PSLRA and Litigation Backed Investor Speculation

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ABSTRACT

It is widely accepted that by protecting market participants from losses due to bad investment choices, there will be less preliminary scrutiny and caution in their future investment. One such ex post remedy is shareholder litigation, which allows some shareholders to recover their losses in court, albeit at the expense of current and long-term shareholders. Following the release of uncertain information, the stock is worth more to new investors who have the option to sue, than it is for existing shareholders who do not. We examine how changes to the value of this option, through the passage of the Private Securities Litigation Reform Act (PSLRA) in 1995, affected investors' incentive to speculate and drive up prices. We find that the market reaction is inversely proportional to the level of firm over-valuation, with the quality of a firm's information environment a significant predictor of the market reaction for those firms in the highest over-valuation quartile. These results are consistent with shareholder litigation being a contributing factor to market bubbles.

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ABSTRACT

It is widely accepted that by protecting market participants from losses due to bad choices, there will be less preliminary scrutiny and caution in their future investment. One such ex post remedy is shareholder litigation, which allows some shareholders to recover their losses in court, albeit at the expense of current and long-term shareholders. Following the release of uncertain information, the stock is worth more to new investors who have the option to sue, than it is for existing shareholders who do not. We examine how changes to the value of this option, through the passage of the Private Securities Litigation Reform Act (PSLRA) in 1995, affected investors' incentive to speculate and drive up prices. We find that the market reaction is inversely proportional to the level of firm over-valuation, with the quality of a firm's information environment a significant predictor of the market reaction for those firms in the highest over-valuation quartile. These results are consistent with shareholder litigation being a contributing factor to market bubbles.

1. Introduction

It is well accepted within the economics literature, as well as by market participants and regulators alike, that when you prevent investors from suffering negative outcomes in their investments ex post, you lower the incentives they have to carefully investigate those investments ex ante. This increase in moral hazard allows investors to pay less attention to the risk of an investment; instead shifting the focus to only the potential upside payoff. Unfortunately, this idea has come to the forefront of economic discussion as we debate the relative costs and benefits of government bailouts for industry, or distortions in real estate prices due to government backing of mortgages. Yet as we observe the debate, it becomes clear that while the theory is well understood, there is a wide disparity in how people view its validity and importance. In this paper, we investigate empirically whether changes in one such ex post remedy available to

investors, shareholder lawsuits, affected the propensity of investors to speculate in equity markets.

Cornell (1990) shows that any litigation creates a valuable real option for the plaintiff, regardless of the merits of the case. But unlike derivative lawsuits in state courts, where one shareholder sues the firm on behalf of all shareholders of the firm, securities litigation only protects those shareholders who purchased their shares after some event or announcement misleads the market about the underlying value of the firm[1]. For instance, if the CEO of a firm announces quarterly results that are inflated by accounting manipulations, it is assumed that only those investors who purchased the shares based on the false information were harmed. In effect, securities litigation makes the stock more valuable for new shareholders, who have the option to sue for damages, than it is for existing investors who do not have that option in the period following the release of "uncertain" information. As new investors bid up the price of the asset based on their higher valuation, they expand the bubble beyond what it would have been had no option existed.

It is important to stress that we do not suggest that shareholder litigation is the cause of the over-valuation. Companies release information continuously, any of which might lead investors to change their valuation of the firm and speculate on the information being accurate. Our contribution is that we show shareholder litigation makes speculation "cheaper" and exacerbates the existing price bubble as the value of the option is also incorporated into the price of the shares. This is especially true as the variance in signal quality increases, and this litigation option becomes more valuable to

new investors who are in a better position to speculate on it being accurate, knowing that they can recover a portion of the cost of misrepresentation.

While the contribution of this paper is that we show shareholder litigation affects the ex ante pricing within markets and can exacerbate bubbles, the importance of our results lies in the investment distortions created by encouraging such speculation. Certainly, those shareholders who correctly time the market and sell out at a higher price to a speculator, who is willing to pay more based on the ability to recover damages, has received an undeserved benefit from shareholder litigation. Unfortunately, those who benefit from the artificially high prices are not the ones who must pay damages to new shareholders who gambled based on uncertain information. Instead, it is the firm's long-term, buy and hold investors who must pay the damages to those shareholders who purchased shares during the fraud period. This reduces the profitability of long-term investing relative to attempts to time the market. In addition, when market speculators price securities above their true intrinsic value, they implicitly lower the firm's cost of equity financing, potentially distorting the firm's investment decisions and leading to over-investment.

Certainly, an argument could be made that it is difficult to know, ex ante, which company announcements are fraudulent, making it impossible to take advantage of such an option. In fact, were it possible to know for certain whether new information was either true or fraudulent, there would be no need for litigation as an efficient market would discount the false information and quickly incorporate the true. In reality, investors are forced to set prices based not only on the new information, but also the

[1] Coffee (2006) does an excellent job in describing the limitations of shareholder litigation, and the wealth

likelihood it is accurate until confirming evidence enters the market. Because we can't identify individual firms who might be cheating, we instead develop a simple model based on features of real options and shareholder litigation to make empirical predictions regarding when the option would be most valuable, and what we would expect to see when reforms were passed into law which made it more difficult to recover damages ex post. We then test these hypothesis using market returns surrounding the passage of the Private Securities Litigation Reform Act of 1995.

In the early 1990s, large decreases in a firms' stock price were often followed by a race to the courthouse, in the hopes of becoming the lead plaintiff in a class-action lawsuit against the firm. It was a common view that lawsuits were often filed against firms, with the plaintiffs hoping to find the evidence to support the claims through the discovery process. Additionally, firms faced large legal costs when defending or settling these fraud lawsuits, regardless of whether they were guilty. To lessen the impact on firms, the Private Securities Litigation Reform Act (PSLRA) was passed in 1995. This reform made four major changes to the existing statutes; each lessening the potential liability of firms. Because this also reduced the value of the real option, we expect that we will find a negative price response to the passage of this law for those firms where this option is most valuable; particularly those trading at higher than normal valuation ratios and those with poor corporate governance.

Several studies have shown the PSLRA reforms to be effective. Johnson, Nelson and Pritchard (2007) and Choi (2007) examine litigation patterns and find that the reforms have generally reduced the occurrence of nuisance litigation. And Perino (2002)

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shifting aspects of shareholder litigation.

finds that PSLRA may not have had the effect that Congress intended. There are more class action securities lawsuits, but he notes that the quality of these suits is much higher.

However, it is still an open question whether the reforms were beneficial for investors. Certainly, for those investors with legitimate claims and injury from fraud, it is now more difficult to obtain redress. However, by making it easier for managers to issue unbiased forecasts, rather than the worst case forecast which prevents liability, these reforms may have improved the information available to investors, while also significantly decreasing the risk and costs of frivolous litigation reaching court. Therefore, the passage of the reform was seen as a positive event for the market in general, as documented by Spiess and Tkac (1997) and Ali and Kallapur (2001), who show that there was a positive market reaction during the legislative passage and signing of the reform[2].

In order to isolate the value of the option, we control for factors previously found to have caused differential effects during the PSLRA passage. Spiess and Tkac (1997) document an industry effect in the initial reactions. Although disputed by Ali and Kallapur (2001), they find negative abnormal returns for those firms in industries with the highest numbers of lawsuits before the reforms, consistent with a litigation option being valuable. Johnson, Kasznik and Nelson (2000) also weigh in on this issue, finding that for most of the high-tech firms in their sample, there was a positive reaction to the reforms. However, for those firms most likely to be sued, there was a negative reaction on

[2] Some researchers have used the market reaction to the announcement of shareholder litigation to show that it is costly for shareholders. Griffin, Grundfest and Perino (2004), and Ferris and Pritchard (2001) both analyze the market reaction to various events during the class action process and document significantly negative reactions. Gande and Lewis (2006) suggest that these results are understated, as the market will potentially factor in the costs of litigation to a firm when other firms in its industry are sued.

average. Cook and Wang (undated working paper) show that firms with higher analyst coverage benefitted more from the passage of the law. This implies that companies with higher transparency benefited, while companies with worse information environments were more negatively affected by the passage of PSLRA. These results are again consistent with the view that the litigation option became less valuable post-reform.

Our results are also consistent with this hypothesis. We find that the share price reaction to the legislative introduction of the law was significantly and negatively related to the level of overvaluation for the firm. We also show that this is true after controlling for factors that have previously been found to be related to a negative reaction, such as the governance characteristics of the firm, analyst coverage or industry. In fact, after sorting our firms into high (and low) litigation risk portfolios based on industry, we find that the firms with higher litigation risk did have more negative stock reactions, but it was mainly focused in those firms with abnormally high valuations. Firms trading at low valuation ratios relative to their historical market to book ratio reacted positively (with firms in the high litigation risk portfolios enjoying higher positive returns than low risk companies), while there was a significantly negative price response for those firms trading at high relative values. Furthermore, these results are economically significant.

We also find that corporate governance and the level of analyst coverage did impact how the market reacted at the announcement of PSLRA. An alternative hypothesis could be suggested that because it is easier for firms with less analyst coverage or worse governance to cheat, making it more difficult to sue actually increases the likelihood of management committing a fraud in the future. Because the existing, long-run shareholders bear the cost of litigation, we would expect to see more negative

reactions on the part of investors in these firms. However, and contrary to this alternative hypothesis, we do not find the quality of governance or analyst coverage to be significant explanatory variables in any of the quartiles other than the most over-valued. This result is consistent with our model, where uncertainty regarding the accuracy of the signal increases the value of the option and exacerbates existing over-valuation.

These results are also economically significant. Based on our overvaluation measure, the average overvaluation for the firms in the highest quartile is 272.87 million dollars. At the introduction of PSLRA, this overvaluation was reduced by an average of 11.75 million dollars, or -4.3% of the bubble. As a comparison, Cox, Thomas and Bai (2008) calculate provable losses of securities class actions prior to PSLRA to have a mean of 382 million (median equal to 55 million) and the average settlement to be 13% of provable losses (9% median). And Bajaj, Mazumdar and Sarin (2000) find that the amount paid in a settlement relative to the size of potential damages ranged from 2.0% for small settlements, up to 15.73% for settlements greater than one hundred million.

The paper is organized as follows. In Section 2, we discuss the history of the Private Securities Litigation Reform Act and its passage timeline, as well as its impact on the litigation option value. We then present a simple model of price formation after the release of information to the market, and use it to develop our hypothesis. In Section 3 we discuss the methodology, and define how we determine which firms are over-valued. We also discuss the data sources for our study and how we define our subgroups. In Section 4 we report our results and in Section 5 we conclude.

2. The impact of the PSLRA on the value of the option to sue

Because firms were faced with real costs in protecting themselves from nuisance lawsuits, Congress introduced the Private Securities Litigation Reform Act on January 4, 1995 with broad, bipartisan support for the bill, including that of President Clinton. After Congress passed the PSLRA on December 6, 1995, it was expected that it would be quickly enacted. However, on December 19, President Clinton unexpectedly vetoed the bill, even though there was more than enough support within Congress, who overrode the presidential veto on December 22, 1995, making it a law. While the focus of our tests is on the introduction date of January 4th, we also analyze the later dates as well.

The reforms contain four major changes that significantly affected the ability and incentives of shareholders to sue the firm. The first change creates a "safe harbor" for forward looking statements as long as these statements include adequate cautionary statements. This allows managers to release more information to investors, while making it more difficult for shareholders to use managerial announcements as the cause for a shareholder lawsuit. Second, PSLRA delays the discovery process until after the defendant firm's motion for dismissal. This clause prevents so called "fishing expeditions", where investor-plaintiffs used the discovery process in order to find cause for their lawsuits. This decreases the probability that a suit will be heard, effectively decreasing the likelihood of shareholders recovering damages from the firm. Third, PSLRA limits the amount of liability of corporations. Prior to PSLRA, firms were liable up to three times the damages under the Racketeer Influenced and Corrupt Organizations (RICO) Act. The passage of PSLRA limits the liability of a firm to only the actual monetary damages of the investor. Fourth, under PSLRA, the plaintiff who has the largest stake in the proceedings is given preference as the lead plaintiff in a class action. PSLRA

also prohibited extra compensation to lead plaintiffs and other extra fees, making it less valuable to be the first case filed. This clause also effectively decreased the value of being the initial investor-plaintiff in a lawsuit. Overall, the passage of PSLRA decreased both the probability of winning the litigation and the potential payoff, therefore lowering the ex ante value of the litigation option.

In order to examine how changes in the rules governing shareholder lawsuits affected shareholders and their incentives to speculate on information, we must first show how this ability to sue ex post affects share price following the release of uncertain information. We develop a simple model to estimate the value of this option, and derive hypothesis which we can use to test the validity of our theory.

In this model, there are three periods. At time zero, the firm is worth V_0, which is the true, underlying value of the firm. At that time, the firm releases a noisy signal that would indicate the firm is worth an additional positive amount, X. Because it is a noisy signal, there is a probability, P, that the information is true, and (1 – P) that the information is actually worth zero. Following the release of the information, the market creates an intermediate valuation for the firm, V_1, which it retains until the validity of the information is revealed at time two, and the firm's value is V_2. If the information is found to be false, shareholders who purchased shares at time one based on the fraudulent information will be able to recover a portion of their losses, represented by d.

If the information is true, then V_2 will be:

$$V_{2,true} = V_0 + X \qquad (1)$$

And if the information is false, then V_2 will be:

$$V_{2,false} = V_0 + 0 \qquad (2)$$

Therefore, for a risk-neutral existing investor who does not have the ability to sue, the value of V_1 would be:

$$V_1 = P (V_0 + X) + (1 – P) V_0$$

$$= V_0 + PX \quad (3)$$

Among other factors, damages in shareholder litigation are a function of the difference between what the investor paid following the release of the misleading information, and the value of the firm when the truth regarding the information is revealed. So the potential damages in a lawsuit would be:

$$V_1 – V_{2,false} = PX \quad (4)$$

And we can now calculate the value of V_1 for a risk-neutral shareholder who has the ex post option of a shareholder lawsuit to recover a portion, d, of their damages:

$$V_{1*} = P (V_0 + X) + (1 – P) (V_0 + dPX)$$

$$= V_0 + PX + dPX – dP^2X \quad (5)$$

Finally, we can determine the value of the litigation option by taking the difference between the value of the firm to a new shareholder who has the option to sue, V_{1*}, and an existing shareholder who does not, V_1:

$$V_{1*} – V_1 = dPX – dP^2X \quad (6)$$

From this simple model, we find the three key relationships that we examine in our empirical tests. First, the option value is directly related to the likelihood and percentage of damages being recovered through a shareholder suit. Second, the option value is inversely related to the probability the information is true. Finally, the option value is directly related to the value of the new information. When firms are trading further from their true value based on uncertain predictions or information, we would

expect the option value to be higher. Note that the option does not create the change in price brought about by the new information; it only serves to amplify it.

Based on equations 4 and 6, as well as common methodology used in estimating damages, we would expect that the option value to sue will be highest for those securities in which high value signals have lead investors to price shares at higher multiples than previously employed. These higher multiples could be caused by the announcement of unexpectedly high earnings, a change in perceived rate of growth or a multitude of other factors to which investors must assign a likelihood of being truthful. Whether caused by speculation, or by rational analysis of the data, this over-valuation is a necessary condition for the option to be valuable. If there is no over-pricing, there are no damages to recover in a lawsuit and the option is worthless.

The ratio of the market-to-book equity (M/B) has been used in many studies as an indicator of misvaluation. For instance, Rhodes–Kropf et al. (2005) use market to book as a measure of overvaluation in explaining merger waves. But previous studies have also shown that valuation ratios such as the market to book ratio can reflect potential firm growth or agency problems within the firm[3]. To control for this, we do not focus solely on whether the firm has a high market-to-book ratio; which may or may not be higher than its usual multiple. Instead, we focus on a firm's overvaluation relative to its long-term intrinsic value to find those firms where new information or speculation is more likely to have inflated the value of the firm beyond its usual levels. Therefore, we use a

[3] There is a strong industry influence on a firm's market-to-book ratio. For robustness, we use the raw market-to-book ratio instead of our scaled measure in all our tests. The results are very similar. However, when using unscaled market-to-book ratios in creating our quartiles, all the firms in our highest quartile come from those industries found in previous studies to have had the highest likelihood of shareholder litigation. Our normalized measure creates quartiles that are more balanced across industries.

historical average M/B ratio to represent a smooth level of intrinsic valuation, and scale each firm's market to book ratio at the introduction of the law by its historical average to get a measure of overvaluation at that time.

Because the option to sue is more valuable when there is greater overvaluation, we hypothesize that there will be a significantly more negative reaction at the introduction of PSLRA, for those firms that are most overvalued. This negative relationship will also exist on dates previously identified by Spiess and Tkac (1997) as important to the law's eventual passage. One criticism of this approach might be that given simple reversion to the mean, we would expect the same result on any random date; high valued firms will decline in value, while low valued firms will increase. To rule this out, we also predict a significantly positive relationship between the level of over-valuation and abnormal returns on the day President Clinton unexpectedly vetoed the law making passage uncertain. So our first hypothesis is:

> H1: Firms who are most likely to be over-valued will have the most negative reaction to the events leading to the passage of PSLRA, but will react the most positively to events that make its passage less likely.

Certainly, over-valuation isn't a perfect proxy for those firms likely to be sued. It could have been just as likely that an average firm, trading at its historical level, could issue an earnings report that hid significant losses from investors, and it would have been just as liable in a lawsuit. However, we would suggest that on average, the over-valued firms are those where speculation is most likely to be occurring. And if the option to sue is valuable when you are forced to speculate on the accuracy of information, this is the group which will be the most affected.

However, over-valuation is only one factor that determines the value of the litigation option. Our model shows that it is also affected by the likelihood that the information released is true. For those firms where speculation is most likely, the option will be worth more when the information environment or quality of firm governance makes the information released to the market more uncertain. Therefore, we would expect a more negative reaction to the reforms when firms have worse corporate governance and less analyst coverage. Furthermore, because the litigation option is only valuable when there are potential damages from over-valuation, we would expect there to be a differential effect across all firms. Quality of governance will be the most relevant to those firms who are most likely to be overvalued and less important when there is not overvaluation. So we now have a second testable hypothesis.

> H2: The market reaction to the law will be positively related to the quality of corporate governance, especially for firms that are most likely to be overvalued.

3. Data and Research Methodology

We begin by utilizing all firms listed in CRSP and Compustat at the time of the reform passage, 1995, and then remove all financial and utility firms. We then remove those firms whose price was below five dollars, and are left with a sample of 3580 firms that we use in measuring the market's reaction to the reforms. We test the effect of the passage by first determining which firms are overvalued relative to their historical levels. As in Barber and Lyon (1997), we determine the M/B ratio of all of the firms by calculating the book-to-market ratio based on market value of equity at the end of the previous calendar year, t-1, and book value of equity reported on a firm's balance sheet in

the same calendar year. We average these M/B ratios for the five fiscal years prior to 1995 to estimate the historical, or intrinsic, M/B values for each of the firms. We define the level of over-valuation as the scaled market to book for each firm at the beginning of 1995 as:

$$ScaledM/B_i = \frac{M/B_{i,1994}}{M/B_{i,Historical}} \quad (7)$$

where $M/B_{i,1994}$ is the M/B_i of firm i as of December of 1994 and $M/B_{i,historical}$ is the average M/B of firm i over the prior five years. If $ScaledM/B_i$ is greater than one, then the firm's valuation level is higher than the intrinsic value. Since we group our firms based on the Scaled M/B relative to other firms, the market level of over/under valuation will only increase or decrease the Scaled M/B for all firms and not affect the relative over/under valuation of the firms in relation to each other.

For robustness, we also sort the firms along two other dimensions. First, we sort the firms by their actual M/B and group them into quartiles. And because the law was passed eleven months after the initial introduction of the legislation, the level of overvaluation may have changed during that time. In order to control for that, we also sort the firms by the November 30, 1995, M/B and scaled M/B characteristics and rerun the study. In each case, the firms with the highest valuations are in the fourth quartile, while those with the lowest are in the first.

Panel A of Table 1 shows the descriptive statistics for each of the portfolios. We see that even when the portfolios are sorted solely on M/B the scaled M/B increases monotonically and when the portfolios are sorted by scaled M/B the M/B of the portfolios

likewise increases monotonically. This suggests that even though the composition of the groups change, there is significant overlap between the groups.

In Panel B, we examine industry representation within the quartiles and find that three specific industries dominate the highest valuation quartile. The first is the healthcare industry, which includes the pharmaceutical and bio-tech sectors. Next is the business equipment industry, which contains firms involved with software development and personal computing. Finally, personal and business service industries represent a major part of the quartile. These industries coincide with those that Spiess and Tkac (1997) found to have had a negative reaction to passage of PSLRA.

Consistent with Spiess and Tkac, we examine four event dates. January 4, 1995 was the date the legislation was first introduced in Congress, and December 6, 1995 was the date of the passing vote for the final version of the law. December 19, 1995 was the date President Clinton unexpectedly vetoed the bill and on December 22, 1995 Congress overrode the veto and passed the legislation into law. The a priori expectation of the reactions for the high scaled market to book portfolio is: A negative reaction on January 4, December 6 and December 22 and a positive reaction on December 19. For robustness, we estimate abnormal returns using the Fama French (1993) and Carhart (1997) four factor model, the market model, as well as raw returns. Since our quartiles are formed on the basis of the market to book ratio, we also estimate the abnormal returns based on the four factor model without the inclusion of the HML loading factor. We estimated abnormal returns over three event windows; (-1,1), (-1,0), (0,1). Although, we only report the results for the period beginning the day before the event date to the day following the event date, our results were similar using any of the three event windows.

In order to estimate the four factor model, we use daily returns from June 1994 until November 1994 to estimate each firm's loading factors to be used in the January 1995 event date and we use daily returns from May 1995 until October 1995 to estimate the factor loadings for the three December event dates. We regress the following:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,m}(R_{m,t} - R_{f,t}) + \beta_{i,smb}SMB_t + \beta_{i,hml}HML_t + \beta_{i,umd}UMD_t + \varepsilon_{i,t} \quad (8)$$

where $R_{m,t}$ is the return on the market, $R_{f,t}$ is the risk free rate, SMB_t is the size factor, HML_t is the value minus growth factor and UMD_t is the momentum factor. Because we sort based on market-to-book, we also measure returns without the HML_t factor. The SMB_t, HML_t and UMD_t factors are obtained from Kenneth French's website[4]. Using the models in equations 2 and 3, we obtain estimates for the intercepts and the factor loadings for each firm. We then calculate each firm's abnormal return during the event window by calculating:

$$FF\_ret_{i,t} = R_{i,t} - (R_{f,t} + \hat{\alpha}_i + \hat{\beta}_{i,m}(R_{m,t} - R_{f,t}) + \hat{\beta}_{i,smb}SMB_t + \hat{\beta}_{i,hml}HML_t + \hat{\beta}_{i,umd}UMD_t) \quad (9)$$

For robustness, we again recalculate abnormal returns leaving out the HML factor. Finally, we estimate abnormal returns using the standard market model[5], using the same estimation windows.

We then examine whether the level of over-valuation retained its ability to explain market returns after controlling for other factors, such as industry, the quality of corporate governance and analyst coverage. As a measure of governance quality, we obtain values from Gompers, Ishii and Metrick's (2003) governance index[6]. We utilize

[4] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html
[5] For a complete description of the methodology, see Campbell, Lo and MacKinlay (1997)
[6] http://finance.wharton.upenn.edu/~metrick/data.htm

IBES to obtain the number of analyst estimates for the firm. The intersection between the GIM data set, IBES and our previous sample contains 821 firms. We utilize the four factor adjusted returns as the dependent variable in each of our models, although the results are similar using our other returns measures as well.

4. Empirical Results

Table 2 reports the abnormal returns at the introduction of the PSLRA. Panel A shows the overall market reaction. Contrary to previous studies, we find a negative reaction to the introduction of the law using raw returns and the market model estimates of abnormal returns. Panel B shows the abnormal returns of each of the quartiles when sorted by the standard market to book ratio. We find, consistent with our hypothesis, that regardless of how abnormal returns are calculated, there is a monotonic decrease in the returns from the smallest market to book quartile to the largest. Additionally, we find that the difference between each of the three quartiles and the fourth quartile is statistically significant. Panel C shows the abnormal returns of each of the quartiles when sorted by the scaled market to book ratio. Again, we find consistent with our hypothesis that there is a monotonic decrease in abnormal returns in the groups. We also find that the differences between the first two quartiles and the fourth quartile are always significant, but the significance is lost in the difference between the third and fourth quartiles. These results are consistent with our hypothesis that there was a strong relationship between overvaluation and market reaction when there was a decrease in the value of the option to sue. Firms with high M/B and high scaled M/B reacted more negatively to the introduction of the PSLRA.

Table 3 shows the returns for the same scaled, market to book quartiles, except each quartile is split into two sub-portfolios based on whether the firm is in a high litigation risk industry. Previous research has found that the market reaction was more negative for these firms, and in general, our results would support that. However, we find that it again depends on the level of market valuation. There is a positive reaction to the law in the lower scaled valuation quartiles whether you are in a high risk industry or not. In fact, the firms in the high risk portfolios enjoyed a more positive return on average than the low risk firms, albeit not significantly different. However, among firms in the higher valuation quartiles, those in the high risk portfolios suffered significantly more negative returns than the low risk firms. These results are consistent with the market valuing the real option to sue, and certainly it is worth more to those shareholders in industries with higher occurrences of shareholder litigation. However, even among the high risk firms, the same monotonic relationship exists that also is found among low risk firms. The higher the valuation of the firm, the more negative the market response to the introduction of the PSLRA.

Table 4 shows the abnormal returns around the three December event dates. We report only abnormal returns using the four factor model, but other models were also estimated and were quantitatively similar. As mentioned in the methodology section, these firms have been resorted and grouped based on their M/B and scaled M/B at the end of November as the time between introduction and passage was nearly a full year. We find the results are not as strong as at the introduction date. While the sign of the average reaction is what we predicted for the highest valuation quartile, the monotonic relationship between quartiles disappears, as does the significance of the difference

between groups. This is likely due to the market already incorporating information relevant to the legislation into prices over the course of the year. Despite this information leakage, we still find in the cross-section that the level of over-valuation is still a significant determinant of the market's reaction.

However, the market reaction to President Clinton's veto on December 19th is very important. Because we are focusing on firms trading at very high valuations, it would be reasonable to suggest that on any random day they would revert back towards their long-term means, and a negative abnormal return over any window should not be a surprise. However, after initially indicating his support for the PSLRA, President Clinton unexpectedly vetoed it instead. In this case, our hypothesis would suggest that the reaction would be positive for speculators, and we would see a negative reaction for low market to book stocks and a positive reaction for high valuation firms. This is indeed what we find, and again, our results support our hypothesis that shareholder litigation encourages speculation in the market.

We then analyze whether our returns evidence is robust to the introduction of other variables that have been found to be significant factors in explaining the market's response to the PSLRA. Table 5 reports the results of a regression of abnormal returns around the introduction date, January 4, on the Scaled M/B and other explanatory variables. When the scaled market to book is the only variable included, we find it to be negative and highly significant as would be expected based on our univariate results. This is consistent with our hypothesis that when the over-valuation of the firm is higher, the more negatively impacted the firm will be by the decrease in the value of the option to litigate. We then add in the various control variables separately, and finally, altogether in

the model. And we find that adding the additional explanatory variables does not change the sign nor the significance of the scaled market to book variable. In addition, we find that firms in the services and electronics sectors had a significantly positive reaction, consistent with Ali and Kallapur (1997), and inconsistent with Spiess and Tkac (1997). Also, consistent with Cook and Wang (undated), we find that the reaction was more positive for firms with greater analyst coverage. The quality of corporate governance was not a significant factor in any specification.

When examining the range of values for the Scaled M/B ratio, we find that there is not a lot of dispersion in the measure of over-valuation. It could be possible that rather than the level of valuation being important, it is whether or not you are over-valued that matters. In order to test this, we create an indicator variable that is equal to one if the firm is in the largest quartile, and zero otherwise. Table 6 reports the results using the same specifications as before, with the exception that the high Scaled M/B dummy was used instead. Consistent with our earlier results, we find that being in the highest valuation quartile lead to a significantly more negative reaction on January 4. When we include the additional variables, the coefficient on the dummy variable remains significant, and negative. The coefficients on the control variables remained consistent with the previous model specifications using the each firm's actual Scaled M/B value.

In Table 7, we report the results of regressing our Scaled M/B ratio on the abnormal returns surrounding the three December event dates. We find that the coefficient on the scaled market to book ratio is, as predicted, significant and negative on December 16, the day of the final congressional vote. Again, and consistent with our hypothesis, the reaction to the presidential veto was significantly more positive for firms

with higher levels of over-valuation. And on the date the veto was over-ridden, they reacted more negatively, but not significantly so. These results clearly support our hypothesis that when the probability of passage increased and the option value to litigate decreased, the market reacted negatively for those firms which were overvalued. And when the probability of passage decreased and the option value to litigate increased, the firms which were overvalued received a more positive market reaction.

However, to this point we have only analyzed the first of our hypothesis, which was that the price response to key events during the passage of the PSLRA would be dependent on the level of speculation in each firm. But we also believe that corporate governance and the information environment of the firm will play a role as well. Certainly, the option to sue should be most valuable when there is greater uncertainty regarding the truthfulness of information released by the firm. But similar to high-risk industries, an alternative hypothesis could be suggested that firms with worse corporate governance or information environments would also be the most likely to cheat in general, and given that PSLRA made it more difficult to punish them, investors of these firms would react more negatively in general to the introduction of PSLRA. In this case, we should see a direct relationship between a firm's corporate governance and information environment and the initial market reaction to the introduction of the law. However, our model would indicate that these factors are marginal and most relevant when investors are speculating on the firm's value to begin with. If there is no mispricing, there are no damages to recover regardless of how bad governance is.

Therefore, if our hypothesis is correct, we would find that these factors are more important for firms in the highest valuation quartile, where speculation is the most likely

to be occurring. In Table 8, we report the results of a regression of our return measure on the governance index variable, number of analysts, as well as control variables for each of the four quartiles. Consistent with our hypothesis, we find that in our highest valuation quartile, firms with fewer analysts and worse corporate governance had a significantly more negative reaction to the introduction of PSLRA. But this was not the case in the other three quartiles where they were insignificant factors in explaining the market's response. This is again consistent with a real option explanation, and when combined with the results in Table 3, does not support the market reaction being based on litigation becoming more likely for firms in high risk industries, or having bad governance or information environments.

5. Conclusion

Prior to the passage of PSLRA, speculators invested in firms with the belief that they may be able to recover a portion of their losses through litigation. These speculative investors cause the market prices of those securities to increase above their intrinsic levels. By passing PSLRA, Congress effectively decreased the option value to sue. The market prices for the firms that were the target of these speculative investors corrected closer to their intrinsic levels and their market value decreased.

Our findings show that during the events leading up to the passage of PSLRA, the market response depended a great deal on the level of over-valuation for a firm. We find that when the reform bill was introduced, decreasing the value of the option to litigate, firms who were more likely to be over-valued (measured relative to their long-term average valuation) suffered worse losses in the market. Not surprisingly, this option was most valuable for investors in high litigation risk industries, and those with worse

information environments. Therefore the losses were exacerbated by these factors, but for the most part only for those firms where speculation is likely to be occurring; those with the highest levels of overvaluation. For firms trading closer to their long-term valuation levels, corporate governance or industry has little ability to predict the market response to the securities litigation reforms. These results give credence to the belief that the ability to sue ex post, increases the willingness to speculate on firm value ex ante. Potentially, this could also distort the cost of raising equity for firms, leading firms to over-invest in marginal projects. Also, it raises another negative cost imposed upon markets by shareholder litigation, in comparison to the potential benefits it creates as a deterrent against managerial malfeasance.

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Table I
Descriptive Statistics of each of the Quartiles

Panel A shows the equally weighted quartile portfolios when ranked as of year end 1994. Market Value is the number of shares outstanding multiplied by the share price on December 30, 1994. Book Value is the equity book value. M/B is the market-to-book ratio of the firms. Scaled M/B is the M/B scaled by the firm specific average M/B over the previous 5 years. Each panel is broken down into M/B groupings as well as Scaled M/B groupings. Panel B shows the number of firms from each industry that is in the specific quartile. Differences in number of observations are due to some firms' SIC code not corresponding to one of Fama-French's 30 industry classification.

Panel A:

	Quartile	No Obs	Market Value	Book Value	M/B	Scaled M/B
Market-to-Book	1	894	461.57	399.47	1.058	0.857
	2	895	1300.93	721.46	1.775	0.923
	3	895	1356.88	493.14	2.722	0.955
	4	896	1717.13	332.97	8.642	1.098
Market-to-Book Scaled	1	895	621.05	285.16	2.611	0.563
	2	894	1140.97	461.82	2.846	0.847
	3	896	1764.21	680.50	2.842	1.018
	4	895	1311.00	519.24	5.907	1.406

Panel B:

	M/B Quintile				Scaled M/B Quintile			
Industry	1	2	3	4	1	2	3	4
Food Products	15	15	21	20	19	17	12	23
Beer & Liquor	4	2	3	6	4	3	1	7
Tobacco Products	1	2		2			2	3
Recreation	22	17	19	27	29	18	21	17
Printing and Publishing	9	6	21	18	13	9	9	23
Consumer Goods	26	17	23	16	16	25	13	28
Apparel	22	9	8	6	18	12	6	9
Healthcare, Medical Equipment, Pharmaceutical	23	39	82	182	90	47	60	129
Chemicals	9	17	23	24	16	13	16	28
Textiles	13	8	1	1	8	6	5	4
Construction and Construction Materials	56	37	31	22	30	31	35	50
Steel Works Etc.	33	22	11	7	20	17	14	22
Fabricated Products and Machinery	34	44	43	43	32	27	40	65
Electrical Equipment	11	20	33	64	36	15	18	59
Automobiles and Trucks	16	12	20	4	18	7	10	17
Aircraft, Ships and Railroad Equipment	7	5	7	3	3		4	15
Precious Metals, Non-Metallic, and Industrial Metal	7	13	10	6	7	11	7	11
Coal	2	1	1		2		1	1
Petroleum and Natural Gas	53	49	38	19	28	34	50	47
Communications	5	25	37	50	30	21	24	42
Personal and Business Services	48	44	98	259	106	70	81	192
Business Equipment	46	71	100	175	82	50	57	203
Business Supplies and Shipping Containers	19	21	16	12	7	14	21	26
Transportation	36	35	20	19	28	21	28	33
Wholesale	42	44	53	52	57	31	45	58
Retail	73	50	35	51	76	50	38	45
Restaurants, Hotels, Motels	25	21	23	33	42	16	20	24
Other	4	4	6	3	6	3	1	7

Table II

Abnormal Returns at Announcement of Legislation

Abnormal returns are calculated using the four factor model as specified by Fama and French (1993) and Carhart (1997), the Carhart specification minus the HML factor, and the standard market model. Market-to-book quartiles for Panel B are calculated by ranking the market-to-book ratios and grouping the firms within quartiles. Scaled market-to-book quartiles for Panel C are calculated by finding the monthly average M/B for each firm from 1990-1994 and scaling the market to book on the announcement date by each firm's average MB. The scaled MB are then sorted and grouped into quartiles. In order to estimate the Fama-French Carhart factor loadings, we used daily returns from June 1994 until November 1994 to estimate loading factors. The (-1,1) event window results are shown, although other event windows had quantitatively similar results. Mean 4-x is the mean difference between the 4th quartile and the respective quartile. The final column shows the p-value for a t-test of difference of means between the 4th quartile and the respective quartile. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Panel A: All Firms

	Quartile	N	Mean		p	Mean Q4-x		p-value
Four Factor		3546	0.0014		0.1939			
Four Factor - HML		3546	0.0016		0.1410			
MM		3546	-0.0042	***	0.0000			
Raw		3546	-0.0032	***	0.0008			

Panel B: M/B

	Quartile	N	Mean		p	Mean Q4-x		p-value
Four Factor	1	890	0.0084	***	0.0001	-0.0146	***	0.0000
	2	885	0.0036	*	0.0676	-0.0098	***	0.0016
	3	886	-0.0002		0.9131	-0.0060	*	0.0608
	4	885	-0.0062	***	0.0098			
Four Factor	1	890	0.0096	***	0.0000	-0.0177	***	0.0000
- HML	2	885	0.0049	**	0.0113	-0.0130	***	0.0000
	3	886	-0.0001		0.9620	-0.0080	**	0.0138
	4	885	-0.0081	***	0.0012			
MM	1	890	0.0053	***	0.0059	-0.0199	***	0.0000
	2	885	-0.0005		0.7491	-0.0141	***	0.0000
	3	886	-0.0067	***	0.0003	-0.0079	***	0.0053
	4	885	-0.0146	***	0.0000			
Raw	1	890	0.0068	***	0.0004	-0.0209	***	0.0000
	2	885	0.0004		0.8029	-0.0145	***	0.0000
	3	886	-0.0059	***	0.0011	-0.0082	***	0.0034
	4	885	-0.0141	***	0.0000			

Panel C: Scaled M/B

	Quartile	N	Mean		p	Mean Q4-x		p-value
Four Factor	1	890	0.0177	***	0.0000	-0.0252	***	0.0000
	2	885	0.0003		0.8601	-0.0078	***	0.0066
	3	886	-0.0050	***	0.0080	-0.0025		0.3602
	4	885	-0.0075	***	0.0004			
Four Factor	1	890	0.0186	***	0.0000	-0.0259	***	0.0000
- HML	2	885	-0.0003		0.8690	-0.0070	**	0.0193
	3	886	-0.0046	**	0.0144	-0.0027		0.3244
	4	885	-0.0073	***	0.0005			
MM	1	890	0.0118	***	0.0000	-0.0245	***	0.0000
	2	885	-0.0047	*	0.0881	-0.0080	***	0.0021
	3	886	-0.0110	***	0.0000	-0.0017		0.4941
	4	885	-0.0127	***	0.0000			
Raw	1	890	0.0124	***	0.0000	-0.0243	***	0.0000
	2	885	-0.0035	*	0.0510	-0.0084	***	0.0012
	3	886	-0.0097	***	0.0000	-0.0022		0.3883
	4	885	-0.0119	***	0.0000			

Table III

Abnormal Returns at Announcement of Legislation Sorted by Litigation Risk of Industry

Abnormal returns are calculated using the four factor model as specified by Fama and French (1993) and Carhart (1997), the Carhart specification minus the HML factor, and the standard market model as well as raw returns. Scaled market-to-book quartiles are calculated by finding the monthly average M/B for each firm from 1990-1994 and scaling the market to book on the announcement date by each firm's average MB. The scaled MB are then sorted and grouped into quartiles, and then separated based on whether they are in an industry found in previous studies to have a higher risk of shareholder litigation.. In order to estimate the Fama-French Carhart factor loadings, and the market model estimation, we used daily returns from June 1994 until November 1994 to estimate loading factors. The (-1,1) event window results are shown, although other event windows had quantitatively similar results. High – Low is the mean difference between the high litigation risk firms in that quartile and the other firms in that quartile, with the p-value of a t-test of difference of means given. Mean Q4-x is the mean difference between the 4th quartile and the respective quartile, with the p-value for a t-test of difference of means between the 4th quartile and the respective quartile given. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Panel A: Four Factor Model

	Quartile	N	Mean	High - Low	p-value		Mean Q4-x		t-test
High Lawsuit Risk	1	476	0.0208	0.0049	0.327		-0.0303	***	0.000
Industries	2	398	-0.0029	-0.0047	0.265		-0.0065		0.166
	3	403	-0.005	-0.0007	0.846		-0.0045		0.306
	4	501	-0.0095	-0.0049	0.237				
Low Lawsuit Risk	1	414	0.0159				-0.0205	***	0.000
Industries	2	487	0.0018				-0.0063	*	0.088
	3	483	-0.0042				-0.0003		0.927
	4	384	-0.0046						

Panel B: Four Factor – HML

	Quartile	N	Mean	High - Low	p-value		Mean Q4-x		t-test
High Lawsuit Risk	1	476	0.0198	0.0046	0.366		-0.0282	***	0.000
Industries	2	398	0.0000	-0.0006	0.868		-0.0084	*	0.063
	3	403	-0.0041	0.0015	0.688		-0.0043		0.342
	4	501	-0.0084	-0.0019	0.660				
Low Lawsuit Risk	1	414	0.0152				-0.0217	***	0.000
Industries	2	487	0.0006				-0.0071	*	0.055
	3	483	-0.0056				-0.0009		0.812
	4	384	-0.0065						

Panel C: Market Model

	Quartile	N	Mean	High - Low	p-value		Mean Q4-x		t-test
High Lawsuit Risk	1	476	0.0134	0.0034	0.457		-0.0293	***	0.000
Industries	2	398	-0.0072	-0.0047	0.191		-0.0087	**	0.031
	3	403	-0.0144	-0.0063	0.050	**	-0.0015		0.720
	4	501	-0.0159	-0.0072	0.061	*			
Low Lawsuit Risk	1	414	0.0100				-0.0187	***	0.000
Industries	2	487	-0.0025				-0.0062	*	0.068
	3	483	-0.0081				-0.0006		0.845
	4	384	-0.0087						

Panel D: Raw

	Quartile	N	Mean	High - Low	p-value		Mean Q4-x		t-test
High Lawsuit Risk	1	476	0.0142	0.0038	0.394		-0.0295	***	0.000
Industries	2	398	-0.0065	-0.0055	0.121		-0.0088	**	0.026
	3	403	-0.0131	-0.0062	0.055	*	-0.0022		0.582
	4	501	-0.0153	-0.0077	0.044	**			
Low Lawsuit Risk	1	414	0.0104				-0.0180	***	0.000
Industries	2	487	-0.0010				-0.0066	**	0.048
	3	483	-0.0069				-0.0007		0.827
	4	384	-0.0076						

Table IV
Abnormal Returns at Key Dates for Passage of Legislation

Abnormal returns are calculated using the four factor model as specified by Fama and French (1993) and Carhart (1997). Market-to-book quartiles for Panel A are calculated by ranking the market-to-book ratios and grouping the firms within quartiles, using the market value as of November 30, 1995. Scaled market-to-book quartiles for Panel C are calculated by finding the monthly average M/B for each firm from 1990-1994 and scaling the market to book on the announcement date by each firm's average MB. The scaled MB are then sorted and grouped into quartiles. In order to estimate the Fama-French Carhart factor loadings, we used daily returns from May, 1995 until October, 1995 to estimate loading factors. The (-1,1) event window results are shown, although other event windows had quantitatively similar results. Mean 4-x is the mean difference between the 4th quartile and the respective quartile. The t-test column shows the p-value for a t-test of difference of means between the 4th quartile and the respective quartile. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Panel A:

Event Date	M/B Quartile	Mean	p	Mean 4-x	t-test
12/6/1995	1	0.0018	0.330	-0.0105 ***	0.000
	2	-0.0025	0.213	-0.0062 **	0.043
	3	-0.0014	0.475	-0.0074 **	0.013
	4	-0.0087 ***	0.000		
12/19/1995	1	-0.0016	0.326	0.0031	0.247
	2	0.0033 *	0.057	-0.0018	0.517
	3	0.0016	0.406	0.0000	0.992
	4	0.0015	0.477		
12/22/1995	1	0.0004	0.842	-0.0034	0.233
	2	0.0016	0.436	-0.0046	0.123
	3	-0.0043 **	0.019	0.0013	0.655
	4	-0.0030	0.165		

Panel B:

Event Date	Scaled Quartile	Mean	p	Mean 4-x	t-test
12/6/1995	1	-0.0045 *	0.063	0.0047	0.134
	2	-0.0031 *	0.093	0.0034	0.223
	3	-0.0035 **	0.046	0.0037	0.167
	4	0.0002	0.913		
12/19/1995	1	-0.0030	0.150	0.0049 *	0.096
	2	0.0038 **	0.022	-0.0019	0.464
	3	0.0021	0.194	-0.0002	0.936
	4	0.0019	0.364		
12/22/1995	1	-0.0010	0.677	-0.0012	0.699
	2	-0.0011	0.572	-0.0011	0.694
	3	-0.0012	0.482	-0.0010	0.711
	4	-0.0021	0.278		

Table V

Analysis of High, Scaled Market to Book on Abnormal Returns at Introduction of PSLRA

Cross sectional regression of abnormal returns calculated using the Fama and French (1993) and Carhart (1997) four-factor specification, against the value of scaled market to book ratio. Scaled market-to-book ratios are calculated by finding the monthly average M/B for each firm from 1990-1994 and scaling the market to book on the announcement date by each firm's average market to book ratio. Control variables includes the Gompers, Ishii and Metrick (2003) governance index (GIM), the number of analysts (# Analysts), as well as indicators for those industries previously identified in other studies to have had significantly different reactions at the announcement of the PSLRA. p-values are in parenthesis. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Model:	1	2	3	4	5
Intercept	0.0018**	0.0136**	0.0068	0.0098**	0.0083
	(.024)	(.045)	(.199)	(.047)	(.239)
Scaled M/B	-0.0107**	-0.0105**	-0.0102**	-0.0135***	-0.0130***
	(.017)	(.019)	(.022)	(.003)	(.004)
GIM		-0.0003			-0.0002
		(.559)			(.676)
# Estimates			0.0003*		0.0003
			(.100)		(.116)
Industries:					
Healthcare				0.0076	0.0061
				(.212)	(.324)
Services				0.0134**	0.0133**
				(.026)	(.027)
Electronics				0.0210***	0.0205***
				(.000)	(.000)
Retail				-0.0011	-0.0020
				(.860)	(.739)

Table VI

Analysis of High, Scaled Market to Book Quartile on Abnormal Returns at Introduction of PSLRA

Cross sectional regression of abnormal returns calculated using the Fama and French (1993) and Carhart (1997) four-factor specification, against an indicator variable that equals one for those firms in the highest scaled, market to book quartile. Control variables includes the Gompers, Ishii and Metrick (2003) governance index (GIM), the number of analysts (# Analysts), as well as indicators for those industries previously identified in other studies to have had significantly different reactions at the announcement of the PSLRA. p-values are in parenthesis. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Model:	1	2	3	4	5
Intercept	0.0017	0.0053	-0.0019	-0.0015	-0.0019
	(.362)	(.332)	(.504)	(.484)	(.738)
Scaled M/B Dummy	-0.006*	-0.0059*	-0.0056	-0.0077**	-0.0074**
	(.085)	(.090)	(.106)	(.027)	(.035)
GIM		-0.0004			-0.0003
		(.487)			(.568)
# Estimates			0.0003*		0.0003
			(.094)		(.103)
Industries:					
Healthcare				0.0073	0.0057
				(.236)	(.358)
Services				0.0132**	0.0131**
				(.029)	(.030)
Electronics				0.0202***	0.0197***
				(.000)	(.000)
Retail				-0.0005	-0.0016
				(.933)	(.794)

Table VII

Cross-sectional Analysis of Scaled Market to Book on Abnormal Returns around Final Passage of PSLRA

Cross sectional regression of abnormal returns calculated using the Fama and French (1993) and Carhart (1997) four-factor specification, against the scaled market to book ratio for each firm. Scaled market-to-book ratios are calculated by finding the monthly average M/B for each firm from 1990-1994 and scaling the market to book on the announcement date by each firm's average market to book ratio. The market to book ratio is calculated based on the price as of November 30, 1995. Control variables includes the Gompers, Ishii and Metrick (2003) governance index (GIM), the number of analysts (# Analysts), as well as indicators for those industries previously identified in other studies to have had significantly different reactions at the announcement of the PSLRA. p-values are in parenthesis. *,**, and *** represent 10%, 5% and 1% significance, respectively.

	Event Dates		
	12/6/1995	12/19/1995	12/22/1995
Intercept	-0.0008	0.0043	-0.00002
	(.876)	(.478)	(.998)
Scaled M/B	-0.0087***	0.0048**	-0.0032
	(.000)	(.047)	(.129)
GIM	0.0014***	-0.0014***	0.0001
	(.005)	(.009)	(.821)
# Estimates	0.000014	0.0005***	-0.000006
	(.931)	(.004)	(.966)
Industries			
Healthcare	0.0072	-0.0187***	0.0163***
	(.193)	(.002)	(.003)
Services	-0.014***	0.0064	-0.0042
	(.008)	(.272)	(.410)
Electronics	-0.0171***	0.0239***	0.0028
	(.000)	(.000)	(.537)
Retail	-0.0046	-0.0114*	-0.0057
	(.397)	(.060)	(.281)

Table VIII

Analysis of Marginal Impact of Governance on Abnormal Returns for Scaled Market to Book Quartiles

Cross sectional regression of abnormal returns calculated using the Fama and French (1993) and Carhart (1997) four-factor specification, on portfolios sorted based on scaled market to book values of the firms. Control variables includes the Gompers, Ishii and Metrick (2003) governance index (GIM), the number of analysts (# Analysts), as well as indicators for those industries previously identified in other studies to have had significantly different reactions at the announcement of the PSLRA. p-values are in parenthesis. *,**, and *** represent 10%, 5% and 1% significance, respectively.

Quartile	1	2	3	4
Intercept	0.0093	-0.0088	-0.0087	0.0060
	(0.631)	(0.354)	(0.377)	(0.572)
GIM	0.0007	0.0007	0.0001	-0.0018*
	(0.717)	(0.469)	(0.910)	(0.068)
# Estimates	-0.0005	0.0001	0.0003	0.0008**
	(0.495)	(0.788)	(0.405)	(0.019)
Industries:				
Healthcare	0.0037	0.0197*	-0.0054	-0.0015
	(0.820)	(0.079)	(0.619)	(0.915)
Services	0.0339*	-0.0094	0.0108	0.0079
	(0.095)	(0.484)	(0.257)	(0.423)
Electronics	-0.0078	-0.0101	-0.0041	-0.0091
	(0.652)	(0.262)	(0.549)	(0.130)
Retail	0.0462*	0.0113	0.0199**	0.0131*
	(0.072)	(0.281)	(0.020)	(0.066)