					(-0.030)
Smoothness				0.532***				0.334**
				(3.820)				(2.100)
Relevance					0.310***			0.341***
					(2.660)			(2.670)
Timeliness						-0.070		-0.033
						(-0.650)		(-0.300)
Conservatism							0.007*	0.007*
							(1.860)	(1.650)
MV	-0.094	-0.049	-0.072	-0.098*	-0.078	-0.051	-0.055	-0.159**
	(-1.630)	(-0.800)	(-1.170)	(-1.650)	(-1.240)	(-0.770)	(-0.870)	(-2.380)
Leverage	1.531**	1.426**	1.437**	1.681***	1.616**	1.787**	1.731***	1.949***
	(2.570)	(2.260)	(2.290)	(2.770)	(2.380)	(2.560)	(2.610)	(2.990)
Rating	0.391*	0.660***	0.622***	0.395*	0.559**	0.613***	0.602***	0.065
	(1.860)	(3.100)	(2.910)	(1.830)	(2.560)	(2.720)	(2.760)	(0.290)
SdRet	0.830***	0.886***	0.817***	0.801***	0.967***	0.955***	1.027***	0.904***
	(4.670)	(4.640)	(4.300)	(4.420)	(4.990)	(4.820)	(5.150)	(4.620)
ROA	-2.270***	-2.079**	-1.802**	-2.321***	-2.290**	-2.064**	-1.940**	-2.855***
	(-2.620)	(-2.210)	(-1.960)	(-2.640)	(-2.370)	(-2.140)	(-2.050)	(-3.010)
Spot	0.065	0.082	0.081	0.084	0.105*	0.099	0.094	0.072
	(1.140)	(1.370)	(1.350)	(1.470)	(1.700)	(1.570)	(1.490)	(1.200)
Intercept	3.984	3.513	3.372	3.824	4.427	3.948	4.278	5.367
Adj R^2	0.493	0.435	0.445	0.478	0.465	0.449	0.458	0.557
N	183	183	182	183	171	171	170	161

TABLE 3

REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES (Continued)

Panel B: Domestic U.S. firms

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	2.820							0.878
	(1.640)							(1.280)
Persistence		-0.036						-0.103
		(-0.360)						(-0.960)
Predictability			0.033					0.007
			(0.970)					(0.170)
Smoothness				0.312***				0.301**
				(2.850)				(2.290)
Relevance					0.209***			0.136**
					(2.710)			(1.980)
Timeliness						0.147		0.068
						(1.300)		(0.540)
Conservatism							-0.000	-0.000
							(-0.140)	(-0.100)
MV	-0.066	-0.063	-0.068*	-0.074*	-0.060	-0.056	-0.067	-0.058
	(-1.600)	(-1.490)	(-1.670)	(-1.840)	(-1.470)	(-1.360)	(-1.640)	(-1.360)
Leverage	3.061***	3.003***	2.927***	3.248***	3.060***	2.971***	2.999***	3.368***
	(6.700)	(6.760)	(6.540)	(7.270)	(6.850)	(6.670)	(6.710)	(6.800)
Rating	0.406**	0.423***	0.429***	0.384**	0.402**	0.425***	0.433***	0.350**
	(2.430)	(2.580)	(2.630)	(2.380)	(2.450)	(2.590)	(2.640)	(2.040)
SdRet	1.126***	1.133***	1.116***	1.107***	1.139***	1.141***	1.143***	1.059***
	(8.620)	(8.690)	(8.560)	(8.770)	(8.940)	(8.930)	(8.890)	(7.590)
ROA	-0.594	-0.587	-0.575	-0.848	-0.732	-0.502	-0.561	-0.735
	(-0.710)	(-0.700)	(-0.690)	(-1.020)	(-0.870)	(-0.590)	(-0.660)	(-0.840)
Spot	0.618***	0.619***	0.601***	0.604***	0.622***	0.604***	0.621***	0.548**
	(2.830)	(2.830)	(2.740)	(2.820)	(2.860)	(2.760)	(2.810)	(2.430)
Intercept	2.629	2.678	2.543	2.338	2.792	2.801	2.665	2.366
Adj R^2	0.552	0.551	0.553	0.565	0.556	0.555	0.552	0.558
N	230	230	230	230	229	228	228	226

TABLE 4

CROSS-SECTIONAL REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES PRE-SOX

This table presents the cross-sectional results for the association between CDS spreads and earnings attributes as proxies of information risk in the pre-SOX fiscal year. Panel A presents the results for FPIs in 2005, the pre-SOX compliance year and Panel B presents the results for domestic U.S. firms in 2003, the pre-SOX compliance year for U.S. firms. The dependent variable is CDS spreads divided by 100. Columns 1 through 7 consider one earnings attribute at a time along with the control variables, namely, *MV*, *Leverage*, *Rating*, *SdRet*, and *ROA*. These control variables are determinants of CDS spreads and are defined in Appendix Table A.I. Column 8 pools all seven earnings attributes into one regression along with the control variables. The table presents coefficients from estimation and t-statistics in parentheses. The earnings attributes are as defined in Francis et al. (2004). *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Panel A: FPIs

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	11.305***							10.592***
	(2.710)							(2.650)
Persistence		0.087						-0.001
		(0.580)						(-0.000)
Predictability			0.113					0.039
			(1.500)					(0.460)
Smoothness				0.443**				0.127
				(2.050)				(0.480)
Relevance					0.434**			0.414**
					(2.420)			(2.430)
Timeliness						-0.084		-0.029
						(-0.530)		(-0.170)
Conservatism							0.012***	0.003***
							(2.700)	(2.610)
MV	-0.097	-0.027	-0.070	-0.083	-0.066	-0.049	-0.072	-0.125
	(-1.110)	(-0.290)	(-0.770)	(-0.920)	(-0.710)	(-0.480)	(-0.700)	(-1.170)
Leverage	1.696**	1.836**	1.686*	1.986**	2.183**	2.166**	2.170**	2.258**
	(1.980)	(2.010)	(1.860)	(2.230)	(2.260)	(2.130)	(2.200)	(2.290)
Rating	0.444	0.741**	0.695**	0.546*	0.588**	0.649**	0.572*	0.157
	(1.510)	(2.520)	(2.350)	(1.790)	(1.970)	(2.050)	(1.770)	(0.470)
SdRet	1.022***	1.138***	1.032***	1.021***	1.319***	1.210***	1.306***	1.108***
	(3.990)	(4.130)	(3.800)	(3.830)	(4.740)	(4.210)	(4.360)	(3.590)
ROA	-1.498	-0.729	-0.710	-0.944	-0.992	-0.809	-0.652	-2.298
	(-1.170)	(-0.540)	(-0.530)	(-0.720)	(-0.710)	(-0.570)	(-0.480)	(-1.550)
Intercept	4.417	3.817	3.727	3.953	5.238	4.484	5.253	5.451
Adj R^2	0.484	0.426	0.438	0.449	0.486	0.441	0.448	0.534
N	99	99	98	99	91	92	91	86

TABLE 4

CROSS-SECTIONAL REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES PRE-SOX (Continued)

Panel B: Domestic U.S. firms

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	1.861							1.880*
	(1.540)							(1.650)
Persistence		0.166						0.113
		(0.980)						(0.620)
Predictability			0.059					0.017
			(1.090)					(0.270)
Smoothness				0.410***				0.351**
				(2.580)				(2.170)
Relevance					0.268***			0.229**
					(2.970)			(2.540)
Timeliness						0.097		-0.024
						(0.550)		(-0.120)
Conservatism							0.004	0.005*
							(0.770)	(1.710)
MV	-0.035	-0.049	-0.038	-0.046	-0.027	-0.027	-0.033	-0.045
	(-0.530)	(-0.730)	(-0.570)	(-0.710)	(-0.410)	(-0.400)	(-0.490)	(-0.650)
Leverage	3.381***	3.256***	3.192***	3.691***	3.387***	3.272***	3.363***	3.649***
	(4.800)	(4.820)	(4.690)	(5.410)	(4.960)	(4.820)	(4.930)	(4.690)
Rating	0.279	0.323	0.295	0.246	0.280	0.298	0.291	0.260
	(1.100)	(1.320)	(1.200)	(1.020)	(1.140)	(1.200)	(1.170)	(1.000)
SdRet	1.300***	1.392***	1.284***	1.289***	1.298***	1.317***	1.322***	1.336***
	(6.520)	(6.620)	(6.530)	(6.730)	(6.610)	(6.710)	(6.670)	(5.830)
ROA	-0.193	-0.075	-0.172	-0.283	-0.403	-0.182	-0.059	-0.178
	(-0.150)	(-0.060)	(-0.140)	(-0.230)	(-0.320)	(-0.140)	(-0.050)	(-0.130)
Intercept	4.445	4.684	4.315	4.082	4.574	4.610	4.561	4.353
Adj R^2	0.540	0.544	0.545	0.561	0.547	0.542	0.542	0.544
N	116	116	116	116	115	115	114	113

TABLE 5

CROSS-SECTIONAL REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES POST-SOX

This table presents the cross-sectional results for the association between CDS spreads and earnings attributes as proxies of information risk in the post-SOX fiscal year. Panel A presents the results for FPIs in 2006, the post-SOX compliance year and Panel B presents the results for domestic U.S. firms in 2004, the post-SOX compliance year for U.S. firms. The dependent variable is CDS spreads divided by 100. Columns 1 through 7 consider one earnings attribute at a time along with the control variables, namely, *MV*, *Leverage*, *Rating*, *SdRet*, and *ROA*. These control variables are determinants of CDS spreads and are defined in Appendix Table A.I. Column 8 pools all seven earnings attributes into one regression along with the control variables. The table presents coefficients from estimation and t-statistics in parentheses. The earnings attributes are as defined in Francis et al. (2004). The table presents coefficients from estimation and t-statistics in parentheses. *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Panel A: FPIs

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	14.250***							11.001***
	(3.290)							(2.600)
Persistence		-0.238						-0.191
		(-1.400)						(-1.090)
Predictability			0.052					-0.053
			(0.730)					(-0.730)
Smoothness				0.659***				0.674***
				(3.940)				(3.460)
Relevance					0.136			0.151
					(0.810)			(0.720)
Timeliness						-0.026		-0.063
						(-0.180)		(-0.390)
Conservatism							0.006**	0.012**
							(2.440)	(1.960)
MV	-0.075	-0.060	-0.053	-0.096	-0.062	-0.035	-0.031	-0.144*
	(-0.990)	(-0.770)	(-0.670)	(-1.330)	(-0.740)	(-0.410)	(-0.390)	(-1.750)
Leverage	1.433*	1.163	1.244	1.545*	1.192	1.398	1.218	1.504*
	(1.710)	(1.360)	(1.430)	(1.940)	(1.270)	(1.470)	(1.390)	(1.780)
Rating	0.297	0.452	0.477	0.103	0.470	0.517	0.520	-0.052
	(0.960)	(1.460)	(1.520)	(0.340)	(1.460)	(1.610)	(1.640)	(-0.170)
SdRet	0.631**	0.623**	0.618**	0.606**	0.650**	0.690**	0.770***	0.617**
	(2.540)	(2.420)	(2.320)	(2.560)	(2.450)	(2.550)	(2.890)	(2.400)
ROA	-3.395***	-4.462***	-3.408***	-4.235***	-3.918***	-3.757***	-3.748***	-4.819***
	(-2.860)	(-3.350)	(-2.640)	(-3.740)	(-3.010)	(-2.890)	(-2.880)	(-3.720)
Intercept	3.015	2.720	2.518	3.319	2.844	2.623	2.926	4.024
Adj R^2	0.503	0.472	0.463	0.550	0.463	0.467	0.479	0.604
N	84	84	84	84	80	79	79	75

TABLE 5

CROSS-SECTIONAL REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES POST-SOX (Continued)

Panel B: Domestic U.S. firms

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	5.149*							6.854**
	(1.690)							(2.040)
Persistence		-0.173						-0.222
		(-1.400)						(-0.670)
Predictability			0.018					0.003
			(0.430)					(0.070)
Smoothness				0.229***				0.231**
				(2.750)				(2.390)
Relevance					0.125*			0.051*
					(1.900)			(1.680)
Timeliness						0.206		0.141
						(1.400)		(0.870)
Conservatism							-0.000	-0.000
							(-0.360)	(-0.340)
MV	-0.095*	-0.077	-0.098**	-0.102**	-0.094*	-0.082	-0.097*	-0.068
	(-1.910)	(-1.500)	(-1.970)	(-2.060)	(-1.880)	(-1.630)	(-1.950)	(-1.280)
Leverage	2.644***	2.645***	2.539***	2.711***	2.619***	2.557***	2.552***	2.902***
	(4.450)	(4.550)	(4.310)	(4.640)	(4.460)	(4.360)	(4.350)	(4.530)
Rating	0.578***	0.560***	0.608***	0.566***	0.581***	0.583***	0.597***	0.454**
	(2.610)	(2.580)	(2.810)	(2.630)	(2.650)	(2.690)	(2.750)	(1.960)
SdRet	0.914***	0.922***	0.915***	0.904***	0.940***	0.930***	0.942***	0.859***
	(5.290)	(5.510)	(5.190)	(5.380)	(5.590)	(5.540)	(5.580)	(4.740)
ROA	-0.776	-0.558	-0.727	-1.122	-0.833	-0.627	-0.817	-0.802
	(-0.680)	(-0.490)	(-0.630)	(-0.970)	(-0.720)	(-0.540)	(-0.710)	(-0.660)
Intercept	1.975	2.193	1.910	1.784	2.144	2.199	2.086	2.004
Adj R^2	0.560	0.566	0.559	0.568	0.560	0.565	0.559	0.560
N	114	114	114	114	114	113	114	113

TABLE 6

DIFFERENCE-IN-DIFFERENCE ANALYSIS

This table presents the results for the difference-in-difference analysis. These results are obtained upon estimating equation (4) discussed in the Research Design section.FPI represents a dummy that takes the value 1 for FPIs and 0 for domestic U.S. firms whereas Post represents a dummy that takes the value 1 for post-SOX compliance year and 0 for pre-SOX compliance year. The pre- and post-SOX compliance years are 2005 (3003) and 2006 (2004) for FPIs (U.S. firms) respectively. The dependent variable is CDS spreads divided by 100. Each column considers one earnings attribute at a time along with the control variables, namely, *MV*, *Leverage*, *Rating*, *SdRet*, and *ROA*. These control variables are determinants of CDS spreads and are defined in Appendix Table A.I. The earnings attributes are as defined in Francis et al. (2004). The table presents coefficients from estimation and t-statistics in parentheses. *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

	AccrualQuality	Persistence	Predictability	Smoothness	Relevance	Timeliness	Conservatism
FPI	-0.171	0.119	0.008	-0.015	0.107	0.121	0.117
	(-1.310)	(1.180)	(0.060)	(-0.080)	(1.260)	(1.410)	(1.370)
Post	0.208	0.138	0.286**	0.312*	0.216***	0.217***	0.224***
	(1.590)	(1.400)	(2.430)	(1.710)	(2.590)	(2.610)	(2.700)
EA (Earnings Attribute)	1.031	0.087	0.064	0.358**	0.269	0.105	0.003
	(0.240)	(0.580)	(1.280)	(2.140)	(1.250)	(0.640)	(0.620)
EA × FPI × Post	5.010*	0.167	0.006	0.115**	-0.269	-0.019	0.004
	(1.910)	(0.580)	(0.780)	(2.340)	(-0.710)	(-0.060)	(0.410)
EA × FPI	13.918**	0.034	0.053	0.166	0.153	-0.186	0.003
	(2.450)	(0.180)	(0.670)	(0.700)	(0.600)	(-0.900)	(0.260)
EA × Post	0.358*	-0.268	-0.067	-0.148	-0.107	0.116	-0.004
	(1.640)	(-1.310)	(-0.980)	(-0.630)	(-0.340)	(0.480)	(-0.650)
FPI × Post	0.251	-0.326	-0.341	-0.451	0.387***	0.385***	0.382***
	(1.310)	(-1.160)	(-1.220)	(-1.090)	(3.130)	(3.090)	(3.070)
MV	-0.002	-0.012	- 0.007	-0.001	-0.003	-0.009	-0.012
	(-0.070)	(-0.330)	(-0.210)	(-0.030)	(-0.100)	(-0.250)	(-0.350)
Leverage	2.323***	2.282***	2.213***	2.499***	2.416***	2.414***	2.392***
	(6.410)	(6.210)	(5.990)	(6.880)	(6.390)	(6.330)	(6.390)
Rating	0.411***	0.520***	0.521***	0.405***	0.480***	0.508***	0.511***
	(3.130)	(3.970)	(4.000)	(3.110)	(3.640)	(3.790)	(3.840)
SdRet	1.017***	1.060***	1.010***	0.998***	1.081***	1.070***	1.099***
	(9.640)	(9.640)	(9.300)	(9.550)	(10.030)	(9.820)	(9.970)
ROA	-1.684***	-1.340**	-1.374**	-1.740***	-1.586**	-1.362**	-1.293**
	(-2.810)	(-2.130)	(-2.250)	(-2.900)	(-2.530)	(-2.150)	(-2.070)
Intercept	3.620	3.457	3.204	3.274	3.694	3.518	3.584
Adj R^2	0.516	0.494	0.497	0.516	0.509	0.502	0.503
N	413	413	412	413	400	399	398

TABLE 7

REGRESSION OF CDS SPREADS ON ANALYST COVERAGE PROXY FOR INFORMATION RISK

This table presents the pooled panel data results for the regression of CDS spreads on Analyst Coverage variable. The Analyst Coverage variable for a firm-year refers to the number of analysts covered on I/B/E/S that report annual earnings forecasts for the firm in its fiscal year-end month. The pooled data spans across the pre- and post-SOX compliance. The pre- and post-SOX compliance years are 2005 (3003) and 2006 (2004) for FPIs (U.S. firms) respectively. The two columns in the table present the results for FPIs and U.S. firms. The dependent variable is CDS spreads divided by 100. The control variables, namely, *MV*, *Leverage*, *Rating*, *SdRet*, and *ROA* are determinants of CDS spreads and are defined in Appendix Table A.I. The table presents coefficients from estimation and t-statistics in parentheses. *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Pooled Sample		
	FPIs	Domestic U.S. firms
Analyst Coverage	-0.021***	-0.023***
	(-3.230)	(-2.620)
MV	-0.145**	-0.164***
	(-2.010)	(-3.360)
Leverage	2.496***	2.988***
	(3.290)	(6.530)
Rating	0.434*	0.497***
	(1.790)	(3.030)
SdRet	0.531**	1.255***
	(2.360)	(9.690)
ROA	-0.633	-0.546
	(-0.590)	(-0.650)
Spot	0.083	0.555**
	(1.160)	(2.520)
Intercept	4.370	2.546
Adj R^2	0.464	0.589
N	183	219

TABLE 8

REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES: EXCLUDING FIRMS FROM IFRS ADOPTING COUNTRIES

This table presents the results for the association between CDS spreads and earnings attributes as proxies of information risk after excluding FPIs where the home countries adopted IFRS in the fiscal year 2005. The sample thus includes 45 firms across Brazil, Canada, India, Israel, Japan, Mexico, and South Korea. Panel A, Panel B, and Panel C present the results for FPIs for the panel data, the results for pre- (2005) SOX fiscal year, and those for the post- (2006) SOX fiscal years respectively. The dependent variable is CDS spreads divided by 100. Columns 1 through 7 consider one earnings attribute at a time along with the control variables, namely, *MV*, *Leverage, Rating*, *SdRet*, and *ROA*. These control variables are determinants of CDS spreads and are defined in Appendix Table A.I. Column 8 pools all seven earnings attributes into one regression along with the control variables. The table presents coefficients from estimation and t-statistics in parentheses. The earnings attributes are as defined in Francis et al. (2004). *, **, and *** denote significance at 10 %, 5%, and 1% levels, respectively.

Panel A: Panel Regression

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	23.092**							22.492**
	(2.540)							(1.960)
Persistence		-0.089						0.087
		(-0.460)						(0.430)
Predictability			-0.023					0.228**
			(-0.300)					(2.470)
Smoothness				0.846**				1.031***
				(2.470)				(2.630)
Relevance					0.083			0.127
					(0.360)			(0.580)
Timeliness						0.593**		0.296
						(2.460)		(1.110)
Conservatism							0.007*	0.004**
							(1.940)	(2.310)
MV	-0.064	-0.155	-0.149	-0.164	-0.163	-0.158	-0.179	-0.041
	(-0.530)	(-1.120)	(-1.080)	(-1.300)	(-1.230)	(-1.200)	(-1.340)	(-0.300)
Leverage	2.732**	2.178	2.158	3.137**	2.551*	2.886*	2.730*	4.546***
	(1.990)	(1.470)	(1.480)	(2.450)	(1.720)	(1.890)	(1.810)	(3.060)
Rating	0.881	1.022	1.011	0.750	0.851	1.016	0.844	0.427
	(1.230)	(1.320)	(1.180)	(0.960)	(0.960)	(1.160)	(0.910)	(0.560)
SdRet	0.221	0.395	0.451	0.324	0.610	0.614	0.677	0.595
	(0.580)	(1.100)	(1.160)	(0.950)	(1.350)	(1.440)	(1.490)	(1.380)
ROA	-3.450**	-4.405**	-4.293**	-3.460**	-4.317**	-3.566**	-3.811**	-2.850
	(-2.280)	(-2.230)	(-2.200)	(-2.090)	(-2.370)	(-2.010)	(-2.110)	(-1.610)
Spot	0.021	0.016	0.023	0.060	0.052	0.008	0.042	0.044
	(0.220)	(0.160)	(0.220)	(0.610)	(0.460)	(0.080)	(0.400)	(0.430)
Intercept	-0.344	1.402	1.682	1.212	2.849	2.143	3.216	1.399
Adj R^2	0.606	0.515	0.514	0.572	0.524	0.568	0.546	0.691
N	69	69	68	69	67	66	64	63

TABLE 8

REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES: EXCLUDING FIRMS FROM IFRS ADOPTING COUNTRIES (Continued)

Panel B: Pre-SOX

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	19.126**							22.551**
	(2.100)							(2.000)
Persistence		-0.039						0.199
		(-0.140)						(0.710)
Predictability			-0.082					-0.215
			(-0.910)					(-1.610)
Smoothness				0.468				0.602
				(1.220)				(1.030)
Relevance					0.265			0.206
					(1.140)			(1.070)
Timeliness						0.462		0.245
						(1.480)		(0.700)
Conservatism							0.012**	0.015**
							(1.970)	(2.400)
MV	-0.124	-0.215	-0.203	-0.212	-0.204	-0.242	-0.247	-0.066
	(-0.800)	(-1.180)	(-1.120)	(-1.220)	(-1.180)	(-1.320)	(-1.250)	(-0.300)
Leverage	2.001	1.423	1.289	2.066	1.967	2.265	2.108	3.965*
	(1.040)	(0.700)	(0.650)	(1.030)	(0.900)	(1.000)	(0.910)	(1.740)
Rating	0.675	0.714	0.738	0.597	0.529	0.682	0.629	0.312
	(1.180)	(1.180)	(1.160)	(0.930)	(0.890)	(1.070)	(0.970)	(0.510)
SdRet	0.111	0.187	0.239	0.201	0.550	0.368	0.225	0.669
	(0.240)	(0.420)	(0.520)	(0.460)	(0.930)	(0.720)	(0.450)	(1.100)
ROA	-5.583***	-6.146**	-6.294***	-5.144**	-6.117***	-5.425**	-6.143***	-4.071**
	(-2.780)	(-2.500)	(-2.670)	(-2.240)	(-2.880)	(-2.500)	(-2.650)	(-2.210)
Intercept	0.456	1.976	2.179	1.813	3.730	2.899	2.593	2.530
Adj R^2	0.617	0.544	0.550	0.561	0.568	0.580	0.574	0.716
N	39	39	38	39	37	37	35	35

TABLE 8

REGRESSION OF CDS SPREADS ON EARNINGS ATTRIBUTES: EXCLUDING FIRMS FROM IFRS ADOPTING COUNTRIES (Continued)

Panel C: Post-SOX

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
AccrualQuality	32.119***							22.294**
	(3.220)							(2.460)
Persistence		-0.142						0.016
		(-0.580)						(0.040)
Predictability			0.050					0.218*
			(0.420)					(1.940)
Smoothness				1.319**				1.340***
				(2.480)				(2.760)
Relevance					-0.746			-0.229
					(-1.400)			(-0.440)
Timeliness						0.772		0.260
						(1.440)		(0.720)
Conservatism							0.009*	0.013*
							(1.710)	(1.650)
MV	-0.036	-0.124	-0.123	-0.125	-0.045	-0.069	-0.137	-0.001
	(-0.170)	(-0.530)	(-0.560)	(-0.760)	(-0.200)	(-0.330)	(-0.690)	(-0.000)
Leverage	2.884	1.960	1.919	3.342	2.219	2.106	2.140	4.373**
	(1.090)	(0.710)	(0.700)	(1.560)	(0.890)	(0.860)	(0.900)	(2.030)
Rating	1.420	2.001	2.020	1.390	2.348	2.160	1.936	1.062
	(0.970)	(1.130)	(1.150)	(1.240)	(1.490)	(1.540)	(0.990)	(0.950)
SdRet	-0.036	0.320	0.294	0.116	0.253	0.514	0.618	0.263
	(-0.050)	(0.460)	(0.380)	(0.210)	(0.380)	(0.740)	(0.730)	(0.360)
ROA	-0.704	-2.425	-1.973	-2.352	-0.563	-1.722	-1.666	-1.198
	(-0.490)	(-1.070)	(-0.920)	(-1.390)	(-0.280)	(-0.730)	(-0.770)	(-0.580)
Intercept	-3.354	1.670	1.877	2.238	3.509	1.705	0.205	-2.316
Adj R^2	0.727	0.645	0.644	0.738	0.673	0.713	0.687	0.843
N	30	30	30	30	30	29	29	28

APPENDIX TABLE A.I

VARIABLE DESCRIPTION AND DATA SOURCES

This table describes the definitions and computations of the firm characteristics used in preliminary analysis and control variables used in the panel and cross-sectional regressions of CDS spreads on earning attributes as proxies for information risk.

Variable	Description	Source
Innate Determinants of Earnings Attributes		
Firm Size	Log of total assets	Compustat
Cash flow variability	Standard deviation of firm's rolling ten-year cash flows from operations, scaled by total assets	Compustat
Sales variability	Standard deviation of firm's rolling ten-year sales revenues, scaled by total assets	Compustat
Operating cycle	Log of sum of firm's days accounts receivable and days inventory	Compustat
Negative earnings	Firm's proportion of losses over the prior ten years	Compustat
Intangibles intensity	Sum of firm's reported R&D and advertising expenses as a proportion of its sales revenues, missing values of R&D and advertising expense set to zero	Compustat
Absence of intangibles	Indicator dummy equal to 1 if Intangibles intensity variable equals 0, and 0 otherwise	-
Capital intensity	Ratio of net book value of property, plant, and equipment to total assets	Compustat
Control Variables		
MV	Natural logarithm of previous year's market value measured as fiscal year end price multiplied by number of shares outstanding on the last day of fiscal year end	Compustat
Leverage	Firm's long-term debt scaled by value of assets (market value of equity plus book value of total liabilities)	Compustat
Rating	Natural logarithm of S&P short-term credit rating	Compustat
SdRet	Natural logarithm of stock return volatility measured as standard deviation of daily returns during the firm's current fiscal year	CRSP
ROA	Net income before extraordinary items for the fiscal year divided by total assets	Compustat
Spot	Risk-free interest measured as three-month annualized T-bill rates	Federal Reserve Bank of St. Louis-H15 Release