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Initial Technical Violations of Debt Covenants and Changes in Firm Risk

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1. INTRODUCTION

Recent research regarding debt covenant violation has emphasized the economic consequences of technical default and the information conveyed to the capital markets by announcements of technical default. Studies have shown, for example, that firms manipulate accruals in an effort to postpone technical violations (e.g., Defond and Jiambalvo, 1994; and Sweeney, 1994), that the costs of technical violation can be substantial (Beneish and Press, 1993), and that common share prices respond negatively when violations are disclosed (Beneish and Press, 1995a). These studies reveal that technical debt covenant violations are significant, often recurring, economic events that are considered important by managers and value-relevant by common stock investors. We add to this research by investigating the changes in firm risk that are associated with initial technical debt covenant violations.[1]

Technical violations of debt covenants arise when firms fail to meet the contractual requirements contained in debt agreements. When technical default occurs, lenders often waive the

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requirements in the expectation that the violation will be remedied in the short-term. However, even if waivers are obtained the concessions demanded by lenders often are substantial, suggesting that lenders view breaches of financing agreements as significant (Beneish and Press, 1993). In the most extreme cases, lenders may require accelerated repayment of the violated debt. Because technical violations point to potentially significant breaches in firms' financing agreements and, *ceteris paribus*, increase the likelihood of debt service default and bankruptcy (Beneish and Press, 1995b; and Wilkins, 1997) we contend that violations are likely to signal impending changes in firm risk.[2]

To test this proposition, we examine the changes in systematic and unsystematic risk that occur when firms first violate technical covenants in their debt contracts. We exclude firms experiencing debt service default because such events reflect relatively more significant underlying economic problems and are likely to have direct, immediate cash flow implications for the defaulting firm. In essence, our purpose is to test whether initial technical violations are both significant enough and timely enough to allow users to make predictions about future levels of equity risk prior to observing more significant events such as debt service default or bankruptcy.[3]

Our results indicate that initial debt covenant violations are associated with significant increases in both systematic and unsystematic risk. The increase in systematic risk is attributable primarily to rising levels of financial leverage as opposed to changes in the underlying asset beta. We also show that the change in unsystematic risk associated with technical default is a significant predictor of future exchange delisting, even after controlling for other factors typically associated with increasing financial distress. Moreover, the change in unsystematic risk is the only significant predictor of delisting for companies that are dropped from their exchanges three years or more after the initial violation occurs.

Our findings should be of interest to a number of parties as they evaluate their relationships with firms that are in danger of violating their debt contracts. Investors would be expected to be concerned with the shift in systematic risk since portfolio theory suggests that only systematic risk is priced in a well-functioning market. However, parties such as employees, debtholders, suppliers, and auditors – who are interested in estimating firm risk as a step within analytical procedures (Bell et al., 1997) – may find the results regarding unsystematic risk and delisting to be equally valuable, given that they may not be capable of fully diversifying away this element of their business relationships.

The remainder of the paper is structured as follows. The next section develops our hypotheses. Section 3 provides the sample selection procedure and presents summary statistics, while Section 4 outlines the empirical method. Sections 5 and 6 present our results and the final section provides concluding remarks.

2. DEVELOPMENT OF HYPOTHESES

While previous theory has posited reasons for the existence of debt covenants, little theoretical guidance has been provided regarding the consequences of debt covenant violation. Previous empirical research finds that most firms that violate their covenants do so more than once and that technical violations are associated with an increased likelihood of future financial distress (e.g., Beneish and Press, 1995b; and Wilkins, 1997). We build on these findings by predicting that technical violations are associated with increases in equity risk which can be used to predict the likelihood of subsequent exchange delisting.

Finance and accounting researchers (e.g., Hamada, 1972; Hertzel and Jain, 1991; and Hertzel and Rees, 1998) traditionally have focused on issues involving systematic risk. The emphasis on systematic risk stems primarily from the fact that it is the only element of total equity risk (i.e., returns variance) that cannot be eliminated through diversification. More specifically, it is the only element of risk that should be priced by investors.[4] As previously mentioned, however, parties other than equity investors have an interest in the risk of the firm. Trade creditors that have business relationships with violating firms are likely to be interested in unsystematic risk, given that these 'firm-specific' effects can significantly affect a firm's ability to satisfy its existing contracts. Furthermore, because most violations occur in illiquid private debt agreements, firms that hold or guarantee the violated debt are unlikely to be able to satisfactorily diversify away their risks. In short, because there are parties to the firm other than common stockholders, our empirical tests investigate changes in the total equity risk – both systematic and unsystematic components – of violating firms.

Our basic proposition is that because technical default indicates an increased likelihood of further financial distress (e.g., Beneish and Press, 1995b; and Wilkins, 1997), covenant violations should be associated with increases in firm risk. Beneish and Press (1995b) argue that technical default is a strong signal of subsequent distress. Specifically, they show that the incidence of missed payments (i.e., debt service default) and bankruptcy is more common after technical default than the unconditional incidences of these events in the general population of firms. Beneish and Press (1995b) also find that Chapter 11 announcement period abnormal returns are less negative if the announcement is preceded by technical default. They interpret this result as being consistent with technical default serving as a timely warning of future financial distress. Our tests involving changes in risk provide a more direct test of how market risk perceptions change around the period of the initial violation.[5] We hypothesize that in a reasonably efficient market, this warning should be manifest in higher levels of risk. More formally, our hypotheses are as follows:

H_1: Initial technical debt covenant violations are associated with significant increases in systematic risk.

H_2: Initial technical debt covenant violations are associated with significant increases in unsystematic risk.

One problem inherent in research of this nature is determining when users first receive information regarding the event of interest. Previous research has shown that firms often experience deteriorating financial condition prior to violating their debt covenants (e.g., Defond and Jiambalvo, 1994). If this is the case and if the deteriorating financial condition is associated with a material increase in risk, then the power of our tests to document an increase in risk subsequent to the violation is reduced. Our work must therefore be viewed as a joint test of the sufficiency of the debt covenant violation as an indicator of the change in risk and the timing of the risk shifts surrounding initial debt covenant violations.

Hypotheses 1 and 2 can be viewed as investigating the short-term risk effects associated with initial debt covenant violations. If the violation is an important signal of long-term financial distress, the changes in systematic and unsystematic risk associated with initial violations should be positively correlated with future delisting. To test this relationship, we examine how many of our sample firms were delisted for financial reasons such as liquidation, bankruptcy, or insufficient capital in periods following the initial covenant violation. We then test whether the changes in risk associated with initial violations can be used to predict firms' future delisting status. We expect that the shifts in systematic and unsystematic risk that are associated with initial technical covenant violations are positively related to long-term financial distress, as indicated by exchange delisting. Accordingly, our last two hypotheses are as follows:

H_3: Changes in systematic risk associated with initial debt covenant violations are positively related to future delisting.

H_4: Changes in unsystematic risk associated with initial debt covenant violations are positively related to future delisting.

3. SAMPLE DESCRIPTION AND SUMMARY STATISTICS

The original sample collected for this study contained 275 firms identified by LEXIS as having debt covenant violations between 1978 and 1995. Thirty-five firms were eliminated because they did not have at least 200 non-missing returns in both of the event years. An additional 58 firms were removed because they did not have complete COMPUSTAT data. Our final sample consists of 182 firms.

For each firm, we examined 10-K or annual report filings in year −1 and year −2 relative to the first violation disclosure as per LEXIS to determine whether other violations had occurred prior to the initially-identified violation year. If violations occurred in year −1 or year −2, we examined prior 10-K or annual report filings until we found two consecutive years where the firm was in full compliance with its covenant requirements. In other words, the event year (the year in which the initial violation occurred) is defined as the first year of debt covenant violation that was preceded by at least two years of compliance.

We define the violation disclosure date as the trading day occurring three months after the fiscal year end in which the first violation occurred. Our results are qualitatively unchanged when we define the violation disclosure date as the S.E.C. stamp date on the 10-K filing. However, because many of the 10-K stamp dates were considerably later than the expected filing date (see Alford et al., 1994 for potential explanations), the results we present are those that define the disclosure date as three months past the violation year-end. As previously mentioned, to the extent that the violations are pre-empted by specific news announcements or poor earnings results (e.g., Core and Schrand, 1997) our tests could fail to find a significant risk shift around the disclosure date even if such a shift does exist.

Summary statistics for the sample firms are presented in Table 1. Consistent with previous research (e.g. Sweeney, 1994; and Defond and Jiambalvo, 1994), there are systematic trends across the event period. Specifically, from year -1 to year $+1$ there are significant decreases in market value of equity, profitability, and liquidity.[6] All of these trends are consistent with violations signaling an increase in firm risk. Altman's (1983) Z-score provides a composite measure of bankruptcy probability. In year -1 the mean sample Z-score is 1.956, but by year $+1$ the Z score has decreased to 1.235. Altman (1983) considers that firms with $Z<1.20$ face a high probability of bankruptcy, so these firms, on average, are at the edge of the 'gray area' that puts them at relatively high risk. The decline in the Z-score indicates a significantly increased probability of bankruptcy associated with first-time technical violations, a finding which is generally consistent with an increase in firm risk.[7]

4. EMPIRICAL METHOD

Our analysis of changes in risk is based on the market model:

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_t. \tag{1}$$

Consistent with Healy and Palepu (1990) and Hertzel and Rees (1998) we omit year 0 in testing for significant changes in risk.

Table 1

Selected Summary Statistics for the Sample of 182 Firms Having Initial Technical Debt Covenant Violations
(Data are presented for year −1 and year +1 relative to the initial technical violation)

	Year −1	*Year +1*	*Difference*
Market Value of Equity ($millions)			
Mean	126.845	92.042	−34.803**
Median	33.356	20.715	−5.623**
Altman's (1983) Z-Score			
Mean	1.956	1.235	−0.721**
Median	1.952	1.413	−0.339**
Return on Assets			
Mean	−0.024	−0.113	−0.089**
Median	0.007	−0.029	−0.030**
Current Assets / Current Liabilities			
Mean	2.081	1.641	−0.440**
Median	1.891	1.386	−0.439**
Sample Firm Annual Raw Returns			
Mean	−0.065	0.047	0.112*
Median	−0.151	−0.118	0.062
Equal Weighted Index Return			
Mean	0.215	0.299	0.084**
Median	0.213	0.272	0.100**

Notes:
**, * indicates that the year +1 measure is significantly different (p<0.05, p<0.10) from the year 0 measure.

T-tests (Wilcoxon sign-rank tests) are used to test whether the mean (median) difference is significantly different from zero.

Market value of equity = fiscal year-end shares * fiscal year-end price from COMPUSTAT.
Return on assets = earnings before extraordinary items / fiscal year-end assets.
Returns are compound returns from days −500 to −251 and +1 to +250.

Specifically, equation (1) is estimated for each firm (j) for the 250-day period ending 251 days prior to the violation disclosure date (year −1) and for the 250-day period beginning one day after the violation disclosure date (year +1). The market return (R_{mt}) is defined as the return on the CRSP equal-weighted index.[8] Our systematic risk tests are based on the changes in mean and median equity betas (β_j) occurring from year −1 to year +1.

Our investigation of unsystematic risk is also based on equation (1). Equation (1) shows that a security's return is a linear function of the return on the market plus a random error. Taking the variance of both sides of equation (1) yields the following expression:

$$\sigma_j^2 = \beta_j^2 \sigma^2(R_m) + \sigma_\varepsilon^2. \quad (2)$$

Equation (2) reveals that the total risk (i.e., variance) associated with a security is determined both by the degree to which its returns covary with market returns (β_j) and by firm-specific disturbances that are independent of market returns (σ_ε^2). Following Healy and Palepu (1990), we use the variance of the residuals (σ_ε^2) from the firm-specific yearly market models to estimate unsystematic risk.

5. RESULTS

Panel A of Table 2 presents the mean and median levels of systematic risk across the event period as well as the changes in systematic risk. Consistent with debt covenant violators being more risky than the average firm, the mean and median betas are consistently above one. Furthermore, consistent with hypothesis 1, the average shift in equity beta associated with an initial debt covenant violation is positive and significant. The mean equity beta increases from 1.168 in the year prior to violation to 1.327 in the year following the violation. The mean change of 0.159 is significant at the one percent level.

Assuming no taxes and only risk-free debt, Hamada (1972) shows that equity beta is a function of financial leverage and the underlying asset beta [$\beta_{asset} = (\beta_{equity}/\text{financial leverage})$]. In Panel A of Table 2 we investigate the changes in these components of equity beta.[9] Consistent with Healy and Palepu (1990), we define financial leverage as the ratio of the total value of the firm to the value of firm equity. Equity value is defined as the market value of common stock plus the book value of preferred stock, and the total value of the firm is defined as equity value plus the book value of long- and short-term debt.

Panel A reveals a significant increase in leverage during the event period (from 2.449 to 2.964).[10] To the extent that higher levels of financial leverage are associated with an increased probability of bankruptcy, this finding is consistent with the trend

Table 2

Results of Tests for Changes in Risk Around Announcements of 182 Initial Technical Debt Covenant Violations

	Year −1	*Year +1*	*Difference*
Panel A: Analysis of Systematic Risk			
β_{equity}			
Mean Estimate	1.168	1.327	0.159**
Median Estimate	1.152	1.323	0.156**
Financial Leverage (VLEV)			
Mean Estimate	2.449	2.964	0.515**
Median Estimate	1.944	1.975	0.203**
β_{asset}			
Mean Estimate	0.668	0.683	0.015
Median Estimate	0.519	0.520	−0.016
Panel B: Analysis of Unsystematic Risk			
Market Model Residual Variance (σ^2)			
Mean Estimate	0.155%	0.323%	0.168%**
Median Estimate	0.098%	0.179%	0.049%**

Notes:
Equity betas are estimated for year −1 and year +1 relative to the initial violation disclosure year. Financial leverage (VLEV) is defined as (book value of debt plus preferred stock plus market value of equity) / (market value of equity). Asset beta (β_{asset}) is the unlevered equity beta [β_{equity}/(VLEV)].

** indicates significance at $p < 0.05$ (two-tailed). *T*-statistics (Wilcoxon Sign-Rank statistics) are used to test whether the mean (median) changes are different from zero.

in Altman's (1983) Z-score, as documented in Table 1. The leverage effect appears particularly dominant in explaining the change in equity beta, given the trends in asset beta. Specifically, the mean asset beta of 0.668 in year −1 is not significantly different from the mean asset beta of 0.683 in year +1. Overall, the results from Panel A of Table 2 are consistent with initial technical debt covenant violations signaling significant increases in systematic risk, due primarily to increasing amounts of financial leverage.

Panel B of Table 2 summarizes the changes in unsystematic risk associated with initial debt covenant violations. The median residual variance increases from 0.098% in the year prior to the violation to 0.179% in the year subsequent to the violation. The median change is significant at the one percent level. The change in mean levels is equally dramatic, with unsystematic risk more than doubling from year −1 to year +1 (0.155% to 0.323%). Furthermore, 75% of the firms displayed higher levels of residual variance in year +1 than in year −1. Therefore, consistent with hypothesis 2, debt covenant violations are associated with significant increases in unsystematic risk.[11]

6. LONG-TERM EFFECTS OF TECHNICAL VIOLATION: SUBSEQUENT DELISTING

Prior research (e.g. Beneish and Press, 1995b; Wilkins, 1997; and Foster et al., 1998) has shown that firms with debt covenant violations tend to suffer further financial distress. As a result, contractual parties are likely to be interested in determining whether violating firms will continue to be economically viable. In this section we consider whether the changes in risk that are associated with initial technical violations can be used to predict stock exchange delisting in future years. Our investigation of delisting status revealed that of the 182 sample firms, 50 (27%) were eventually delisted due to liquidation, bankruptcy, insufficient capital, or other financial reasons (i.e., events having CRSP delisting codes greater than 399). Of these 50 violators, three were delisted within one year of the initial violation, an additional 17 were dropped from one to two years after the initial violation, 11 were delisted between two and three years following the initial violation, and the remaining 19 firms were delisted four years or more from the date of the initial violation.

To investigate the relationship between changes in risk and subsequent delisting, we estimated the following LOGIT model:

$$\begin{aligned}\mathrm{DELIST}_j = {} & \gamma_1 + \gamma_2\mathrm{GC}_j + \gamma_3\mathrm{NOWAIVE}_j + \gamma_4\mathrm{CHGVLEV}_j \\ & + \gamma_5\mathrm{CHGBKPROB}_j + \gamma_6\mathrm{CHGMVE}_j + \gamma_7\mathrm{CHGSYS}_j \\ & + \gamma_8\mathrm{CHGUNSYS}_j + \varepsilon_j. \end{aligned} \tag{3}$$

In equation (3), DELIST is equal to 1 if the firm had been delisted for financial reasons by the end of 1997 and is equal to 0 otherwise. To control for the information content of the auditor's report and lender's waiver decision, we include two dummy variables that are equal to one if the firm received a going concern audit opinion (GC) or failed to receive a default waiver (NOWAIVE), respectively, at the time of the initial technical violation, and are equal to zero otherwise. Given that systematic risk is a positive function of both financial leverage and default risk (Copeland and Weston, 1988), equation (3) also includes the year −1 to year +1 change in VLEV (CHGVLEV) and bankruptcy probability (CHGBKPROB).[12] Finally, we include the change in logged market value of equity (CHGMVE) to control for any significant decreases in equity value that might lead to delisting. CHGSYS and CHGUNSYS are the year −1 to year +1 changes in equity beta and market model residual variance, respectively, as defined in Table 2.[13]

The results of the delisting model are presented in Table 3. Consistent with previous research noting that going concern opinions often precede bankruptcy (e.g., Raghunandan and Rama, 1995; Wilkins, 1997; and Holder-Webb and Wilkins, 1999), GC is positive and significant. Furthermore, both CHGVLEV and CHGBKPROB are significantly positive, indicating that firms with larger increases in leverage and default risk are more likely to face delisting in future periods. Hypothesis 3, which predicts a greater likelihood of delisting for firms with increases in systematic risk, is not supported by the data. That is, after controlling for changes in financial leverage and default risk, the change in equity beta is not an important predictor of future delisting. However, the significant positive relationship between CHGUNSYS and DELIST does support hypothesis 4. Firms with larger increases in unsystematic risk are more likely to be delisted in future periods.

It is also interesting to note that the significance of CHGUNSYS is not determined by the delistings occurring immediately after the initial violation. That is, although it is reasonable to expect that the relationship between the change in unsystematic risk and subsequent delisting would be driven by the delistings occurring relatively close to the time of the initial violation, we do not find this to be the case. In Panel B of Table 3, we re-estimate equation (3) after removing firms that were delisted within two years of the initial violation. In this model, CHGUNSYS is the only variable that continues to be a significant (p-value < 0.08) predictor of future delisting. Therefore, the change in unsystematic risk that is associated with a firm's first debt covenant violation is a significant predictor of severe distress

Table 3

LOGIT Regression Evidence Regarding the Relationship Between Future Delisting and Changes in Risk Associated with Initial Technical Debt Covenant Violations

$$\text{DELIST}_j = \gamma_1 + \gamma_2\text{GC}_j + \gamma_3\text{NOWAIVE}_j + \gamma_4\text{CHGVLEV}_j + \gamma_5\text{CHGBKPROB}_j + \gamma_6\text{CHGMVE}_j + \gamma_7\text{CHGSYS}_j + \gamma_8\text{CHGUNSYS}_j + \varepsilon_j$$

	γ_1	γ_2	γ_3	γ_4	γ_5	γ_6	γ_7	γ_8
Panel A: Complete Sample ($N = 182$)								
Coefficient estimate	−1.94	0.86	−0.22	0.21	0.35	−0.35	−0.16	110.90
p-value	0.01	0.06	0.59	0.02	0.02	0.28	0.45	0.05
Pseudo *R*-Square	0.205							
Panel B: Delistings Within Two Years of Initial Violation Removed ($N = 150$)								
Coefficient estimate	−1.91	0.40	−0.45	0.15	0.10	−0.39	0.20	111.70
p-value	0.01	0.48	0.35	0.21	0.62	0.28	0.45	0.08
Pseudo *R*-Square	0.103							

Notes:
DELIST = 1 for firms with CRSP delisting codes in excess of 399 (e.g. delisting due to liquidation, bankruptcy, insufficient capital, etc.).
DELIST = 0 for all other firms (firms still active or delisted due to mergers or exchanges of stock).
GC = 1 if going concern opinion received, 0 otherwise.
NOWAIVE = 1 if no waiver received, = 0 if waiver received.
CHGVLEV = Year −1 to Year +1 change in VLEV (as defined in Table 2).
CHGBKPROB = Year −1 to Year +1 change in Altman's (1983) Z-score multiplied by −1.
CHGMVE = Year −1 to Year +1 change in logged market value of equity.
CHGSYS = Year −1 to Year +1 change in equity beta.
CHGUNSYS = Year −1 to Year +1 change in unsystematic risk (market model residual variance).

(and, hence, future delisting) even when the delisting occurs three or more years after the initial incident of default. Stated differently, the change in unsystematic risk is a better predictor of severe future financial distress than the audit opinion, changes in equity value, changes in leverage, and changes in default risk.

7. CONCLUDING REMARKS

Technical debt covenant violations involve potentially significant breaches in firms' financing agreements; we argue that such breaches are likely to be associated with significant increases in violating firms' risk. To test this proposition, we investigate the changes in systematic and unsystematic risk associated with first-time technical violations. We also test whether the observed changes in risk have explanatory power incremental to other factors commonly associated with financial distress in estimating the likelihood that firms will be dropped from their exchanges in subsequent periods.

Our results indicate that both systematic risk and unsystematic risk increase around initial debt covenant violations. The increase in systematic risk appears to be due primarily to an increase in financial leverage rather than a change in the underlying asset beta. We also find that increases in unsystematic risk are important predictors of future delisting, even after controlling for changes in leverage, bankruptcy probability, and equity value.

Our results are open to two interpretations. The first is that investors use disclosures regarding technical default in their risk assessments and pricing decisions. A second interpretation is that the risk measures and the violation announcements jointly reflect the same underlying deterioration in the firm's financial condition and that investors are reacting to those events. Whatever the case, our results can be viewed as evidence of the sufficiency of first-time technical debt covenant violations as indicators of material changes in risk. Future research could examine the complex interdependencies that exist between the events that arise before, during, and after incidents of technical default.

NOTES

1 'Debt covenant violation' or 'technical default' refers to the technical violation of an accounting-based debt covenant, such as minimum tangible net worth, minimum profitability, etc. In contrast, 'debt service default' refers to a missed principal or interest payment. Firms that initially were in debt service default as well as technical default are not included in our analysis.

2 In addition to academic studies, anecdotal evidence suggests that technical violations are viewed as important signals of future distress. For example, Iridium LLC recently violated the revenue and customer subscription covenants in an $800 million credit facility, causing $750 million in an additional facility to be in default as well. These technical violations raised questions about the firm being able to make its next interest payment and 'heightened concern that Iridium ... might have to file for bankruptcy

protection from creditors' (*The Wall Street Journal*, August 12, 1999). Bondholders put forth an involuntary Chapter 11 petition the following day.

3 Wilkins (1994) notes that only six percent of firms violating debt covenants between 1978 and 1988 experienced debt service default at the same time as their first technical violation, suggesting that debt service default typically is not the first signal of financial distress (see also Beneish and Press, 1995b). For the 13 firms (approximately five percent) from our original sample that experienced debt service default along with their first technical violation, the change in equity risk is directly comparable to that of our final sample of 182 initial technical violators.

4 Recent research in finance suggests that systematic risk, as measured by beta, is not an adequate proxy for risk that is priced. Dichev (1998) finds that a distress factor, the risk of bankruptcy, is not associated with systematic risk but is rewarded by higher returns. To the extent that beta does not capture the total risk of interest to investors and other parties there is a need to investigate both systematic and unsystematic risk.

5 Studies such as Beneish and Press (1995a and 1995b) use price revisions as a proxy for the information inferred by the market at the time of the violation announcement. Price revisions can be a function of both expected future cash flows and the expected risk of future cash flows. Given that the nature of the covenant violation relates to the underlying risk of the firm, our tests provide a valuable alternative measure of the information associated with debt covenant violations.

6 Similar results obtain if we use sales as the denominator in the measure of profitability (Sweeney, 1994) to reduce the potential impact of strategic accounting policy choices impacting earnings.

7 We also investigated the frequency of auditor changes in our sample of technical violators. Twenty-two of our 182 firms (roughly 12 percent) changed auditors in the year of their first violation. Two changed from a non-Big 6 auditor to another non-Big 6 auditor; nine changed from a non-Big 6 auditor to a Big 6 auditor; one changed from a Big 6 auditor to a non-Big 6 auditor; and ten changed from a Big 6 auditor to another Big 6 auditor. When we restrict our empirical analysis to the 160 firms not changing auditors our results are unchanged. Furthermore, no noteworthy risk-oriented relationships exist within any of the auditor change sub-classifications.

8 Betas estimated using the value-weighted index and the method of Scholes and Williams (1977) exhibit similar trends.

9 Hamada's specification for the unlevered beta assumes that the systematic risk of debt is zero. This assumption is not likely to hold for our sample of firms if covenant violations are associated with increases in default risk. If the risk of default and the systematic risk of debt vary during the period we examine and this variance is not captured completely by changes in financial leverage, the unlevered beta presented in Panel A includes both changes in the asset beta and changes in the systematic risk of debt.

10 Hertzel and Rees (1998) document a mean increase in financial leverage from 1.68 (year −1) to 1.82 (year +1) for their sample of firms privately placing equity securities. The significantly larger mean estimates for our sample of debt covenant violators are consistent with debt covenant violators being more highly leveraged than other firms.

11 The changes in unsystematic risk are found to be equally significant using

the Chi-square test of Healy and Palepu (1990).

12 CHGBKPROB is defined as the year -1 to year $+1$ change in Altman's (1983) Z-score, multiplied by -1 to simplify interpretation of the regression coefficient. In other words, a positive value for CHGBKPROB indicates an increasing probability of bankruptcy.

13 To control for the potential bias arising from the endogeneity of changes in risk and the independent variables presented in equation (3), we used a two-stage approach as a sensitivity test. In the first step, we regressed each risk measure on the remaining independent variables (GC, NOWAIVE, CHGVLEV, CHGBKPROB, and CHGMVE). We then used the residuals from these models in place of CHGSYS and CHGUNSYS in equation (3). Our results using this specification are virtually identical to the results presented in Table 3.

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