

The Effect of the Private Securities Litigation Reform Act of 1995 on the Cost of Equity Capital

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This study examines how the Private Securities Litigation Reform Act (PSLRA) affects financial information quality, as reflected in firms' cost of equity capital. We argue that the passage of PSLRA influences the incentives of those involved in the financial reporting process which in turn affects the firms' financial reporting quality. PSLRA replaced joint and several liability with proportionate liability, providing auditing firms with significant relief from litigation. We contend that the reduction in litigation risk for auditors decreased audit quality. PSLRA also made it more difficult for investors to sue firms for fraud which we argue reduces incentives of managers to report information truthfully. Using the cost of equity capital to proxy for financial information quality, we find that the cost of equity capital increases after the enactment of PSLRA, and the increase is more pronounced for clients of Big N auditors and for firms facing high litigation risk.

Introduction

In 1995 Congress passed the Private Securities Litigation Reform Act (PSLRA) overriding a veto of the Act by President Clinton. PSLRA dramatically changed the private securities legal environment by increasing restrictions on plaintiffs' ability to sue firms and auditors for securities fraud and limiting damage awards to plaintiffs. The purpose of this paper is to examine whether PSLRA had a significant impact on the quality of financial information supplied by firms to capital markets, as proxied by the firms' cost of equity capital.

PSLRA was a response to a perceived explosion in securities litigation which proponents argued was hampering economic growth. An important legal change brought by PSLRA was the elimination of joint and several liability and its replacement with proportionate liability. Prior to PSLRA, plaintiffs could collect the full amount of damages from any defendant found guilty of securities fraud regardless of the level of the defendant's culpability. Under the proportionate liability provisions of PSLRA, however, wrongdoers are responsible only for their fair share of the damages. Auditors and firms are jointly and severally liable only when they knowingly violate securities laws. The passage of PSLRA was, thus, a major victory for auditors and proponents of tort liability reform (Arthur Andersen et al., 1992).

Opponents of PSLRA (which included the plaintiffs' bar, consumer groups, and state securities regulators) argued that PSLRA would discourage not just frivolous lawsuits but also meritorious lawsuits (King and Schwartz, 1997). Seligman (1994) observes that private litigation is often the most effective deterrent for preventing corporate officers and others from defrauding shareholders. Restrictions that make it harder for litigants to file meritorious lawsuits reduce the incentives of corporate officers to disclose information truthfully (Seligman, 1994).

Lee and Mande (2003) argue that PSLRA also negatively impacted audit quality. They suggest that the replacement of joint and several liability with proportionate liability by PSLRA decreased the litigation risk for defendants with deep pockets, including the large accounting firms. They show that due to the reduction in the litigation risk of the large accounting firms after PSLRA, the audit quality of the large accounting firms decreased.

This paper sheds light on the debate about whether PSLRA had a positive or a negative effect on securities markets. In contrast to prior research that has examined stock market reaction to the passage of PSLRA, this study examines whether firms' cost of equity capital is affected by the change in the legal environment following PSLRA. The cost of equity capital is used to proxy for the quality or credibility of financial reporting. We argue that if the passage of PSLRA resulted in a decrease in the quality of financial information due to a reduction in audit quality and/or a reduction in the incentives of management to report truthfully, we should see an increase in firms' cost of capital after passage. Furthermore, because the reduction in audit quality can be expected to be the greatest for Big 6 auditors¹ (Lee and Mande, 2003), after PSLRA, we should see a more pronounced increase in the cost of equity capital for client-firms of Big 6 auditors compared to client-firms of non-Big 6 auditors. Finally, after PSLRA, we should expect firms facing high levels of litigation risk to experience a higher increase in the cost of equity capital than other firms. This is because firms in high litigation prone sectors were provided the greatest

¹Although there are currently only four large accounting firms (i.e., Big 4 firms), there were six large accounting firms during the period of our study. In this study we refer to these firms as the Big 6.

relief from litigation due to the passage of PSLRA and, in turn, should experience the greatest decrease in the incentives of managers to report truthfully. (See, also, Johnson et al., 2000.)

Our results are consistent with these arguments. We find that after the enactment of PSLRA, firms' cost of equity increases as hypothesized. The increase is more pronounced for firms with Big 6 auditors and those facing a high litigation risk. These results are consistent with the idea that after PSLRA a reduction in the litigation risk of client firms and their auditors led to a reduction in the quality of financial reporting and, thus, increased firms' cost of equity capital. These results contribute to the literature by providing new evidence on the impact of PSLRA on financial reporting quality.

The debate over the impact of PSLRA on capital markets was reopened after the financial scandals at Enron and WorldCom. In particular, there is concern that PSLRA may have helped pave the way for the financial reporting irregularities at these firms.² In his testimony to the Senate Commerce, Science, and Transportation Committee, Coffee (2001) argued that the enhanced pleading requirements of PSLRA and the elimination of joint and several liability diminished the legal threat against auditors and management and is one reason why financial reporting quality deteriorated in firms such as Enron.³ In the aftermath of the financial disasters, several bills were introduced in Congress, for example the Accountability for Accountants Act of 2002 introduced by Congressman Edward Markey of Massachusetts that proposed the repeal of the proportionate liability provisions of PSLRA.⁴ The results of this study should help Congress and regulators better understand the impact of PSLRA on reporting quality as they consider future proposals to revise PSLRA and/or take other steps to reduce financial reporting fraud.

The Private Securities Litigation Reform Act of 1995

In response to claims of widespread abuse in private securities litigation, Congress passed the Private Securities Litigation Reform Act (PSLRA) in 1995 (Avery, 1996).⁵ PSLRA is considered to be the most significant piece of securities legislation passed by Congress since the Securities Act of 1933 and the Securities Exchange

²For example, according to the lead lawyer for the plaintiffs in the Enron case, Mr. Lerach, if PSLRA had not passed, management of WorldCom and Enron could have been brought to justice earlier and the financial scandals that unfolded subsequently could have been avoided. See <http://www.cfo.com/article.cfm/3006150?f=TIFarticle062805>.

³See <http://commerce.senate.gov/hearings/121801Coffee.pdf>

⁴House bill is available at <http://thomas.loc.gov/cgi-bin/query/z?c107:H.R.3617>:

⁵One witness at the 1993 Senate Subcommittee hearings on private litigation under the federal securities laws testified that "companies can be exposed to potential litigation whenever the stock price falls by approximately 10 percent, even if there's absolutely no violation of security laws or fiduciary responsibility...Companies, particularly growth firms, argue that they are sued whenever their stock drops" (Seligman, 1994).

Act of 1934 (Johnson et al., 2000). Prior to PSLRA, the 1933 and 1934 securities acts were used to establish liability against management of publicly listed firms and auditors when wrong doing was alleged (King and Schwartz, 1997). PSLRA substantially revised the provisions of these securities acts by including a variety of requirements intended to protect management and auditors from abusive class action litigation. An important feature of PSLRA is that it increased restrictions on a private litigant's ability to sue for investment losses due to securities fraud. Before PSLRA, cases were seldom dismissed for lack of specific evidence supporting allegations of fraud. After PSLRA, however, pleading and discovery requirements were increased: specific evidence must be provided by plaintiffs to show management and/or auditors made fraudulent statements or engaged in fraudulent activity (Spiess and Tkac, 1997).⁶

PSLRA also changed the law by providing a safe harbor to management for forward-looking forecasts included in financial reports that were made in good faith. Prior to PSLRA, management was not permitted to provide forward-looking information, presumably to protect investors from receiving misleading forecasts from management. Opponents of PSLRA argue that the new standards for forward-looking statements are lax and that the act provides too much protection to management for incorrect forecasts. They contend that PSLRA has given management a license to lie about forward-looking financial information and not be sued for making the false forecasts.⁷

There has been a considerable amount of debate about the economic consequences of PSLRA. Using an event study methodology, Spiess and Tkac (1997) and Johnson, Kasznik, and Nelson (2000) examine the market reaction to events relating to the passage of PSLRA. These studies find that stock prices of firms in high litigation risk industries responded positively to PSLRA, suggesting that shareholders in high-litigation-risk industries viewed the passage of PSLRA positively. The results

⁶PSLRA heightened pleading rules. Under PSLRA plaintiffs must provide, at the beginning of the case, specific facts suggesting wrongdoing by defendant. In addition, under PSLRA discovery of facts could not begin until the court decided whether the plaintiffs could go forward with the case. Opponents of PSLRA argued that the heightened pleading and discovery rules made it difficult for investors to bring lawsuits against management and auditors.

⁷See press release of the Consumer Federation of America dated 2/15/2002 available at <http://www.consumersunion.org/finance/securdc202.htm>. There is no disputing the fact that forward-looking forecasts have increased after PSLRA. Johnson et al. (2001), for example, show a significant increase in the frequency of firms issuing forward-looking information after PSLRA, particularly firms at the greatest risk of a lawsuit. The debate has centered around whether these disclosures contain useful information for investors. If the disclosures are made in good faith, the disclosures should decrease information asymmetry and decrease the cost of equity capital (Botosan, 1997). On the other hand, if the disclosures contain misleading information, the cost of capital should increase.

of these studies are consistent with PSLRA restricting unnecessary litigation that was abundant in the pre-PSLRA period and benefiting shareholders by reducing the cost of defending frivolous lawsuits.

In contrast to the studies above, Ali and Kallapur (2001) find that investors in high litigation industries reacted negatively to the passage of PSLRA. Ali and Kallapur suggest that the negative stock market reaction reflects investor expectations that there is an increased probability of management fraud due to the heightened pleading and discovery requirements of PSLRA which make it more difficult for investors to sue management and auditors for false or misleading disclosures.

The event studies above provide conflicting empirical results about the impact of PSLRA on securities markets. They also do not answer the question of whether financial reporting quality improves or deteriorates after PSLRA. For example, results in Spiess and Tkac (1997) and Johnson, Kasznik, and Nelson (2000) do not shed light on whether as a result of cost savings due to a reduction in class-action lawsuits, financial reporting quality improves. And, while the results in Ali and Kallapur (2001) suggest that incentives of management to report financial information truthfully may have decreased after PSLRA, the authors do not *directly* test whether there is a decrease in financial information quality following the passage of PSLRA.

Prior to PSLRA defendants were jointly and severally liable for damages awarded to plaintiffs. Defendants with deep pockets (for example the large accounting firms) could be held liable up to the full amount of the settlement or judgment even if they were responsible for only a small portion of the blame. PSLRA, however, replaced joint and several liability with proportionate liability. Under proportionate liability a defendant is held responsible only for damages attributable to the defendant's actions. Proportionate liability can potentially significantly decrease damage awards to plaintiffs, particularly if the primary defendant were to declare bankruptcy. In such a case the plaintiffs can only recover damages from the solvent defendants and then also only in proportion to their fair share.

The passage of PSLRA was hailed as a victory for auditing firms because it provided significant relief to auditors by limiting damage awards to plaintiffs. As a result, however, audit quality may have decreased in the post-PSLRA period. Chan and Pae (1998) argue that replacing joint and several liability with proportionate liability discourages investor lawsuits against the external auditor which in turn provides the auditor with an incentive to reduce audit effort.⁸ Lee and Mande (2003)

⁸While proportionate liability potentially decreases litigation risk of auditors and, therefore, audit quality, PSLRA also imposes new requirements increasing auditors' responsibility to detect and disclose fraud. The new requirements are intended to increase audit quality. The general expectation, however, is that the decrease in audit quality due to the elimination of joint and several liability is greater than the increase in audit quality due to enhanced requirements regarding auditor duties toward fraud detection (King and Schwartz, 1997).

empirically test whether changes in litigation risk due to PSLRA affect auditors' incentives to curtail earnings management by client managers. They hypothesize that PSLRA discourages meritorious lawsuits and lowers the audit quality of the Big 6 firms who have the highest exposure to litigation. Consistent with expectations, they document that after PSLRA income-increasing discretionary accruals increase for client-firms of Big 6 auditors but not for client-firms of non-Big 6 auditors.⁹

The main research question of this study is whether financial information quality improved or decreased due to changes in the legal environment following the passage of PSLRA. In contrast to Lee and Mande (2003), our study uses the cost of equity capital to proxy for financial reporting quality. The cost of equity capital plays a critical role in the allocation of resources in capital markets (Francis et al., 2004). In the next section, we discuss the use of the cost of capital to proxy for information quality.

Cost of Equity Capital

Agency theory (Jensen and Meckling, 1976) links financial reporting quality to cost of equity capital, suggesting that credible financial information, by reducing information asymmetry between managers and investors, improves market confidence, raises stock prices, and makes it less costly for firms to raise new equity capital.

Cost of capital is related to financial reporting quality through information risk. Francis et al. (2005) define information risk as the likelihood that firm-specific information that is pertinent to investors' decisions is of poor quality. Leuz and Verrecchia (2005) note that firm-specific information risk is a non-diversifiable risk. That is, information risk associated with an individual company's financial accounting reports cannot be diversified by forming a portfolio of stocks. Thus, firm-specific information risk is reflected in a firm's cost of equity capital, which in turn is used by the capital market to allocate economic resources. Investors demand a risk premium for firms with low financial reporting quality, as evidenced by a higher cost of equity capital for these firms.

Prior research provides specific evidence that information risk is linked to cost of equity. Lambert et al. (2007) and Easley and O'Hara (2004) demonstrate analytically that the higher the information risk is, the higher is a firm's cost of equity. Francis et al. (2002) document empirically the association between earnings quality and cost of equity capital. They examine eight proxies for earnings quality and find that firms with lower quality earnings have a higher cost of capital as evidenced by lower debt ratings, larger realized costs of debt, larger industry-adjusted earnings-

⁹Similarly, Geiger and Raghunandan (2001, 2002) find that auditors are less likely to issue a going-concern-modified audit report to a financially stressed client in less litigious periods, suggesting that a reduction in litigation risk increases incentives of auditors to reduce audit effort and quality.

price ratios, and larger equity betas. Their results show that firms with the best earnings quality enjoy discounts of 150-300 basis points in the cost of equity relative to firms with the poorest earnings quality. Botosan et al. (2004) also find an inverse empirical relationship between the cost of equity capital and the quality of publicly announced financial information.

There have also been a few studies that have examined the impact of litigation risk on financial reporting credibility, proxied by firms' cost of equity capital. Snyder and Gonick (1993) note that when the likelihood of litigation decreases, firms' cost of equity capital should increase. They attribute the increase in cost of equity capital to the loss of investor confidence in the ability of the legal system to provide adequate remedies against corporate misconduct. Using the cost of equity capital as a proxy for financial reporting credibility, Khurana and Raman (2004) report that the cost of equity capital of client firms of Big 6 auditors firm increases as the litigation exposure of the Big 6 auditors decreases. The above studies do not, however, examine the effect of a change in the securities legal environment on firms' cost of capital. Our study contributes to this literature by providing some of the first evidence on the effect of the passage of PSLRA on firms' cost of capital.

Hypotheses and Research Design

The purpose of this study is to investigate whether the change in the legal environment due to the passage of PSLRA altered firms' financial reporting quality. Following prior studies (e.g., Khurana and Raman, 2004), we use the *ex ante* cost of equity capital to measure financial information quality. The lower (higher) a firm's financial accounting reporting quality, the higher (lower) is the company-specific information risk, and the higher (lower) will be the company-specific *ex ante* cost of equity capital (Leuz and Verrecchia, 2005). We predict that after PSLRA, due to a reduction in financial information quality and/or audit quality, firms' cost of capital increased. The following is our hypothesis:

H₁: *Ceteris paribus*, subsequent to changes in the legal environment due to the Private Securities Litigation Reform Act of 1995, the *ex ante* cost of equity capital increases.

The following regression model is used to test H₁.

$$\begin{aligned} \text{COSCAP}_{it} = & \alpha_0 + \beta_1 \text{PSLRA}_{it} + \beta_2 \text{AUDTYPE}_{it} + \beta_3 \text{AUDTEN}_{it} \\ & + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} + \gamma_4 \text{LNSIZE}_{it} \\ & + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} + \text{Industry dummies} + \varepsilon_{it} \end{aligned} \quad (1)$$

where:

COSCAP = The *ex ante* cost of equity capital;

PSLRA = An indicator variable representing the legal environment change: 1 for years following PSLRA, and 0 otherwise;

- AUDTYPE = 1 if Big 6 auditor, and 0 otherwise;
- AUDTEN = The number of years that an auditor remains with the same client firm;
- BETA = Stock beta (systematic risk) calculated over 36 months ending in the month of the fiscal year-end;
- LNLEV = Natural log of financial leverage measured by the debt-to-asset ratio as of fiscal year-end;
- VAR = Earnings variability measured by the dispersion in analysts' earnings forecasts available on I/B/E/S during the fiscal year-end month;
- LNSIZE = Natural log of size of the firm measured by the market value of common equity (in million of dollars) as of the fiscal year-end;
- LNBM = Natural log of the ratio of book value of equity to market value of equity as of the fiscal year-end; and
- GROWTH = Forecasted growth measured as the difference between the mean analysts' two and one-year ahead earnings forecasts scaled by the one-year ahead earnings forecast.

In contrast to prior research that has used *ex post* (or realized) returns (e.g., Ali and Kallapur, 2001) to examine the impact of PSLRA, it is worth noting that our dependent variable, the cost of equity capital (COSCAP), is an *ex ante* metric.¹⁰ Previous research suggests several alternative approaches for calculating the *ex ante* cost of equity capital (Gebhardt et al., 2001; Gode and Mohanram, 2003; and Easton, 2004). We employ the PEG approach suggested by Easton (2004) and Botosan and Plumlee (2005) and used in Khurana and Raman (2004). The PEG approach provides a parsimonious measure that is widely used by financial analysts for making stock recommendations (Easton, 2004). It has the advantage that it imposes fewer restrictions on the data used in its computation (Francis et al., 2005) and is also considered by some to be superior to other measures (Botosan and Plumlee, 2005). The cost of equity capital under the PEG approach is estimated as the square root of the inverse of the price-earnings growth ratio:

$$r_e = \sqrt{(\text{eps}_2 - \text{eps}_1) / P_0}$$

where:

- r_e = The *ex ante* cost of equity capital;
- eps_2 = The two-year ahead mean analysts' earnings forecast per share;
- eps_1 = The one-year ahead mean analysts' earnings forecast per share; and

¹⁰The widespread use of *ex post* or realized returns in the finance and accounting literature is mostly due to the fact that expected or *ex ante* returns are not observable. Recent literature (e.g., Gebhardt et al., 2001; Fama and French, 1997) suggests, however, that measures of *ex ante* rather than *ex post* returns are more appropriate for tests of the relevance of accounting information for asset valuation.

P_0 = The fiscal year-end price per share.

Equation (1) includes control variables identified by prior studies as factors influencing the cost of equity capital. Following Khurana and Raman (2004) who show that firms' cost of capital is related to differences in the audit quality of auditors (Big 6 versus non-Big 6), auditor type (AUDTYPE) is included as a control variable. AUDTYPE is expected to have a negative sign because clients of Big 6 auditors are likely to have smaller cost of equity capital. Auditor tenure (AUDTEN) is a determinant of audit quality and, thus, influences cost of equity capital, although we do not predict the direction of this relationship because empirical results showing the impact of auditor tenure on audit quality are mixed (Boone et al., 2005).

We include a variety of risk measures in our regression model. Stocks' beta (BETA) is included in the model because it is positively correlated with cost of capital (Ogneva et al., 2007). Based on prior research (e.g., Gebhardt et al., 2001) which suggests that high financial leverage implies a high cost of capital, leverage (LNLEV) is included in the model. There is empirical evidence (Barth et al., 1999) that firms with stable earnings experience a lower risk premium.¹¹ Thus, the variability of earnings (VAR), which we expect to be positively correlated with the cost of equity capital, is included in the model.

The market value of equity, a proxy of a firm size, is inversely associated with risk (Khurana and Raman, 2004). As a result, the firm size (LNSIZE) is expected to have a negative association with cost of capital. High book to market ratio (LNBM) is reported to reflect lower growth opportunities, lower accounting conservatism, and/or high perceived risk (Gode and Mohanram, 2003). Thus, LNBM is expected to have a positive association with cost of capital.

We include earnings growth (GROWTH) as a control variable because there is a positive association between growth and risk. For example, Gode and Mohanram (2003) note that high-growth firms are generally viewed by the stock market to be risky. Finally, we control for industry-specific risk using industry dummies because Gebhardt et al. (2001) find that industry effects are important in explaining cross-sectional differences in cost of equity capital.

PSLRA, the test variable, represents the change in the cost of equity capital after the enactment of PSLRA. We predict that PSLRA will have a positive and significant coefficient which will support our hypothesis that the passage of PSLRA increased financial information risk and, therefore, firms' cost of equity capital.

To increase confidence in our test results, we employ two additional tests. First, we examine whether the effects of PSLRA vary depending on auditor type: Big 6 versus non-Big 6. We advance the argument that reductions in audit quality will be more pronounced for Big 6 auditors after PSLRA (Lee and Mande, 2003) and, there-

¹¹Risk premium is the difference between the implied cost of equity capital and the nominal risk free rate.

fore, the cost of equity capital will increase to a greater extent for client-firms of Big 6 auditors. Hypothesis H₂ is stated below:

H₂: *Ceteris paribus*, subsequent to changes in the legal environment due to the Private Securities Litigation Reform Act of 1995, the *ex ante* cost of equity capital increases more for Big 6 clients than non-Big 6 clients.

The following regression model is used to test H₂. We expect that the coefficient on the interaction variable HIAUDEXP*PSLRA, which measures incremental effect of PSLRA on the cost of capital of Big 6 clients, will be positive. The coefficient on LOWAUDEXP*PSLRA, which measures the incremental effect of PSLRA on non-Big 6 auditees, also is expected to be positive but smaller than that on HIAUDEXP*PSLRA.

$$\begin{aligned} \text{COSCAP}_{it} = & \alpha_0 + \beta_1 \text{HIAUDEXP*PSLRA}_{it} \\ & + \beta_2 \text{LOWAUDEXP*PSLRA}_{it} + \beta_3 \text{AUDTYPE}_{it} \\ & + \beta_4 \text{AUDTEN}_{it} + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} \\ & + \gamma_4 \text{LNSIZE}_{it} + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} \\ & + \text{Industry dummies} + \varepsilon_{it} \end{aligned} \quad (2)$$

where:

- COSCAP = The *ex ante* cost of equity capital;
 AUDTYPE = 1 if Big 6 auditor, and 0 otherwise;
 PSLRA = An indicator variable representing the legal environment change: 1 for years following PSLRA, and 0 otherwise;
 HIAUDEXP*PSLRA = Interaction between Big 6 auditor and PSLRA 95;
 LOWAUDEXP*PSLRA = Interaction between non-Big 6 auditor and PSLRA 95;
 AUDTEN = The number of years that an auditor remains with the same client firm;
 BETA = Stock beta (systematic risk) calculated over 36 months ending in the month of the fiscal year-end;
 LNLEV = Natural log of financial leverage measured by the debt-to-asset ratio as of fiscal year-end
 VAR = Earnings variability measured by the dispersion in analysts' earnings forecasts available on IBES during the fiscal year-end month;
 LNSIZE = Natural log of size of the firm measured by the market value of common equity (in million of dollars) as of fiscal year-end;
 LNBM = Natural log of the ratio of book value of equity to market value of equity as of fiscal year-end; and

GROWTH = Forecasted growth measured as the difference between the mean analysts' two and one-year ahead earnings forecasts scaled by the one-year ahead earnings forecast.

In our second test, we examine whether PSLRA impacts the cost of capital differently for firms facing high and low degrees of litigation risk. We argue that by making it more difficult for investors to bring lawsuits, PSLRA provides firms facing high risks of litigation more legal relief than firms not facing these high risks. We contend that the reduction in litigation risk for firms facing high levels of litigation increased the incentives of managers of these firms to commit fraud and report untruthfully to shareholders. It is worth noting that the litigation prone high-technology industries had joined the accounting profession in lobbying Congress to pass PSLRA (Johnson et al., 2000). Consistent with our hypothesis, Ali and Kallapur (2001) empirically document that shareholders in the high-litigation-risk industries reacted negatively to PSLRA's provisions restricting shareholders' ability to bring securities-related lawsuits. The hypothesis to be tested is as follows:

H₃: *Ceteris paribus*, subsequent to changes in the legal environment due to the Private Securities Litigation Reform Act of 1995, the *ex ante* cost of equity capital increases more for firms facing high litigation risk than firms facing low litigation risk.

The following regression model is used to test H₃:

$$\begin{aligned} \text{COSCAP}_{it} = & \alpha_0 + \beta_1 \text{HISUIT}_{it} + \beta_2 \text{HISUIT*PSLRA}_{it} \\ & + \beta_3 \text{LOWSUIT*PSLRA}_{it} + \beta_4 \text{AUDTEN}_{it} \\ & + \beta_5 \text{AUDTYPE}_{it} + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} \\ & + \gamma_4 \text{LNSIZE}_{it} + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} \\ & + \text{Industry dummies} + \varepsilon_{it} \end{aligned} \quad (3)$$

where:

HISUIT (LOWSUIT) = An indicator variable with a value 1 for a given year a firm's litigation score is greater (smaller) than or equal to the median litigation score of the entire sample, 0 otherwise;

HISUIT*PSLRA = Interaction between HISUIT and PSLRA 95;

LOWSUIT*PSLRA = Interaction between LOWSUIT and PSLRA 95; and

All other variables = Defined previously.

High litigation prone firms are defined as firms whose litigation score calculated using Stice (1991) is greater than or equal to the median litigation score of the entire sample. HISUIT is a dummy variable representing the high litigation risk firms. The coefficient on HISUIT is expected to be positive because the cost of capital of high litigation risk firms should be higher than the cost of capital of other firms. A posi-

tive coefficient on HISUIT*PSLRA, an interaction variable which represents incremental effects of PSLRA on high litigation risk firms would show support for hypothesis, H₃. We expect this coefficient to be larger than that on LOWSUIT*PSLRA.

Table 1—Data Collection and Distribution

Panel A: Procedures Used For Data Collection		
Procedures	Firm-Years	
Group 1: Firms listed on both IBES and Compustat	14,717	
Group 2: Group 1 firms whose eps1 forecast is available	14,704	
Group 3: Group 2 firms whose eps2 forecast is available	14,243	
Group 4: Group 3 firms whose eps1 and eps2 are positive	12,571	
Group 5: Group 4 firms whose eps2 is greater than eps1	12,067	
Group 6: Group 5 firms whose fiscal year closing stock price is available on Compustat	11,887	
Group 7: Group 6 firms whose stock price data for Beta are available on CRSP	11,204	
Group 8: Group 7 with financial data for independent variables available on Compustat	9,729	
Group 9: Group 8 firms that are not financial institutions	8,929	
Final Sample: Group 9 firms that are not 1995 fiscal year.	7,677	

Panel B: Distribution of Observations by Industry		
Industry	Number of Firm Years	Percent of Sample
Agriculture	23	0.30
Mining/Construction	154	2.01
Food	246	3.20
Textile/Printing/Publishing	671	8.74
Chemical	268	3.49
Pharmaceutical	223	2.90
Extractive	271	3.53
Durable Manufacturers	2,176	28.34
Transportation	437	5.69
Utilities	279	3.63
Retail	1,170	15.24
Services	624	8.13
Computers	1,090	14.20
Others	45	0.59
Total	7,677	100.00

Sample Selection

Our initial sample consists of all firms listed on both I/B/E/S International and Compustat databases during the three years before and after PSLRA. The sample period, thus, spans the years 1992 through 1998. The unavailability of data on the databases used in this study reduces the sample size as shown in Table 1, Panel A. The PEG approach (Botosan and Plumlee, 2005) requires earnings forecasts to be positive and the two-year ahead earnings forecasts to be greater than the one-year ahead forecasts. Due to this restriction, 2,650 firm years are eliminated from the initial sample of 14,717 firm years. Unavailability of complete firm-data on Compustat and CRSP further decreases the sample by 2,338 observations. Finally, financial

institutions and observations for the year 1995¹² are eliminated to arrive at the final sample of 7,677 firm-years representing 2,236 firms.¹³ Panel B shows the sample composition by industry. The sample is dominated by firms belonging to the following three industries: durable manufacturers (28.34 percent), retail (15.24 percent), and computers (14.20 percent).

Table 2—Descriptive Statistics (N = 7,677)

Variables	Mean	Median	SD
AUDTYPE	0.9452	1.0000	0.2277
HIAUDEX*PSLRA	0.5903	1.0000	0.4918
LOWAUDEX*PSLRA	0.0380	0.0000	0.1923
AUDTEN	9.5230	7.0000	7.3263
BETA	1.0135	0.8602	0.9086
LEVERAGE	0.4759	0.4875	0.2014
VAR	0.0385	0.0200	0.0857
SIZE	3279.7600	433.6588	12665.5600
BOOK TO MARKET	0.4911	0.4185	0.3362
GROWTH	0.5583	0.2222	2.1368

Variable definitions:

- AUDTYPE = 1 if Big 6 auditor, and 0 otherwise;
- HIAUDEX*PSLRA = Interaction between Big 6 auditor and PSLRA 95;
- LOWAUDEX*PSLRA = Interaction between non-Big 6 auditor and PSLRA 95;
- PSLRA = An indicator variable representing the legal environment change: 1 for years following PSLRA, and 0 otherwise;
- AUDTEN = The number of years that an auditor remains with the same client firm;
- BETA = Stock beta (systematic risk) calculated over 36 months ending in the month of the fiscal year-end;
- LEVERAGE = Total debt divided by total assets;
- VAR = Earnings variability measured by the dispersion in analysts' earnings forecasts available on IBES during the fiscal year-end month;
- SIZE = Size of the firm measured by the market value of common equity (in million of dollars) as of fiscal year-end;
- BOOK TO MARKET = Book value of equity divided by market value of equity as of fiscal year-end; and
- GROWTH = Forecasted growth measured as the difference between the mean analysts' two and one-year ahead earnings forecasts scaled by the one-year ahead earnings forecast.

Descriptive Statistics

Table 2 shows descriptive statistics of the variables used in the analyses. Summary statistics for the mean, median, and standard deviations for each variable are provided. The mean of AUDTYPE is 0.9452, indicating that 94.52 percent of the

¹²Similar to Lee and Mande (2003), the transition year 1995 is eliminated.

¹³Similar to Lee and Mande (2003), we checked for sensitivity of our results by requiring that all variables used in the regression be continuously available over the entire sample period for all the firms in our sample. While this reduced our sample size to 3,036 firm-years (506 firms) and lowered statistical significance for some of the variables, our conclusions were unchanged.

firms during our sample period are audited by Big 6 auditors. The mean of (median) of auditor tenure (AUDTEN) is 9.523 (7) years. The mean (median) firm size is 3,279 (433) millions of dollars. The mean (median) leverage ratio is 0.4759 (0.4875) which is higher than that reported in Khurana and Raman (2004). The relatively high leverage ratio in our study may be due to the fact that our firms are larger in size than those in Khurana and Raman's sample. The Pearson correlation matrix (not reported) shows that the variables are not highly correlated with the exception of AUDTYPE and LOWAUDEXP*PSLRA ($\rho=-0.82$) in model (2).¹⁴

Table 3—Cost of Equity Capital of Non-Big 6 and Big 6 Auditees before and after PSLRA

Panel A: Big 6 vs. Non-Big 6 Auditees before PSLRA										
Variables	N	Big 6			N	Non-Big 6			Wilcoxon	
		Mean	Median	SD		Mean	Median	SD	t-value	Z-value
COSCAP	2,724	0.0934	0.0803	0.0554	129	0.1171	0.1099	0.0560	4.75***	5.97***

Panel B: Big 6 vs. Non-Big 6 Auditees after PSLRA										
Variables	N	Big 6			N	Non-Big 6			Wilcoxon	
		Mean	Median	SD		Mean	Median	SD	t-value	Z-value
COSCAP	4,532	0.1034	0.0908	0.0605	292	0.1305	0.1126	0.0752	7.29***	7.34***

Panel C: Before PSLRA vs. After PSLRA for Big 6 Auditees										
Variables	N	Before PSLRA			N	After PSLRA			Wilcoxon	
		Mean	Median	SD		Mean	Median	SD	t-value	Z-value
COSCAP	2,724	0.0934	0.0803	0.0554	4,532	0.1034	0.0908	0.0605	7.08***	8.75***

Panel D: Before PSLRA vs. After PSLRA for Non-Big 6 Auditees										
Variables	N	Before PSLRA			N	After PSLRA			Wilcoxon	
		Mean	Median	SD		Mean	Median	SD	t-value	Z-value
COSCAP	129	0.1171	0.1098	0.0560	292	0.1305	0.1126	0.0752	1.81*	1.31

t- and Z-values are based on two-tailed tests. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. COSCAP is ex ante cost of equity capital

Table 3 compares cost of equity capital of client-firms of Big 6 and non-Big 6 auditors before and after PSLRA. Panels A and B show that before and after PSLRA the cost of capital of non-Big 6 client-firms is greater than that of Big 6 client-firms, and the differences are significant at the one percent level using both the t-test and the Wilcoxon Z-test. These results are consistent with the argument that Big 6 auditors provide higher quality assurance services compared to non-Big 6 auditors. Panels C and D of Table 3 show the changes in cost of capital following the passage of PSLRA for Big 6 firms and non-Big 6 firms, respectively. For Big 6 client-firms,

¹⁴We separate the sample according to AUDTYPE (i.e., clients of Big 6 and non-Big 6 auditors) and analyze separately the effect of PSLRA on each group using a year dummy for 1995 (PSLRA95). The findings are supportive of model (2) showing that PSLRA had a statistically significant (insignificant) effect on the cost of capital of clients of Big 6 (non-Big 6) auditors. (Results not reported.)

the cost of capital increases significantly after PSLRA, while the change in cost of capital of non-Big 6 firms after PSLRA is marginally significant using the t-test and insignificant using the Wilcoxon Z-test. These univariate results are consistent with our prediction that the cost of equity capital increases after PSLRA and that the increase is more pronounced for Big 6 auditees.

Regression Test Results of Hypothesis H₁

Table 4 reports multivariate regression results of our tests. The regression examines whether the legal changes due to PSLRA influence the *ex ante* cost of equity capital after controlling other factors affecting the cost of capital. As the adjusted R² shows, the variables used for this analysis explain more than 40 percent of the cross-sectional variation in firms' cost of capital. All coefficients on the control variables except auditor tenure (AUDTEN) are significant at the one percent level of significance and are in the expected direction. The coefficient on auditor tenure (AUDTEN) is negative and marginally significant. The market assigns a higher cost of equity capital to firms with higher beta, leverage, earnings variability, book-to-market ratio, and growth, while it assigns a lower cost of equity capital to bigger firms. These results are generally consistent with theory and findings of prior studies (e.g., Botosan and Plumlee, 2002).

The coefficient of greatest interest is that on PSLRA, which is positive and statistically significantly related to cost of capital (one percent level with two-tailed test). This result supports our hypothesis, H₁ that the cost of equity capital increases after the enactment of PSLRA. In specific, the effect of PSLRA is to increase the cost of equity by 1.32 percent.¹⁵

Regression Test Results of Hypotheses H₂ and H₃

In model (2) of Table 5, the variables of interest for testing H₂ are the two interaction variables, HIAUDEXP*PSLRA and LOWAUDEXP*PSLRA. The coefficients on these two variables are positive and significant at the one percent and ten percent levels, respectively. These results suggest that the cost of capital increased for Big 6 and non-Big 6 auditees after PSLRA. Big 6 clients, however, experienced a higher increase in cost of capital compared to non-Big 6 clients. Specifically, the cost of equity of Big 6 clients increased 1.34 percent, while that of non-Big 6 clients increased 0.95 percent. The difference is statistically significant (F-value = 12.87; p-value = 0.000, two-tailed). This result supports H₂ that an

¹⁵The following are the diagnostics for multicollinearity. The highest variance inflation factors (VIFs) and condition index is 1.59 (11.88) without industry dummy variables. Including industry dummy variables increases these diagnostics; however, the magnitudes and significance of coefficients are qualitatively the same. Thus, we report the coefficients and t-values with the industry dummy variables included.

increase in the cost of capital is more pronounced for firms with Big 6 auditors because PSLRA provides greater relief from litigation to the Big 6 auditors.

Table 4—Regression Model Comparing Cost of Equity Capital Before and After PSLRA

$$\text{COSCAP}_{it} = \alpha_0 + \beta_1 \text{PSLRA}_{it} + \beta_2 \text{AUDTYPE}_{it} + \beta_3 \text{AUDTEN}_{it} + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} + \gamma_4 \text{LNSIZE}_{it} + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} + \text{Industry dummies} + \varepsilon_{it} \quad (1)$$

Variables	Coefficients	t-values
INTERCEPT	0.1891	24.50***
Auditor Characteristics		
PSLRA	0.0132	12.02***
AUDTYPE	-0.0113	-4.80***
AUDTEN	-0.0001	-1.77*
Control Variables		
BETA	0.0059	9.24***
LNLEV	0.0173	16.21***
VAR	0.1079	16.82***
LNSIZE	-0.0126	-34.51***
LNBM	0.0153	16.77***
GROWTH	0.0076	30.45***
F-value	246.11***	
Adjusted R ²	0.4126	
N	7,677	

t-value is based on a two-tailed test. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. To keep the presentation brief, the industry dummies are not reported

Variable definitions:

- COSCAP = The ex ante cost of equity capital;
- PSLRA = An indicator variable representing the legal environment change: 1 for years following PSLRA, and 0 otherwise;
- AUDTYPE = 1 if Big 6 auditor, and 0 otherwise;
- AUDTEN = The number of years that an auditor remains with the same client firm;
- BETA = Stock beta (systematic risk) calculated over 36 months ending in the month of the fiscal year-end;
- LNLEV = Natural log of financial leverage measured by the debt-to-asset ratio as of fiscal year-end
- VAR = Earnings variability measured by the dispersion in analysts' earnings forecasts available on IBES during the fiscal year-end month;
- LNSIZE = Natural log of size of the firm measured by the market value of common equity (in million of dollars) as of fiscal year-end;
- LNBM = Natural log of the ratio of book value of equity to market value of equity as of fiscal year-end; and
- GROWTH = Forecasted growth measured as the difference between the mean analysts' two and one-year ahead earnings forecasts scaled by the one-year ahead earnings forecast.

Model (3) of Table 5 reports the multivariate regression results of the tests of Hypothesis H₃. The coefficient on HISUIT is positive and highly significant, implying that the cost of equity for firms with high litigation scores is significantly

Table 5—Regression Models Comparing Cost of Equity Capital Before and After PSLRA for Firms audited by Big 6/non-Big 6 Auditors and for Firms facing High/Low Litigation Risk

$$\text{COSCAP}_{it} = \alpha_0 + \beta_1 \text{HIAUDEXP*PSLRA}_{it} + \beta_2 \text{LOWAUDEXP*PSLRA}_{it} + \beta_3 \text{AUDTYPE}_{it} + \beta_4 \text{AUDTEN}_{it} + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} + \gamma_4 \text{LNSIZE}_{it} + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} + \text{Industry dummies} + \varepsilon_{it} \quad (2)$$

$$\text{COSCAP}_{it} = \alpha_0 + \beta_1 \text{HISUIT*PSLRA}_{it} + \beta_2 \text{LOWSUIT*PSLRA}_{it} + \beta_3 \text{HISUIT}_{it} + \beta_4 \text{AUDTYPE}_{it} + \beta_5 \text{AUDTEN}_{it} + \gamma_1 \text{BETA}_{it} + \gamma_2 \text{LNLEV}_{it} + \gamma_3 \text{VAR}_{it} + \gamma_4 \text{LNSIZE}_{it} + \gamma_5 \text{LNBM}_{it} + \gamma_6 \text{GROWTH}_{it} + \text{Industry dummies} + \varepsilon_{it} \quad (3)$$

Variables	Big 6 vs. Non-Big 6 Model (2)		High Versus Low Litigation Model (3)	
	Coefficients	t-values	Coefficients	t-values
INTERCEPT	0.1917	22.77***	0.1809	23.35***
Auditor Characteristics				
HIAUDEXP*PSLRA	0.0134	11.90***		
LOWAUDEXP*PSLRA	0.0095	1.95*		
HISUIT*PSLRA			0.0154	9.82***
LOWSUIT*PSLRA			0.0099	6.54***
HISUIT			0.0079	4.17***
AUDTYPE	-0.0140	-3.35***	-0.0099	-4.22***
AUDTEN	-0.0001	-1.77*	-0.0000	-0.19
Control Variables				
BETA	0.0059	9.24***	0.0041	6.21***
LNLEV	0.0173	16.22***	0.0173	16.32***
VAR	0.1080	16.82***	0.1075	16.87***
LNSIZE	-0.0126	-34.51***	-0.0117	-31.31***
LNBM	0.0153	16.78***	0.0159	17.51***
GROWTH	0.0076	30.44***	0.0079	30.53***
F-value	235.40***		233.11***	
Adjusted R ²	0.4126		0.4207	
N	7,677		7,672	

t-value is based on a two-tailed test. *, **, and *** indicate significance at the 10, 5, and 1 percent levels, respectively. To keep the presentation brief, the industry dummies are not reported

Variable definitions:

- HIAUDEXP*PSLRA = Interaction between Big 6 auditor and PSLRA 95;
- LOWAUDEXP*PSLRA = Interaction between non-Big 6 auditor and PSLRA 95;
- HISUIT (LOWSUIT) = An indicator variable with a value 1 for a given year a firm's litigation score is greater (smaller) than or equal to the median litigation score of the entire sample, 0 otherwise;
- HISUIT*PSLRA = Interaction between HISUIT and PSLRA 95;
- LOWSUIT*PSLRA = Interaction between LOWSUIT and PSLRA 95; and
- All other variables = Defined previously

higher than of firms with low litigation scores.¹⁶ The difference in costs of capital represents the risk premium demanded by investors for investing in high litigation risk firms. When the two interaction variables, HISUIT*PSLRA and

¹⁶We lost five observations due to the unavailability of the data necessary to calculate Stice's (1991) litigation score.

LOWSUIT*PSLRA, are included in the model, we find the coefficients on these variables are also positive and highly significant, suggesting that both high and low litigation risk firms have a higher cost of equity after PSLRA. The high litigation risk firms, however, experience a greater increase in cost of capital (1.54 percent) compared to the increase in cost of capital of the low litigation risk firms (0.99 percent) (F-value = 74.20; p-value = 0.000, two-tailed). This result supports H₃ and provides additional support for the argument that the legal environment change due to PSLRA adversely impacts firms' cost of equity capital.

Additional Tests

While we control for factors that have been shown by previous research to affect the cost of capital, a challenge for our study (and also for studies similar to ours on this topic) has been to control for economy-wide events that also may have impacted the cost of capital. We attempt to control for the economy-wide changes during our test period in two ways. First, we include changes to gross domestic product (GDP) as an additional control variable to proxy for changes in economy-wide conditions. (See also Cohen et al., 2008.)¹⁷ We find statistically insignificant coefficients on changes in GDP (results not shown) with qualitatively unchanged coefficients on all other variables. Second, following Dhaliwal et al. (2007), we replace our proxy for cost of equity capital (our dependent variable) with the implied equity premium, estimated as the cost of equity capital minus the risk-free return (the yield on 10-year U.S. Treasury bonds). We find similar results (not tabulated) to those shown in Tables 4 and 5.

We also check the robustness of our results by examining the effect of the Securities Litigation Uniform Standards Act of 1998 (SLUSA) on the cost of capital. This act, considered an integral part of PSLRA, closes a loophole in PSLRA by mandating that securities class-action suits be tried in federal courts rather than in state courts (Brooks and Wang, 2004). Specifically, SLUSA makes it more difficult for investors to frustrate the application of PSLRA by bringing class action lawsuits in state courts. We analyze changes in cost of capital two years before and after SLUSA and find that there is a statistically significant increase in cost of equity capital after the passage of SLUSA, and this is more pronounced for firms with Big N auditors and high litigation risk, compared to years prior to SLUSA (results not tabulated). This finding confirms our hypothesis that reductions in companies' litigation risk may have led to lower financial reporting quality, in turn, increasing the cost of equity capital.

¹⁷We obtained GDP data from U.S. Department of Commerce's Bureau of Economic Analysis (www.bea.gov/national/xls/gdpchg.xls). GDP is reported quarterly, so firms with a fiscal year end (FYE) in the same quarter have the same values of annual GDP change. For example, for all firms with a FYE of January, February, and March we use the GDP change reported in the first quarter.

Finally, we include a proxy for the quality of corporate governance because prior studies (i.e., Gompers et al., 2003) find that corporate governance quality is associated with the cost of equity. Following Gompers et al. (2003), we include the G-index (available on Investor Responsibility Research Center, Inc.'s database) as an independent variable to control for the quality of a firm's corporate governance.¹⁸ Results showing the effect of PSLRA on cost of capital (not tabulated) remain virtually unchanged after the inclusion of the corporate governance index.

Conclusion

This study is interested in examining whether the change in the private securities legal environment due to PSLRA impacted financial information quality as measured by firms' cost of equity capital. We build on previous literature showing how changes in the legal environment influence the extent to which incentives of managers and auditors are altered in the financial reporting process. While PSLRA was intended to reduce frivolous lawsuits against firms and auditors, certain provisions of the act also discourage meritorious lawsuits. If PSLRA makes it more difficult for investors to sue auditors and managers for their wrongdoing, financial reporting quality could decrease. We argue that the reduced litigation risk due to PSLRA provides incentives to managers to be less truthful in their financial statement disclosures, which increases firms' cost of capital. We also argue that there is reduction in litigation risk facing auditors after PSLRA which adversely affects audit quality and in turn increases the financial information risk of firms and their cost of equity capital.

Consistent with our hypothesis, we find that firms' cost of equity capital increases after the passage of PSLRA, suggesting financial information quality deteriorated after PSLRA. Additional tests show that client-firms of Big 6 auditors experience a higher increase in cost of capital compared to client-firms of non-Big 6 auditors. This is consistent with a more pronounced reduction in the audit quality of Big 6 auditors following the passage of PSLRA. We also find that the cost of equity capital for firms facing high litigation risk increases more than that of firms facing a low litigation risk. This supports our hypothesis that firms with high litigation risk experience a greater amount of relief due to PSLRA which in turn provides managers with incentives to reduce financial information quality.

While eliminating litigation abuse is a worthwhile goal to pursue, the impact on capital markets from corporate fraud that goes undetected or unpunished if class

¹⁸The G index developed by Gompers et al. (2003) captures the degree to which the firm can be characterized as a dictatorship or a democracy with regard to shareholders' rights. It is constructed using 24 corporate governance provisions. IRRC reported this index for 1990, 1993, 1995, 1998, and 2000. Following Bebchuk and Cohen (2005), we fill in a missing year's index using the index of the previous year. For example, for 1996 there is no available index; we assume that the index for 1996 is the same as for 1995.

actions become difficult to file requires careful consideration by Congress and regulators (Snyder and Gonick, 1993). The financial scandals at Enron and WorldCom underscore this issue. At the heart of the debate is whether PSLRA diminished the legal threat to management and auditors and contributed to recent financial reporting disasters.¹⁹ While this study cannot prove whether PSLRA is responsible for the financial reporting failures at Enron and WorldCom, evidence is provided in this paper that financial reporting quality, as evidenced by cost of capital, deteriorated after PSLRA. Our findings should be of interest to Congress and regulators as they consider amendments to PSLRA or other proposals to reduce financial reporting fraud.

A possible extension of this study is to consider more carefully the role of corporate governance variables in moderating the impact of PSLRA on firms' cost of capital. Another topic for future research is to examine the different ways in which auditors are coping with changes in litigation risk due to PSLRA, including changes in audit quality and planning, changes in audit fees, changes in the issuance of modified opinions, and changes in their client portfolios. (See also Krishnan and Krishnan, 1997.)

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¹⁹There is little doubt about this matter as far as Mr. Lerach, the lead attorney for the plaintiffs in the Enron case, is concerned. According to Lerach, who has referred to PSLRA as the Corporate License to Steal Act, "there is no question that the 95 act emboldened executives to think they could do whatever they wanted."

See <http://www.cfo.com/article.cfm/3006150?f=TIFarticle062805>.

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