Is CEO Certification of Earnings Numbers Value-Relevant?*

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Abstract

On June 27, 2002, the Securities and Exchange Commission of the United States ordered the CEOs and CFOs of 688 large firms to certify the earnings numbers of their companies by 5:30PM EST, Aug 14, 2002. This paper uses this natural experiment to find that certification was not only a non-event for the certifiers around their certification date, but it was *also* a non-event for the non-certifiers around Aug 15, 2002. Further tests make us conclude that CEO's certification of earnings numbers is not value-relevant.

IS CEO CERTIFICATION OF EARNINGS NUMBERS VALUE-RELEVANT?

I, [Name of principal executive officer or principal financial officer], state and attest that:
(1) To the best of my knowledge, based upon a review of the covered reports of [company name], and, except as corrected or supplemented in a subsequent covered report:
• no covered report contained an untrue statement of a material fact as of the end of the period covered by such report (or in the case of a report on Form 8-K or definitive proxy materials, as of the date on which it was filed); and
• no covered report omitted to state a material fact necessary to make the statements in the covered report, in light of the circumstances under which they were made, not misleading as of the end of the period covered by such report (or in the case of a report on Form 8-K or definitive proxy materials, as of the date on which it was filed).

[Signature]*	*Subscribed and sworn to*
[Name]	*before me this ____ day of _____2002*
[Date]	*/s/_____*
	Notary Public:
	My Commission Expires:

Excerpt from Exhibit A, File No. 4-460 (order requiring the filing of sworn statements) of the Securities and Exchange Commission, U.S.A., June 27, 2002

On June 27, 2002, the Securities and Exchange Commission (SEC) of the United States ordered the CEOs and CFOs of all firms with sales greater than USD 1.2 billion to sign the above statement (Exhibit A). Of these, 688 firms, those with financial years coinciding with the calendar year, had to sign by 5:30PM EST, Aug 14, 2002. The other 252 firms had to certify when they filed their 10K reports.

The purpose of this paper is to use this natural experiment to explore whether CEO certification of earnings numbers is regarded by the market as a significant addition to the arsenal of good corporate governance mechanisms and, hence, priced, or CEO certification is not considered value-relevant.

This is what we find. Returns, volatility of returns, or volume of trade for certifiers (non-certifiers) around their certification dates (August 15, 2002) are not unusual. This could be because certification is value-irrelevant or because certification is value-relevant but was anticipated. The paper presents evidence that does not support the latter hypothesis. So it seems that CEO certification is not value-relevant.

Our research question – is mandatory CEO certification of earnings numbers value-relevant – is an important question, because regulators think the answer is yes, and so they believe that it is an effective new mechanism to foster good corporate governance. We quote directly the reason the SEC gave for this particular order: "In light of recent reports of accounting irregularities at public companies, including some large and seemingly well-regarded companies, the purpose of the Commission's investigation is to provide greater assurance to the Commission and to investors that persons have not violated, or are not currently violating, the provisions of the federal securities laws governing corporate issuers' financial reporting and

accounting practices, and to aid the Commission in assessing whether it is necessary or appropriate in the public interest or for the protection of investors for the Commission to adopt or amend rules and regulations governing corporate issuers' reporting and accounting practices and/or for the Commission to recommend legislation to Congress concerning these matters." On July 30, 2002, the Sarbanes-Oxley Act came into effect, and item (a) under Section 302 (Corporate Responsibility for Financial Reports) under Title III (Corporate Responsibility) of this Act required the SEC, within 30 days, to make CEO and CFO certification of their earnings numbers *mandatory for all listed firms*. The SEC complied by issuing a final rule on August 29, 2002. The Sarbanes-Oxley Act of 2002 also added teeth to this regulation. In item (a) under Section 906 (Corporate Responsibility for Financial Reports) under Title IX (White-Collar Crime Penalty Enhancements), the penalty for wilfully certifying false earnings reports was set at a maximum of USD 5 million or a maximum imprisonment of 20 years or both.

The null hypothesis of this paper is that this particular SEC order requiring CEOs and CFOs to certify their earnings numbers is not relevant to firm value. Why would swearing make any difference, considering that CEOs had always previously signed their financial statements knowing that lying constituted fraud? [1] The alternate hypothesis of this paper is that this particular SEC order is an important addition to the arsenal of corporate governance mechanisms because it makes CEO certification of earnings numbers a credible signal of good corporate governance. Certification of earnings numbers is now a credible signal because the SEC order not only raised the costs of lying, but it also increased the probability of conviction by reducing the burden of proof.

Our event-study methodology, after controlling for clustering, reveals that there is nothing unusual about returns, volatility of returns and volume of trade of certifiers around their certification date. Interestingly, we find that there is nothing unusual about returns, volatility of returns, or volume of trade *even* for non-certifiers around August 15, 2002. We also use a non-parametric test – the Corrado (1989) mean rank test – to confirm our findings from our above parametric tests. We conclude that certification of earnings numbers, or the lack thereof, is a non-event. This is the first part of our paper.

The second part of the paper investigates why CEO certification of earnings is a non-event. If there is nothing unusual in returns, volatility of returns, or volume of trade during an event, this does not

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[1] A CNN QuickVote on the question "Will requiring CEOs to swear their companies' annual reports are accurate boost your confidence in corporate America" attracted 116,489 responses by 2:34 PM EST on August 14, 2002. Sixty six percent said no.

necessarily mean that the event is value-irrelevant. It could be that this value-relevant event was anticipated.

Our paper finds strong evidence that the event was anticipated by the market. A probit test of the predictability of who would or would not certify reveals strong predictability. Some variables that come out to be significant in predicting who would or would not certify are the following. Firms who did not certify are likely to be firms who restated their earnings in the past one year, are in distress (low free cash flow, low cash), have more agency problems (lower institutional shareholdings), and were audited by Arthur Andersen.

However, if the event is value-relevant but was anticipated, there are four testable implications. First, we should see positive (negative) abnormal returns of firms that were expected not to certify, but did (expected to certify, but did not). We do not find any such abnormal returns. Second, the little news that does come out on the event date – as measured by abnormal returns (AR) – should have predictable correlations with certain firm-specific corporate governance variables. For example, if it is anticipated that only firms with good corporate governance are expected to certify, then we should expect that measures of good corporate governance – like percentage of outside directors in the board – should be able to explain AR. We find very low explanatory power on June 27, 2002 (the day the firms were ordered to certify) or on July 25, 2002 (the day Congress passed the Sarbanes Oxley Act) or on the certification date. Third, values should be affected the day certification is actually anticipated. We find that a portfolio consisting of certifiers and a portfolio consists of non-certifiers on December 3, 2001 (the day after Enron filed for bankruptcy) have similar returns till January 2002, and after that month, the certifier portfolio beats the non-certifier portfolio. The market could not have possibly anticipated CEO certification as early as January 2002. The earliest mention of CEO certification in the media was June 6, 2002, when a committee in the New York Stock Exchange recommended CEO certification for all listed companies. It is our view that the market had become very sensitive to earnings management after the collapse of Enron, Worldcom, etc., and had started to separate firms with good earnings transparency from firms with bad earnings transparency from January 2002. This separation seemed to be complete by May 2002, which is much before the day the SEC order was first discussed in the media (June 6, 2002) or the SEC order was given (June 27, 2002). Therefore, on June 6, 2002, or on subsequent dates after that, there was *no further change in the difference* between the valuation of the certifiers and the non-certifiers. Fourth, even if who would or would not certify is predictable, the market index should react positively when the news about the new regulation becomes public, if the new regulation is beneficial. We do not see a positive abnormal return of the market on June 6, 2002 or June 27,

2002. The results of these four additional tests all suggest that CEOs certification of earnings numbers is not value-relevant.[2]

The rest of the paper is structured as follows. Section I describes our data. In section II we document the impact on trading behavior, or the lack thereof, of certification of earnings numbers. Some econometric issues are discussed here, as well as how we tackled these issues using three different methodologies. Section III explores why we find certification to be a non-event in the previous section. Section IV concludes.

I. Data and Descriptive Statistics

A. Data and their Sources

There were 940 firms listed in the SEC order 4-440, companies whose revenues were greater than USD 1.2 billion in the last fiscal year, companies whose CEOs and CFOs had to certify their earnings numbers. Of these 940 companies, the CEOs and CFOs of 688 firms had to certify their earnings numbers by 5:30PM, August 14, 2002. Our sample consists of the 688 firms that had to certify by that date plus the 74 firms that did not have to certify by that date but did, bringing the total sample size to 762 firms.

The Appendix gives details on the data that we collected for our sample. It also gives the sources for these data. The financial data that we collected are the following: a variable related to the industry (industry SIC code), variables related to size (sales, market capitalization and total assets), variables related to leverage (debt to equity ratio and debt to total assets ratio), a variable related to liquidity (cash), a variable related to the intangibility of assets (R&D expense), variables related to payout to equity holders (dividends and share repurchases), variables related to valuation (market to book ratio), variables related to profitability (return on equity and return on assets) and a variable related to liquidity (free cash flow). Unless otherwise specified, these data are for the fiscal year that ended in 2001. We also obtain the following trading data for each firm in our sample from the period Jan 1, 1996 through August 20, 2002: daily dividend-adjusted and stock-split adjusted return, and daily volume. We also obtained returns of the daily Value Line equally-weighted market

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[2] Li, Pincus and Rego (2004), in a study of all the events surrounding the Sarbanes-Oxley Act of 2002, find the *cumulative effect* of events on stock prices in the period January 17, 2002 to July 16, 2002 (July 24, 2002 to September 2, 2002) to be insignificant (positive). They also find that in the cross-section, the abnormal returns are positively associated with earnings management and negatively associated with the proportion of non-independent audit committees and the extent of non-audit services performed by external auditors. Jain and Rezaee (2005), in a study of all the events surrounding the Sarbanes-Oxley Act of 2002, find only July 25, 2002 and July 30, 2002 to have positive abnormal returns. Our paper differs from the above papers is that we focus not on the entire Sarbanes-Oxley Act of 2002, but on just one single provision: CEO certification. It could be argued that we do not find any abnormal positive returns because CEO certification is subsumed in the whole Act. Our counter-argument is given the text above: if true, we should see positive (negative) abnormal returns of firms that were expected not to certify, but did (expected to certify, but did not), and we do not find any such abnormal returns. Moreover, certifiers and non-certifiers separate in value on January 2002, and this is too early for the market to have anticipated that regulators will order certification.

index.[3] We obtain these trading data to compute abnormal returns around the event date.

We obtain the following corporate governance data for our sample – the number of directors in the board, the fraction of the directors that are insiders, and whether the CEO and the chairperson is the same person – and we obtain the following data about ownership for our sample – number of shareholders, proportion of shares held by management, proportion of shares held by institutions, and proportion of shares held by shareholders whose individual holdings are 5% or more. We obtain the following additional data for our sample – the dollar value of stocks underlying options granted to management as a proportion of total market capitalization, the number of research firms who follow this company, whether the company restated its earnings in 2002, and whether Arthur Andersen was an auditor of this company. Unless otherwise specified, these data are for the fiscal year ending 2001. Some of these data are missing for 20 firms. So our final sample size is 742 firms.

*B. Descriptive statistic*s

Of the 688 firms required to certify their earnings by Aug 14, 2002, we find that 664 (96.5%) certified by filing Exhibit A, an excerpt from which was given in the first page. 15 firms filed their own versions of certification, whereas 9 failed to file anything. Of the 664 firms who certified, 33 firms (5%) restated their earnings in the last one year. Of the 24 firms who did not certify or certified in some other form, 3 firms (12.5%) restated their earnings in the last one year. Of the 252 firms required to certify their earnings, but not by Aug 14, 2002, 74 firms (29.4%) certified by filing Exhibit A on or before that day. None of these 74 firms, as far as our search revealed, had restated their earnings. Henceforth, unless otherwise mentioned, we define as "certifiers" all firms who certified on or before Aug 14, 2002, whether they had to or not. So the sample size of certifiers is 720 (664 plus 74 minus 18 for which we do not have all data). "Non-certifiers" would be all firms who had to certify by August 14, 2002, but did not (they filed their own versions of certification, or failed to file anything). So the sample size of non-certifiers is 22 (9 plus 15 minus 2 for which we do not have all data).

Column 1 and Column 2 in Table I compares the certifiers with the non-certifiers. The only significant difference between certifiers and non-certifiers is that non-certifiers have a significantly lower

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[3] Because we have the largest U.S. firms in our sample, we attempt to minimize their dominance by choosing an equally-weighted index instead of a value-weighted index. We choose the Value Line equally-weighted index because that was the only index available to us when we first wrote this paper in September 2002. None of our results are overturned when we ran our tests again using the CRSP equally-weighted index or the CRSP value-weighted index. As a matter of fact, as we suspected, the use of the CRSP value-weighted index makes our results stronger (i.e, the event becomes "more of a non-event.")

institutional shareholding than certifiers have. Non-certifiers also have a significantly lower market-to-book ratio than certifiers have.

Column 3 in Table I gives the statistics for the entire market, where the market is defined as all firms in Compustat as of December 31, 2001 for which data was available to compute the ratios in the table. Comparing Column 3 with the other columns in Table I tells us that the firms in our sample are large firms; firms in our sample have significantly higher sales, market capitalization and total assets than the typical Compustat firm.

Figure 1 displays certification across calendar time. It is obvious from this figure that an overwhelming majority of CEOs waited till the very end to certify. Of the 664 certifiers, the CEOs of 230 firms (35%) certified their earnings numbers on the last day, and the CEOs of 194 firms (29%) certified their earnings numbers on the penultimate date. As a matter of fact, the CEOs of 654 firms (98%) certified their earnings numbers in the last week. We do not know the reason for this, but we suspect the reason is that the reputational benefits of early certification were outweighed by the costs of hasty certification for most firms.

The clustering of certification dates poses some challenges to the conventional method of doing event studies. We discuss these econometric issues and their resolution in the next section.

II. The Impact of CEO Certification of Earnings Numbers

A. Returns

Figure 2 shows cumulative abnormal return (CAR) in event time for both certifiers as well as non-certifiers. These abnormal returns are calculated using the market model. [4] The estimation period is 217 days before the event to 97 days before the event. As is standard, the event is labeled as the date 0. The event is the certification date for the certifiers, and is August 15, 2002 for the non-certifiers. We follow the CAR from 75 days before the event to 10 days after the event. Notice that the CAR does not jump up for the certifiers around their date of certification, and the CAR does not jump down for the non-certifiers around their date of non-certification (taken to be August 15, 2002, the date non-certification became common knowledge). The CAR of the non-certifiers, on the contrary, seems to be jumping up! These findings of a non-event are

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[4] Abnormal returns in this paper are estimated using two models: the market model and the means-adjusted model. In the text, we report results using the market model when the tests are in event-time, and we report results using the means-adjusted model when the tests are in calendar-time. The reason for the former is that the result from a market model is what the literature usually reports, whereas the reason for the latter is that the market model is a poor test when the entire market reacts on a calendar date. Nevertheless, since we use both methods, we make it clear which method we are using, and report discrepancies in the result obtained by using the other method, if any.

confirmed using the alternate means-adjusted model, as well as in formal tests in Tables II, III and IV.

In typical event studies, it is assumed that the abnormal returns on individual securities are uncorrelated in the cross-section, an assumption which is reasonable considering that event windows of the securities do not usually overlap. This is not true in our study. As can be seen in Figure 1, there is severe clustering of events, and so it is expected that abnormal returns on individual securities are correlated. Campbell, Lo and MacKinlay (1997) suggest two completely different approaches to deal with this econometric issue. We employ both of their suggestions.

A1. Parametric test - The Portfolio Method

The first method to handle clustering is the portfolio method. This method creates a portfolio of all stocks who share the same event date. After forming these portfolios, a security level analysis can be performed on the portfolio as a whole, which diminishes the error created by cross correlation in the error terms. To obtain a reasonable sample size, we created portfolios based around any date on which more than twenty certifications occurred. This occurred for six trading days: August 7, 8, 9, 12, 13 and 14. For those firms that did not certify with Exhibit A, the event date was assumed to be August 15th for our tests. The estimation period began 142 trading days prior to the certification, and lasted for 120 trading days.

The results are in Table II. The abnormal returns are means-adjusted returns for June 6, June 27 and July 25. This means that we subtract each stock's mean return during the estimation period from the actual calendar date return for that company. This means-adjusted returns methodology is necessary for two reasons. First, because this particular sample is made up of the largest public companies, the market returns may be highly affected by the returns on the stocks in the sample. Second, because all firms would eventually be subject to Sarbanes-Oxley, the entire sample may have reacted to the events on these calendar dates. In either case, the abnormal returns calculated using the market model may be biased downward. The abnormal returns for the other days are estimated using the market model. We notice that on the day the first mention of certification appeared in the press – June 6, 2002 – the returns of firms were not abnormal. We notice that on the day the SEC ordered the firms to certify – June 27, 2002 – the returns of firms were not abnormal. We notice that on the day the Sarbanes-Oxley Act was passed by Congress – July 25, 2002 – the returns of firms were slightly abnormal (10% significance). This could be because other elements in the Sarbanes-Oxley Act may have been value-relevant, as also pointed out by Jain and Rezaee (2005). Returns were not abnormal for the non-certifiers on August 15, 2002, the day after the deadline when it became common

knowledge who had not certified.[5] Returns were not abnormal for the certifiers on their day of certification. As certifications or non-certifications were sometimes announced a day later, we repeated all our tests by expanding our event window by one more day. None of our results change. Our results of a non-event become stronger if we use the market model to compute abnormal returns for June 6, June 27 and July 25; and only August 14 becomes abnormal for certifiers if we use the means-adjusted model to compute abnormal returns on the other days. The last column in Table II, though not a formal test, does confirm our finding that there is nothing unusual in returns in the event date – the number of stocks beating the market are not significantly different than the number of stocks being beaten by the market.

A2. Parametric test - Seemingly Unrelated Regressions (SUR)

The second method to handle clustering is to use seemingly unrelated regressions (SUR). The basic approach is to run a multivariate regression model, where the dependent variable is the security's daily return and the independent variables are the market's daily return and dummy variables for the event dates. However, as the market itself may be reacting on the event day of a regulation, we used a means-adjusted security's daily return as the dependent variable. An F-test is used to check whether the average stock's return on the event period is abnormal (see Schipper and Thompson (1983, 1985), Malatesta and Thompson (1985), and Collins and Dent (1984)).

We test four hypotheses about the coefficients from the seemingly unrelated regression system:

$$(r_{jt} - r_{j,mean}) = \alpha_j + \beta_{0j}\, r_{mt} + \beta_{1j}\, D_{1t} + \beta_{2j}\, D_{2t} + \beta_{3j}\, D_{3t} + \beta_{4j}\, D_{4jt} + e_{jt} \tag{1}$$

where

$r_{jt} - r_{j,mean}$ is the difference between the day t return of security j and the mean return of security j over an estimation period;

e_{jt} is the day t error term of security j;

D_{1t} is a dummy variable that equals one when day t is June 6, and is zero otherwise;

D_{2t} is a dummy variable that equals one when day t is June 27 or June 28, and is zero otherwise;

D_{3t} is a dummy variable that equals one when day t is July 25 or July 26, and is zero otherwise;

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[5] It is true that we have a small sample size and, hence, low power. However, if all 22 non-certifiers have negative abnormal returns on the event date, the chances of this happening – assuming an equal likelihood of negative abnormal returns and positive abnormal returns – is $(0.5)^{22}$, which is very small. As a matter of fact, to get a p-value of 5%, we need only 16 or more to have a negative abnormal return. What do we find? Only 12 (7) of the 22 non-certifiers have negative abnormal returns if abnormal returns is computed using the market model (means-adjusted model). So we cannot reject the null hypothesis that the returns of the non-certifiers on August 15 are typical.

D_{4jt} is a dummy variable that, for certifiers, equals one on day t and day t+1 (where t is the day company j certified), and zero otherwise; and, for non-certifiers, equals one when day t is August 14 or August 15, and zero otherwise.[6]

Our first null hypothesis is that June 6 does not have abnormal returns (the sum of the β_{1j} coefficients equals zero). Our second null hypothesis is that June 27 or June 28 does not have abnormal returns (the sum of the β_{2j} coefficients equals zero). Our third null hypothesis is that July 25 or July 26 does not have abnormal returns (the sum of the β_{3j} coefficients equals zero). Our fourth null hypothesis is that certification or non-certification dates do not have abnormal returns (the sum of the β_{4j} coefficients equals zero). In other words, our four null hypotheses are that neither the day the possible ordering of CEOs to certify their earnings first appeared in the press (June 6), nor the day the SEC ordered CEOs to certify their earnings (June 27), nor the day the Sarbanes-Oxley Act cleared Congress (July 25), nor the day CEOs certified or not certified, are unusual return days.

We test these four hypotheses by calculating F statistics of the full and constrained models. We perform these tests three times. First, firms that have certified are randomly assigned to four sub-samples. The reason for using four sub-samples, each having approximately 180 companies (720 in total) is that the F test requires that each firm has to have at least 1445 observations.[7] Some firms do not have that many observations. Second, we test the hypotheses on the largest sample of companies (that certified by August 14) that have a sufficient number of observations. The sample size is 638 companies with more than 1277 observations. Third, we test the hypotheses on a sample of companies that did not certify (we have data for 22 companies) by August 14, 2002, but were required to.

Table III, Panel A, gives the results. The F-statistics in Column 1, which is a test of H1, are not significant anywhere. This implies that, on an average, returns were not abnormal on June 6, 2002 (the day reports of possible ordering of CEOs to certify their earnings first appeared in the press). The F-statistics in

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[6] The SUR (seemingly unrelated regression) method assumes that all the regressors are independent variables, but uses the correlation among the errors in different equations to improve the regression estimates. The error terms are assumed to be serially independent, but they are allowed to be cross-sectionally dependent. SUR, therefore, allows for interdependence among the firms. The SUR method requires an initial OLS regression to compute residuals; the OLS residuals are then used to estimate the cross-equation covariance matrix. The model used in the SUR here is balanced.

[7] If J is the number of firms, we need 2(J+1) observations per firm. This is the reason why. The inverted covariance matrix follows a Wishart distribution, which has an undefined first moment, which means that the estimated mean will be unstable if we do not have enough observations. Having 2(J+1) observations per firm achieves stability (see Schipper and Thompson (1983)).

Column 2, which is a test of H2, are not significant anywhere. This implies that, on an average, returns were not abnormal on June 27, 2002 (the day of the SEC order). The F-statistics in Column 3, which is a test of H3, are not significant anywhere. This implies that, on an average, returns were not abnormal on July 25, 2002 (the day the Sarbanes-Oxley Act cleared Congress). The F-statistics in Column 4, which is a test of H4, are not significant anywhere. This implies that, on an average, returns were not abnormal on the date of certification for the certifiers, and returns were not abnormal for the non-certifiers at the time non-certification became common knowledge (August 14 and 15, 2002). We repeated the above SUR with just the daily return as the dependent variable, and the market return as an extra independent variable. Returns still remain normal in all four days.

A similar SUR was estimated for both volume and volatility. The independent variables are the same as above. The dependent variable for volume was ($volume_{jt}$ / $volume_{j,mean}$). It is the ratio of the daily volume for stock j over the average daily volume for that security in the estimation period. The dependent variable for volatility was ($volatility_{jt}$ / $volatility_{j,mean}$). It is the ratio of the absolute value of the daily return for stock j over the average absolute daily return in the estimation period.

Table III, Panel B, gives the results for volume. Of the 24 tests, we get abnormal volume at a 10% significance for only 2 tests (June 6, 2002 for the largest sample of certifiers, and July 25, 2002 for one sub-sample of certifiers). Table III, Panel C, gives the results for volatility. Of the 24 tests, we get abnormal volatility at a 10% significance for only 2 tests (certification date (non-certification date, August 15, 2002) for the largest sample of certifiers (non-certifiers) and one sub-sample of certifiers(non-certifiers)).

A3. Non-Parametric test

We use a non-parametric test proposed in Corrado (1989). This test does not make any distributional assumptions, focusing instead on the rank of the observations instead of their values. Corrado (1989) shows that this test statistic is well-specified, and is expected to be asymptotically normally distributed.

Table IV presents the results for the Corrado (1989) test. Panel A presents the results for event time, whereas Panel B presents the results for calendar time. Panel A confirms our findings from our previous parametric tests: there is nothing unusual in returns, volatility of returns, or volume of trade on the date of certification for the certifiers, and at the time non-certification became common knowledge (August 15, 2002) for the non-certifiers. In Panel B, we check to find if there is anything unusual in returns, volatility of returns, or volume of trade on June 6, 2002 (the day the press first discussed a possible order asking CEOs to certify

their earnings) or around June 27, 2002 (the day the SEC order was passed) or during July 25, 2002 (the day the Congress passed the Sarbanes-Oxley Act, and it was widely known that the president would sign it) or during August 14, 2002 (the date of the deadline). With a few exceptions, our answer is generally the same for all three days – nothing unusual happens to certifiers, non-certifiers, or the whole market in returns, volatility of returns, or volume of trade in these three days.[8]

B. Volatility

Figure 3 shows normalized daily volatility in event time for both certifiers as well as non-certifiers. We normalize daily volatility using two steps. First, an individual share's absolute return in a particular day is divided by its average daily absolute return, where the average is taken over 75 days before the event to 10 days after the event. Second, this normalized daily volatility for each share is averaged across all shares for each day in event time. Figure 3 plots this daily normalized volatility from day -75 to day +10. The plot hovers around 1, because the average normalized daily volatility over this time period is 1 by construction. If CEO certification or non-certification of earnings numbers affects volatility of returns, we would expect to see a big spike around the event date (day 0) in Figure 3. As can be seen, there is no such spike in the event window for either the certifiers or the non-certifiers.

C. Volume

An analysis of volume in event time yields similar results – no event – as the above analysis on volatility in event time.

IV. Why was there no impact?

A possible reason why CEO certification or non-certification of earnings numbers had no impact is because there was no surprise. The CEOs were ordered by the SEC to certify their earnings numbers and were expected to certify their earnings numbers. So the market was not surprised when they did certify. As for the firms that did not certify, as many of these firms were well-known "scandal" firms (like Enron and WorldCom), they were not expected to certify. They did not, and the market was not surprised that they did not. In other words, who would certify and who would not certify was predictable.

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[8] Returns were unusually high for everyone (certifiers, non-certifiers, and the market) only on August 14, 2002, the last date for certification for 688 firms. As it was high for non-certifiers as well, it is difficult to interpret this as good news for certifiers and bad news for non-certifiers. A more likely interpretation is the resolution of uncertainty on August 14, 2002, which is evidenced by the fact that volatility was unusually high for the market on Aug 14, 2002. Finally, volume was unusually high for certifiers and non-certifiers on July 25, 2002, the day the Sarbanes-Oxley Act was passed, which probably suggests differences of opinion on the efficacy of this Act. As the goal of this paper is modestly restricted to examining the value-relevance of CEO certification of earnings numbers, an ambitious attempt to examine the overall effect of the Sarbanes-Oxley Act on value, uncertainty, or difference of opinion is beyond the scope of this paper.

We do find strong evidence of predictability. We run a Probit test where the dependent variable is 1 for the certifiers and 0 for the non-certifiers. The independent variables are firm-specific variables related to the industry, size, leverage, liquidity, intangibility of assets, payout to equity holders, valuation multiples, and profitability. Other independent variables that we use are related to two key internal corporate governance mechanisms – composition of the board of directors (the number of directors in the board, the fraction of the directors that are insiders, and whether the CEO and the chairperson is the same person) and composition of firm ownership (number of shareholders, proportion of shares held by management, proportion of shares held by institutions, and proportion of shares held by shareholders whose individual holdings are 5% or more).[9] Our other independent variables are related to CEO compensation, visibility of the firm, past restatement of earnings, and the quality of its auditor.[10]

The results of the Probit test are given in Table V. We find that the probability of a CEO certifying the earnings numbers is positively linked to the firm's liquidity (where liquidity is measured as cash or free cash flow), and is positively linked to tangibility of assets (R&D expenses are negatively linked). Though board composition of the firm seems not to affect the choice to certify or not, the ownership composition does. Firms with more institutional shareholders and more shareholders are likely to certify. An interesting fact in this table is that firms which have restated their earnings in 2002, or firms that were audited by Arthur Andersen, are found to be less likely to certify. Recall from Table I that 41% of the firms who did not certify had restated their earnings in 2002, and that Arthur Andersen audited 50% of the firms who did not certify.

We need to make two points about our probit test. First, as we use 22 independent variables, multi-collinearity may be a problem. We document that it is not. We estimate a Variance Inflation Factor (VIF) for detecting multi-collinearity. The VHF is less than the critical level of 20. Second, according to Green (1997, page 875), since different distributional assumptions underlie the probit and the logit models, it would be useful to test both these models, especially if there is extreme skewness in 1's and 0's, as exists here. As a robustness check, we ran a logit model using the same independent variables. The findings as well as the

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[9] Denis and McConnell (2003), in a comprehensive survey of corporate governance around the world, point out that the board of directors and ownership structure are the two key internal corporate governance mechanisms. According to them, the three board characteristics mentioned above, as well as the four ownership characteristics mentioned above, have been the most investigated in the literature. Hermalin and Weisbach (2002) review the US evidence on boards, whereas Holderness (2002) surveys the US evidence on ownership.

[10] Option grants to managers may (the classical view) or may not (see, for example, Yermack (1997)) align the interests of managers to that of shareholders. A firm with a large analyst following is likely to have more earnings transparency and, thus, the likelihood of certification of earnings numbers should be higher. The CEO of a firm which has restated its earnings may find it easier to certify the earnings numbers. Arthur Andersen, being the auditor of Enron and WorldCom, and now criminally indicted, may have audited a few more firms whose earnings are difficult to certify.

high value of goodness-of-fit were similar. This shows that certification and non-certification were quite predictable.

The probit test offers us our first opportunity to test an empirical implication of the alternate hypothesis that certification is a non-event because, though certification is value-relevant, it was anticipated. The testable implication is the following. If certification or non-certification is value-relevant but was anticipated, we should see positive (negative) abnormal returns of firms that were expected not to certify, but did (expected to certify, but did not). The idea behind this test is to check whether the former was a "good news surprise" and the latter was a "bad news surprise." In other words, we use the probit model to check whether the abnormal returns of firms that "go against type" are significant. So we check the abnormal returns of firms that the probit model had predicted would certify but they actually did not – 22 in our sample – and we check the abnormal returns of firms that the probit model had predicted would not certify but they actually did – 10 in our sample. We do not find any surprises. The cumulative abnormal return in the period from day 0 to day 1 was 1.45% (t=0.555) for the former set, and 0.44% (t=0.461) for the latter set. The non-parametric Corrado test statistics are 1.656 for non-certifiers (p-value of 0.049) and 1.294 for the certifiers (p-value of 0.098) on the event date.

The second testable implication is the following. If certification or non-certification was value-relevant but predictable, the little news that does come out on the event date – as measured by abnormal returns (AR) – should have predictable correlations with certain firm-specific corporate governance variables. For example, if it is anticipated that only firms with good corporate governance are expected to certify, then we should expect that measures of good corporate governance – like percentage of outside directors in the board – should be able to explain AR. The abnormal returns (AR) are then cumulated over specified time windows (CAR). We run cross-sectional regressions of CAR of the certifiers against variables that measure corporate governance around four time periods: June 6, 2002 to June 26, 2002 (from the day the press first discussed the possibility of the ordering CEOs to certify their earnings to the day the firms were actually ordered to certify), June 27, 2002 (the day the firms were ordered by the SEC to certify), July 25, 2002 (the day Congress passed the Sarbanes Oxley Act) and the certification date. CAR is computed using the constant-mean-returns model.

The cross-sectional evidence is given in Table VI. 22 of the 23 independent variables are the same variables we had used before in Table V. The other independent variable is a dummy variable which

indicates whether a firm certified by August 15, 2002, though it did not have to. Table VI finds that the only variables that have any significant relationship with the cumulative abnormal return on some event dates are the firm's sales, return on assets, return on equity, dollar dividend, dollar repurchased stock and the percentage of institutional shareholdings. Firms with higher return on assets and larger institutional shareholdings have higher CAR. We estimate a Variance Inflation Factor (VIF) for detecting multi-collinearity in all the three tests; the VHF is less than the critical level of 20 in all three.

The most important finding of the cross-sectional tests of Table VI is the poor explanatory power of the 23 independent variables; the adjusted R^2 is not more than a paltry 3.2% for the CAR for any event window.

The third testable implication is the following. If certification or non-certification was value-relevant but predictable, values should be affected the day certification is actually anticipated. So we construct a portfolio of certifiers and a portfolio of non-certifiers on December 3, 2001 (the day after Enron filed for bankruptcy) and normalize the values of this portfolio to 100 on December 3, 2001. The value of these two portfolios as well as the value of the benchmark market portfolio is then tracked from December 3, 2001 to August 22, 2002 in Figure 4. Four dates are important in this period – June 6, 2002 (the day the press first discussed the possibility of the ordering of CEOs to certify their earnings), June 27, 2002 (the day the SEC issued its order to the CEOs of 940 large firms to certify their earnings by a deadline), July 25, 2002 (the day Congress passed the Sarbanes-Oxley Act, which made certification mandatory for all listed firms), and August 14, 2002 (the deadline for certification for the majority of large firms – 688 firms) – and these dates are marked in Figure 4.[11]

Note from Figure 4 that the certifier portfolio has similar returns as the non-certifier portfolio till January 2002, and after that month, the certifier portfolio beats the non-certifier portfolio. The market could not have possibly anticipated CEO certification as early as January 2002. The earliest mention of CEO certification in the media was June 6, 2002, when a committee in the New York Stock Exchange recommended CEO certification for all listed companies. It is our view that the market had become very sensitive to earnings management after the collapse of Enron, Worldcom, etc., and had started to separate firms with good earnings transparency from firms with bad earnings transparency from January 2002. This

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[11] It could be argued that July 30, 2002, is also an important date, because the President signed the Sarbanes-Oxley bill that day, thus making it a law. It is our contention that this was not an event because it was a foregone conclusion; the President had signaled he would sign as soon as the law passed Congress on July 25, 2002.

separation seemed to be complete by May 2002, which is much before the day of the SEC order (June 27, 2002). Therefore, on June 27, 2002, or on subsequent dates after that, there was *no further change in the difference* between the valuation of the certifiers and the non-certifiers.

Figure 4 did not control for risk. So we draw cumulative abnormal returns beginning from December 3, 2001, where the abnormal returns are computed using the Fama-French (1993) three factor model of market, size and book-to-market. This is shown in Figure 5. Notice that our conclusion from Figure 4 does not change: the market had started to separate firms with good earnings transparency from firms with bad earnings transparency from January 2002. This separation seemed to be complete by May 2002, which is much before the day of the SEC order (June 27, 2002).

Daily normalized volatility in calendar time are computed in a similar manner as was done in the case of event time. The only difference here is that the estimation period for computing the means for daily volatility is from April 1, 2002 to August 28, 2002.

Figure 6 shows normalized volatility in calendar time. In Figure 6, note that the market is more volatile than either the certifiers or the non-certifiers. This is not surprising, considering that the certifiers and the non-certifiers are the large firms. An interesting point to note in this graph is that, though there is nothing unusual in volatility of returns for certifiers, non-certifiers, or the market in any of the four days under observation (June 6, 2002, June 27, 2002, July 25, 2002 and August 14, 2002), the period between June 6, 2002 and August 14, 2002 had higher volatility of returns than the other periods. A possible explanation could be that the SEC order slowly increased uncertainty, and this uncertainty slowly decreased after the deadline of August 14, 2002 passed.

An analysis of volume in calendar time yields similar results – no event – as the above analysis on volatility in calendar time.

We next performed formal tests to confirm our above visual conclusions. Cumulative abnormal return (CAR) was computed using the Fama-French (1993) three factor model as in Figure 5. We then tested whether the difference in CAR between the certifiers and the non-certifiers changed from June 6, 2002 (the day the press first mentioned the possibility of the ordering of CEOs to certify their earnings) to August 15, 2002. There was no change (t-statistics of the trend coefficient was -0.67). Normalized volume was computed as actual volume divided by mean volume. We then tested whether the difference in normalized volume between the certifiers and the non-certifiers changed from June 6, 2002 to August 15, 2002. There

was no change (t-statistics of the trend coefficient was 0.98). Normalized volatility was computed as actual absolute return divided by mean absolute return as in Figure 6. We then tested whether the difference in normalized volatility between the certifiers and the non-certifiers changed from June 6, 2002 to August 15, 2002. There was a positive change (t-statistics of the trend coefficient was 2.62), implying that the volatility of the certifiers became more than the volatility of the non-certifiers in this period. This, however, had no effect on value relevance, as the first test showed.

The fourth, and final, testable implication is the following. Even if who would or would not certify is predictable, the market index should react positively when the news about the new regulation becomes public, if the new regulation is beneficial. Recall from Table IV that we did not see a positive abnormal return of the market on June 27, 2002.

The results of these four additional tests all suggest that CEOs certification of earnings numbers is not value-relevant.

V. Concluding Remarks

On June 27, 2002, the Securities and Exchange Commission of the United States ordered the CEOs and CFOs of 688 large firms to certify the earnings numbers of their companies by 5:30PM EST, Aug 14, 2002. The purpose of our paper is to find out whether this particular regulation helped in any way to restore investor confidence that had been battered by the recent accounting scandals of Enron, WorldCom, etc.

Our finding is a negative finding. We document that certification was not only a non-event for the certifiers around their certification date, but it was *also* a non-event for the non-certifiers around Aug 15, 2002. A reason why this could have happened is because the market had become very sensitive to accounting irregularities, and had partially distinguished between firms with good earnings transparency and firms with bad earnings transparency. We provide corroborating evidence in favor of this predictability hypothesis. However, we go on to document with cross-sectional and time-series evidence that the SEC order did not help the market's ability to differentiate *further* between these two types of firms. This leads us to conclude that CEO certification of earnings numbers was, at best, a marginally valuable addition to the arsenal of good corporate governance practices.

Appendix
Description of the Data Used

Variable	Description	Source	# of firms for which we have data	# of missing firms
Industry	Four digit SIC code at the end of 2001	Compustat	742	20
Sales	Total revenues in 2001 [data 12]	Compustat	742	20
Total Assets	Book value of total assets at the end of 2001 [data 6]	Compustat	742	20
Market Value	Shares Outstanding at end of 2001 multiplied by final price in 2001 [data 24 x data 25]			
Debt/Equity Ratio	Book value of debt [data 181] to market value of equity at the end of 2001	Compustat	742	20
Debt/Total asset	Book value of debt to book value of total assets at the end of 2001	Compustat	742	20
Cash	Total amount of cash [data 1] at the end of 2001	Compustat	742	20
R &D expense	Research and development expenses [data 46] in 2001	Compustat, SEC 10K	742	20
Dividend	Total amount of dividends [data 21] paid out in 2001 and 2002	Compustat	742	20
Repurchased Stock	Total value of repurchased shares in 2001 and 2002	SEC, 10 K	742	20
Market/Book Ratio	Market Value / Book value of total assets at the end of 2001	Compustat	742	20
ROE	Net income in 2001 / average of the 2000 and 2001 book value of equity [data 11]	Compustat	738	24
ROA	Net income [data 18] 2001 / average of the 2000 and 2001 book value of total assets	Compustat	742	20
FCF	Operating Income - increase in the net working capital - income taxes paid - capital expenditures at the end of 2001 [data 13 - data 16 - data 30 - change in data 179]	Compustat	742	20
Returns	Daily dividend adjusted returns from January 1, 1996 and August 20, 2002	Datastream	742	20
Volume	Daily volume for stocks from January 1, 1996 and August 20, 2002	Datastream	742	20
Market index	Value Line equally-weighted market index from January 1, 1996 and August 20, 2002	Yahoo finance	742	20
Size of the board	Total number of directors on the board at the end of 2001	SEC, 10K	735	27
% Insider directors	Percentage of inside directors (i.e., directors employed in the company) on the board of directors at the end of 2001	SEC, 10K	735	27
CEO is Chairman	Dummy that equals one if the board's chairperson is the company's CEO at the same time, and equals zero otherwise (the end of 2001)	SEC, 10K	735	27
# of Shareholders	Total number of shareholders of the company at the end of 2001	Disclosure Inc	738	24
% Management Shareholdings	Percentage of the firm owned by insiders at the end of 2001	Disclosure Inc	729	33
%Institutional	Percentage of the firm owned by institutions at the end of 2001	Disclosure Inc	724	38
% > Five-Percent Shareholding	Percentage of the firm owned by shareholders whose individual holdings are at least 5% (at the end of 2001)	Disclosure Inc	718	44
$ Options / Mkt.Cap.	Total value of the stocks underlying options / Market capitalization at the end of 2001	SEC, DEF 14 A	742	20
# of Research Firms covering	Number of financial research companies following a company at the end of first quarter 2002	Nelson's Public Company Profiles	728	34
Restated Earnings	Dummy that equals one if the company restated it's earnings in 2002, and zero otherwise.	LexisNexis search	742	20
Audited by Anderson	Dummy that equals one if Arthur Anderson was company's auditor in 2001 or 2002, and zero otherwise	SEC, 10K	742	20

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Table I:
Comparison of Certifiers vs. Non-Certifiers vs Market

Notes: Column one shows information for those firms who filed Exhibit A by August 14, 2002. Column two shows statistics for those firms that had to certify by August 14, 2002, but did not file a certification, or did not file the required Exhibit A by then. Column three shows the statistics for all firms covered in the Compustat database for which all necessary data was available. Columns four, five and six show the p-values from two-tailed t-tests of mean values for unequal and unpaired samples, with the hypothesis that both sample means are equal. For medians, the p-value comes from a two-sided, Mann-Whitney test. Accounting information was taken from the Compustat database for the last fiscal year. Ownership variables reflect the portion of a firm's equity held by officers of the firm or institutional shareholders. The book values of debt and market value of equity were used in the D/E ratio, while the market to book ratio was calculated by adding the market value of equity to the book value of debt, and then dividing the sum by the book value of the firm. The compensation measure is the dollar value of the shares underlying both vested and non-vested options given to each firm's top management as reported in SEC filings, divided by the market capitalization of the firm. Information on board composition comes from each firm's financial reports and include the number of directors, the percent that are also officers of the firm, and whether the CEO is also the chairman of the board. The firm's auditor was obtained from financial reports, while the restatement variable came from a Lexis-Nexis search. Free cash flow was calculated as follows: Earnings before taxes + Depreciation and Amortization - CAPEX - Income taxes - Increase in Net Working Capital. ROA and ROE are net income divided by the total book value of assets and market value of equity respectively for the 2001 fiscal year.

			Required to Certify by August 14, 2002 14					
Market Variables			(1) Certified	(2) Did not certify	(3) Market	(4) p-value (1)=(2)	(5) p-value (2)=(3)	(6) p-value (1)=(3)
Number in Sample		#	719	22	8995	-	-	-
Sales (Billions)		mean	8.58	17.63	1.760	0.093	0.005	0.000
		median	3.30	6.83	0.092	0.074	0.000	0.000
Total Assets (Billions)		mean	22.32	30.17	4.164	0.467	0.020	0.000
		median	4.25	13.39	0.174	0.108	0.000	0.000
Debt/Equity		mean	3.48	3.36	2.773	0.924	0.632	0.246
		median	1.98	3.07	0.758	0.394	0.001	0.000
Market/Book		mean	0.972	0.310	2.722	0.000	0.001	0.000
		median	0.604	0.116	1.428	0.000	0.000	0.000
Agency Variables								
Profitability:	ROA	mean	0.018	-0.036		0.176		
	ROE	mean	0.204	-6.04		0.263		
Free Cash Flow (Millions)		mean	218.3	-2284.19		0.092		
Stock Ownership:	% Managerial	mean	5.57	8.97		0.211		
	% Institutional	mean	63.65	49.24		0.044		
	# of	mean	50.6 M	53.3 M		0.906		
Analysts		mean	17.54	21.59		0.223		
Compensation:	$ Options / Mkt.	mean	0.023	0.014		0.645		
Board Composition:	% insiders on	mean	0.269	0.315		0.339		
	Size	#	10.63	10.41		0.757		
	CEO=Chairman	%	.754	0.773		-		
Audited by Arthur Andersen		%	0.18	0.50		-		
Restated Earnings		%	.038	0.409		-		

Table II
Event study results - portfolio method

Notes: Abnormal returns were calculated for firm portfolios using standard event study methodology. Because of potential cross-correlation in the error terms**,** portfolios were formed based upon the event date, and the tests were performed on the portfolio abnormal return. The calendar date abnormal returns for the entire sample on June 6, 27 and July 25 were calculated using the constant means-return model. All other event date abnormal returns were calculated using the market model relative to the Value Line equally weighted market index. Listed in parentheses below the abnormal return are the t-statistics for the hypothesis H_0: AR=0. Column one shows the date the firms in the portfolio certified according to the SEC database. Column two shows the abnormal return on the event date, while column three has the cumulative abnormal return for the event date and the following trading day. Column four shows the percentage of firms in each portfolio that had a higher return than the market portfolio on the event date. Certifiers are firms who certified by August 14, 2002, whether they had to or not. Non-certifiers are firms who had to certify by August 14, 2002, but did not file a certification, or did not file the required Exhibit A by that date. The initial tests includes 902 of 940 firms required to certify. The non-certifier sample includes 22 of 25 firms, while the firms certifying on August 14, 2002, includes 205 of 230 firms. We did not have any missing data for the firms certifying on Aug 7, 8, 9, 12 or 13, 2002.

Sample Portfolio		(1) Event date for portfolio	(2) Abnormal Return AR = [0]	(3) Cumulative Abnormal Return CAR = [0,1]	(4) Percentage of firms in sample whose returns were greater than the market's return on the event date
All firms required to certify N=902		June 6	-.0001 (-0.060)	.0001 (0.039)	59.6
		June 27	-.0016 (-0.922)	-.0013 (0.508)	40.8
		July 25	0.0029 (1.655)	0.0071 (1.916)	63.1
Firms failing to certify by Aug. 14, 2002: N=22		Aug. 15	-.0091 (-0.493)	.0145 (0.555)	36.4
Certifiers:	N=205	Aug. 14	-.0015 (-0.441)	-.0014 (-0.298)	46.4
	N=194	Aug. 13	-.0007 (-0.248)	.0052 (1.329)	64.6
	N=86	Aug. 12	-.0033 (-0.912)	-.0081 (-1.582)	46.0
	N=69	Aug. 9	.0068 (1.908)	.0045 (0.898)	61.8
	N=42	Aug. 8	-.0006 (-0.163)	-.0003 (-0.006)	61.4
	N=33	Aug. 7	-.0045 (-0.975)	.0051 (0.780)	47.2

Table III
Event study results - SUR method

Notes: We estimate the coefficients of the following three seemingly unrelated regression systems:

$$(r_{jt} - r_{j,mean}) = \alpha_j + \beta_{1j} D_{1t} + \beta_{2j} D_{2t} + \beta_{3j} D_{3t} + \beta_{4j} D_{4jt} + e_{jt}$$

$$(volume_{jt} / volume_{j,mean}) = \alpha_j + \beta_{1j} D_{1t} + \beta_{2j} D_{2t} + \beta_{3j} D_{3t} + \beta_{4j} D_{4jt} + e_{jt}$$

$$(volatility_{jt} / volatility_{j,mean}) = \alpha_j + \beta_{1j} D_{1t} + \beta_{2j} D_{2t} + \beta_{3j} D_{3t} + \beta_{4j} D_{4jt} + e_{jt}$$

where

$(r_{jt} - rj,mean)$ is the difference between the day t return of stock j and the mean return for stock j over the estimation period;
$(volume_{jt} / volume_{j,mean})$ is the ratio of the daily volume for stock j, and the average daily volume for that security over the estimation period;
$(volatility_{jt} / volatility_{j,mean})$ is the ratio of the absolute value of the daily return for stock j, and the average absolute daily return over the estimation period.
e_{jt} is the day t error term of security j;
D_{1t} is a dummy variable that equals one when day t is June 6, and is zero otherwise;
D_{2t} is a dummy variable that equals one when day t is June 27 or June 28, and is zero otherwise;
D_{3t} is a dummy variable that equals one when day t is July 25 or July 26, and is zero otherwise;
D_{4jt} is a dummy variable that, for certifiers, equals one on day t and day t+1 (where t is the day company j certified), and zero otherwise; and, for non-certifiers, equals one when day t is August 14 or August 15, and zero otherwise.

We test the following four hypotheses for the estimated regression coefficients by calculating F statistics for both full and constrained models:

H1: The sum of the β_{1j} coefficients equals zero.
H2: The sum of the β_{2j} coefficients equals zero.
H3: The sum of the β_{3j} coefficients equals zero.
H4: The sum of the β_{4j} coefficients equals zero.

We perform these tests three times. First, firms that certified are randomly assigned to four sub-samples. The reason for using four sub-samples, each having approximately 180 companies (720 in total) is that the F test requires each firm to have at least 2(J+1) observations. In our case that would mean at least 1445 daily returns; which some companies do not have. Second, we test the hypotheses on the largest sample of companies (that certified by August 14) that have a sufficient number of observations. The sample size is 638 companies with more than 1273 observations. Third, we test the hypotheses on a sample of companies that did not certify (we have data for 22 companies) by August 14, 2002, but were required to. Panel A shows the results of an F-test for significant abnormal returns on the relevant dates leading up to the passage of Sarbanes-Oxley and the CEO certification. Panel B shows the results of tests for abnormal volume, and panel C for abnormal volatility.

Panel A: Abnormal Returns	Sample size	(1) H1: The sum of the β_{1j} coefficients = 0 F-stat (p-values)	(2) H2: The sum of the β_{2j} coefficients = 0 F-stat (p-values)	(3) H3: The sum of the β_{3j} coefficients = 0 F-stat (p-values)	(4) H4: The sum of the β_{4j} coefficients = 0 F-stat (p-values)
I. Certifiers sub-sample 1	(n=180)	1.88 (0.1160)	1.62 (0.1712)	0.84 (0.5015)	0.27 (0.8970)
Certifiers sub-sample 2	(n=180)	1.61 (0.1738)	1.41 (0.2325)	1.22 (0.3040)	0.43 (0.7868)
Certifiers sub-sample 3	(n=180)	1.72 (0.1476)	1.88 (0.1160)	1.53 (0.1954)	0.28 (0.8906)
Certifiers sub-sample 4	(n=182)	1.64 (0.1662)	1.92 (0.1091)	1.04 (0.3881)	0.62 (0.6488)
II. Largest sample of certifiers	(n=638)	1.75 (0.1373)	1.85 (0.1176)	1.47 (0.2097)	0.66 (0.6200)
III. Non-certifiers	(n=22)	0.89 (0.4899)	1.23 (0.3332)	1.71 (0.1916)	1.04 (0.6488)
Panel B: Volume					
I. Certifiers sub-sample 1	(n=180)	1.98 (0.0996)	0.89 (0.4712)	2.01 (0.0951)	0.85 (0.4953)
Certifiers sub-sample 2	(n=180)	1.84 (0.1662)	1.38 (0.2427)	1.88 (0.1160)	0.64 (0.6346)
Certifiers sub-sample 3	(n=180)	1.55 (0.1898)	1.44 (0.2227)	1.43 (0.2260)	1.25 (0.2916)
Certifiers sub-sample 4	(n=182)	1.92 (0.1091)	1.23 (0.2998)	1.77 (0.1369)	1.12 (0.3486)
II. Largest sample of certifiers	(n=638)	2.02 (0.0901)	1.37 (0.2428)	1.78 (0.1311)	1.06 (0.3754)
III. Non-certifiers	(n=22)	1.54 (0.2330)	1.67 (0.2006)	1.43 (0.2646)	1.49 (0.2469)
Panel C: Volatility					
I. Certifiers sub-sample 1	(n=180)	1.14 (0.3393)	0.84 (0.5015)	1.33 (0.2606)	1.93 (0.1075)
Certifiers sub-sample 2	(n=180)	1.62 (0.1712)	0.97 (0.4253)	1.17 (0.3257)	2.11 (0.0815)
Certifiers sub-sample 3	(n=180)	1.72 (0.1476)	1.16 (0.3302)	0.99 (0.4144)	1.84 (0.1232)
Certifiers sub-sample 4	(n=182)	1.74 (0.1432)	1.05 (0.3829)	1.41 (0.2325)	1.96 (0.1026)
II. Largest sample of certifiers	(n=638)	1.81 (0.1252)	1.23 (0.2968)	1.17 (0.3228)	1.97 (0.0975)
III. Non-certifiers	(n=22)	1.57 (0.2251)	1.36 (0.2868)	1.63 (0.2101)	1.51 (0.2412)

Table IV
Non-parametric tests of abnormal volume, volatility or returns

Notes: The market is the Value Line equally-weighted index. Certifiers are firms who certified by August 14, 2002, whether they had to or not. Non-certifiers are firms who had to certify by August 14, 2002, but did not file a certification, or did not file the required Form A by that data. Panel A lists the results of tests in event time (data series arranged relative to each security's certification date), whereas Panel B has the results of tests performed in calendar time. All event time statistics in Panel A were calculated for the period beginning eighty trading days before the event and ending ten trading days after the event, whereas calendar time statistics were based on daily data over the period April 1, 2002 to August 30, 2002. Abnormal returns in event time in Panel A was computed using the market model, whereas abnormal returns in calendar time in Panel B were computed using the constant-means-return model, as the entire market may have reacted to events of the listed dates . Column one reports the results of a t-test which tests whether the daily value for the specified date was significantly different than the series mean. Column one shows statistics for both the value weighted S&P 500 index (1a) and the equal weighted Value Line index (1b). Columns two and three show the results of a Corrado (1989) rank test for the data values on the specified dates for those firms required to certify. p-values are in parentheses.

Panel A: Event Time	Event Date	(1) Market	(2) Certifiers (N=712)	(3) Non-Certifiers (N=22)
Volatility	Certifiers: Date of Certification Non-certifiers: Aug 15		0.48714 (.313)	0.74018 (.230)
Volume	Certifiers: Date of Certification Non-certifiers: Aug 15		-0.49943 (.309)	-0.15176 (.440)
Abnormal Returns	Certifiers: Date of Certification Non-certifiers: Aug 15		0.83280 (.202)	-0.11151 (.456)

Panel B: Calendar Time		Value Weighted (1a)	Equal Weighted (1b)	Certifiers	Non-Certifiers
Volume	June 6		-0.06124 (.476)	0.32211 (.374)	-0.09960 (.460)
	June 27		0.16427 (.435)	1.65520 (.069)	1.48131 (.069)
	July 25		-3.35026 (.000)	2.66344 (.004)	2.38875 (.008)
	Aug. 14		-0.01961 (.492)	1.24809 (.106)	1.00704 (.157)
Volatility	June 6	-2.02189 (.022)	-0.70647 (.240)	0.14581 (.442)	-1.10505 (.458)
	June 27	0.51163 (.304)	-0.29661 (.383)	0.33450 (.369)	-1.58038 (.057)
	July 25	-0.82478 (.795)	0.40921 (.341)	1.10131 (.135)	0.77268 (.220)
	Aug. 14	2.41337 (.008)	-1.44810 (.074)	1.84178 (.033)	0.60461 (.273)
Abnormal Returns	June 6	-1.12549 (.870)	-1.06790 (.857)	-1.19955 (.115)	-1.06440 (.144)
	June 27	1.08611 (.139)	1.13246 (.129)	0.95654 (.169)	0.42466 (.336)
	July 25	-0.20653 (.582)	-0.34233 (.634)	0.40942 (.341)	0.17097 (.432)
	Aug. 14	2.33780 (.010)	1.88134 (.030)	1.79165 (.037)	1.65634 (.049)

Table V
Probit test of the predictability of certification

Notes: This table shows the results of a Probit model testing the predictability of a firm certifying their financial statements. The dependent variable takes a value of one for those firms in the sample who certified, and a value of zero for those firms that failed to certify. The McFadden Pseudo R^2 is calculated as $1-\{Ln\ L(a)\ /\ Ln\ L(o)\}$, where the variable $Ln\ L(a)$ is the log likelihood of the Probit model with all variables included, and $Ln\ L(o)$ is a Probit model with the same dependent variable but no independent variables included. Ownership variables reflect the portion of a firm's equity held by officers of the firm, institutional shareholders, and by shareholders with holdings greater than 5% of the firms outstanding shares. The book values of debt and market value of equity were used in the D/E ratio, while the market to book ratio was calculated by adding the market value of equity to the book value of debt, and then dividing the sum by the book value of the firm. The compensation measure is the dollar value of shares underlying both vested and non-vested options given to each firm's top management as reported in SEC filings, divided by the market value of the firm. Free cash flow was calculated as follows: Earnings before taxes + Depreciation and Amortization - CAPEX - Income taxes - Increase in Net Working Capital. Sales, Cash, FCF, R&D expense, Dividend and Repurchased stock are all scaled by total assets. ROA and ROE are net income divided by the total book value of assets and equity respectively for the 2001 fiscal year. We estimate a Variance Inflation Factor (VIF) for detecting multi-collinearity. The VIF is under the critical value of 20.

Variable		(1) Estimate	(2) Standard Error	(3) Pr > Chi-Square
Intercept	N=693	1.8709	0.802	0.0197
Sales (in Millions)	$	-0.00003	0.0000	0.0550
Total Assets (in Millions)	$	-0.00003	0.0000	0.0242
Debt / Equity Ratio	#	0.00771	0.0111	0.4877
Debt / Total Assets Ratio	#	0.6749	0.639	0.2912
Cash (in millions)	$	0.00127	0.0004	0.0047
R & D Expense (in Millions)	$	-0.00199	0.0008	0.0144
Dividend in 2001-02 (in Millions)	$	-0.00045	0.0011	0.6722
Repurchased Stock in 2001-02 (in Million)	$	-0.00039	0.0002	0.0715
Market to Book Ratio	#	0.00009	0.0000	0.0232
ROE	%	-0.0030	0.3379	0.9929
ROA	%	-0.1104	1.3986	0.9371
FCF (in Millions)	$	0.00023	0.0001	0.0001
% Inside directors	%	-0.9563	0.6682	0.1523
CEO is Chairman (=1 if true)	#	-0.3231	0.3424	0.3454
# of Shareholders	#	0.0000	0.0000	0.0060
%Management Shareholdings	%	0.00368	0.0105	0.7262
%Institutional Shareholding	%	0.0184	0.0073	0.0120
% > Five-Percent Shareholding	%	-0.0116	0.0062	0.0619
$ Options / Mkt. Cap	%	-0.6804	1.6800	0.6855
# of Research firms covering	#	-0.0169	0.0204	0.4079
Restated Earnings (=1 if true)	#	-1.6515	0.3950	0.0001
Audited by Anderson (=1 if true)	#	-0.7987	0.2897	0.0058
McFaddens Pseudo R^2			0.5214	

Table VI
Cross-sectional determinants of the information content of certification

Results from a regression where the abnormal return of each firm that certified its earnings is the dependent variable. All abnormal returns are calculated by subtracting the mean return over the estimation period from each firm's actual return on the specified dates. White corrected t-statistics are given. Ownership variables reflect the portion of a firm's equity held by officers of the firm, institutional shareholders, and by shareholders with holdings greater than 5% of the firms outstanding shares. The book values of debt and market value of equity were used in the D/E ratio, while the market to book ratio was calculated by adding the market value of equity to the book value of debt, and then dividing the sum by the book value of the firm. The P/E ratio was calculated using 2001 earnings per share, and the price as of Dec. 31, 2001. The compensation measure is the dollar value of shares underlying both vested and non-vested options given to each firm's top management as reported in SEC filings, divided by the market value of the firm. Free cash flow was calculated as follows: Earnings before taxes + Depreciation and Amortization - CAPEX - Income taxes - Increase in Net Working Capital. Sales, Cash, FCF, R&D expense, Dividend and Repurchased stock are all scaled by total assets. ROA and ROE are net income divided by the total book value of assets and equity respectively for the 2001 fiscal year. We estimate a Variance Inflation Factor (VIF) for detecting multi-collinearity in all the four regressions; the VIF is less than the critical level of 20 in all four.

| Variable			CAR June 6 - June 26	t-stat	CAR [0,1] June 27, 28	t-stat	CAR [0,1] July 25, 26	t-stat	CAR [0,1] Filing Date	t-stat
Intercept	N = 693		-.03825	-0.37	0.10697	1.98	0.02046	0.47	0.01562	0.14
Sales (in Millions)		$	0.00809	0.49	0.01486	1.96	0.00155	0.25	-0.58877	-2.33
Total Assets (in Millions)		$	-0.000001	-0.62	0.000003	0.23	0.000001	0.09	-0.000001	-0.26
Debt / Equity Ratio		#	0.00147	1.09	0.00092	1.33	0.00025	0.44	0.02363	1.03
Debt / Total Assets Ratio		#	0.10248	1.27	-0.03021	-0.71	-0.01151	-0.34	-0.20797	-0.15
Cash (in Millions)		$	0.08098	0.61	0.05126	0.74	0.00872	0.16	-1.06959	-0.46
R & D Expense (in Millions)		$	0.02599	0.05	-0.29647	-1.06	0.06481	0.29	2.33515	0.25
Dividend in 2001-02 (in Millions)		$	0.41544	0.39	-0.24564	-0.44	-1.42552	-3.16	9.05711	0.48
$ Repurchased Stock in 2001-02 (in Millions)		$	-0.19379	-2.85	0.13878	3.87	0.00393	0.14	-1.01852	-0.85
Market to Book Ratio		#	2.78E-7	0.34	-1.01E-7	-0.24	1.53E-7	0.44	0.000010	0.66
ROE		%	-0.00535	-0.14	-0.05952	-2.93	0.00823	0.50	-1.31199	-1.93
ROA		%	-0.03839	-0.15	0.09710	0.66	0.07591	0.64	11.25989	2.29
FCF (in Millions)		$	-0.00072	0.00	-0.12479	-1.04	-0.00823	-0.09	0.14221	0.04
Inside Directors		%	0.00137	0.02	-0.03113	-0.72	0.00262	0.08	0.69810	0.49
CEO is Chairman (=1 if same)		#	-0.02209	-0.61	-0.00022	-0.01	-0.01210	-0.79	-0.21864	-0.35
# of Shareholders		#	-6.74E-11	-1.21	1.28E-11	0.33	7.24E-12	0.23	3.49E-10	0.27
% Management Shareholdings		%	-0.00075	-0.51	-0.00065	-0.85	0.00005	0.08	0.00369	0.14
%Institutional		%	-0.00025	-0.27	-0.00055	-1.15	0.00016	0.41	0.03179	2.00
% >Five-Percent Shareholding		%	0.00035	0.43	-0.00031	-0.76	0.000006	0.02	0.00312	0.22
$ Options / Mkt. Cap		%	0.04137	0.12	0.54120	1.53	0.05416	0.19	-2.86674	-0.24
# of Research firms covering		#	0.00088	0.45	-0.00057	-0.54	0.00026	0.31	0.03109	0.88
Restated Earnings (=1 if restated)		#	0.02515	0.31	-0.01891	-0.44	0.03460	1.00	-0.52689	-0.37
Audited by Anderson (=1 if true)		#	-0.01237	-0.31	-0.03074	-1.47	0.00109	0.06	-0.42659	-0.61
Certified, not required by Aug 14 (=1 if true)		#							0.83850	0.94
Adjusted R^2			0.0243		0.0304		0.0005		0.0322	
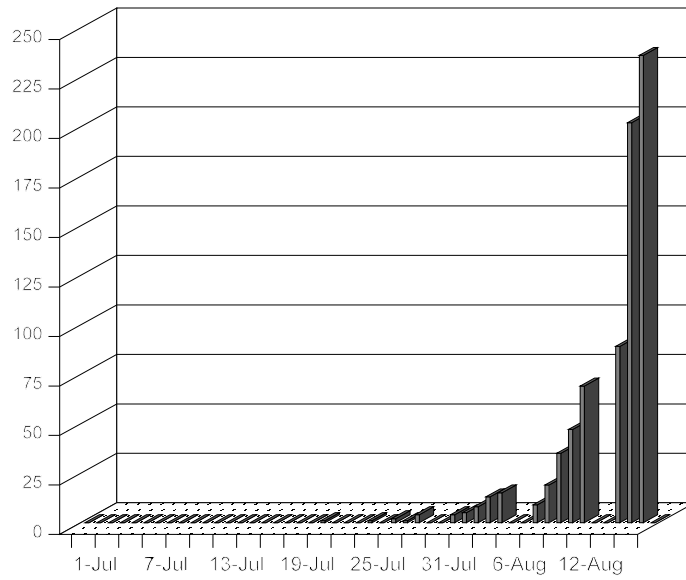
Figure 1: Certifications across calendar time. The number of certifications for each trading date from the date of announcement on June 27, 2002 to the day following the certification deadline, August 15, 2002. These include all who had to certify by August 14, 2002 and did, as well as those who did not have to certify by August 14, 2002, but did.
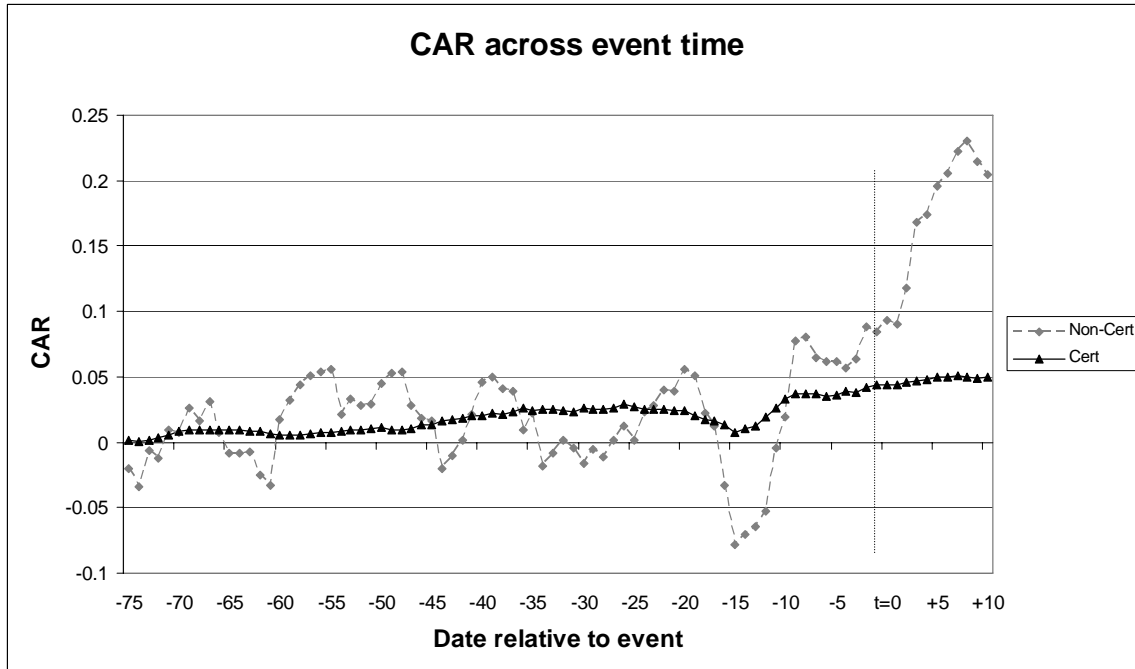
CAR across event time

Figure 2: Cumulative abnormal returns over event time. Figure two shows the accumulation of abnormal returns for certifiers (non-certifiers) beginning seventy-five days before each firm's certification date (August 15, 2002), and continuing for ten days following the event, with the event date indicated by the vertical dashed line. Market model estimates come from the period beginning 219 days before the event, and ending 97 days before the event. Abnormal returns for each stock is calculated by the following formula: $AR_{it} = K_{it} - \alpha_i - \beta_i K_{mt}$ where K_i is the return on security i on date t, and Km_t is the market return on date t, and α and β are the estimates derived from the regression of the firms returns on the Value Line Index in the estimation period. Portfolio abnormal returns are then calculated by averaging the abnormal returns for each firm in the portfolio on the date relative to the event. This portfolio abnormal return is then added onto the sum of all previous daily abnormal returns to get the new cumulative abnormal return.
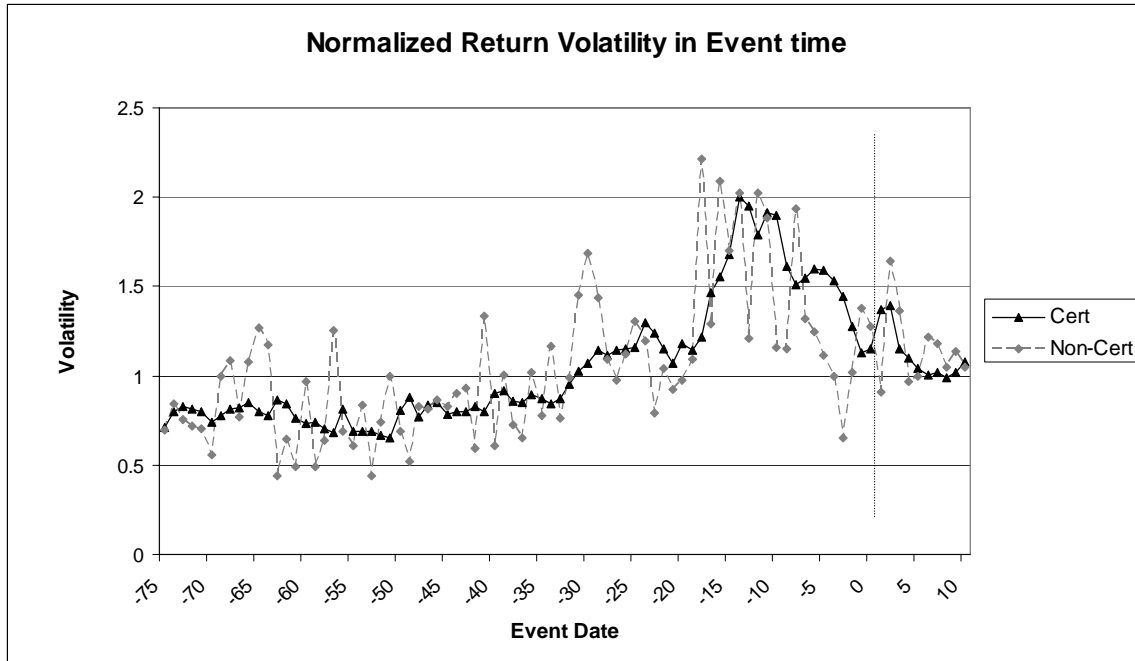
Figure 3: Normalized volatility in event time. Figure three shows normalized absolute price movements for the two portfolios over the period beginning seventy-five days prior to the event, and extending for ten days after the event, with the event date indicated by the vertical dashed line. The event is the certification date (August 15, 2002) for the certifiers (non-certifiers). Values are calculated by taking the absolute value of each daily return for each firm in the portfolio. A mean is then calculated for each firm's absolute daily returns, and each daily absolute return is divided by the firm's mean. The portfolio's average normalized price movement for a day is then calculated by taking the average of daily normalized price movements for all firms in the portfolio for each day relative to the event date.
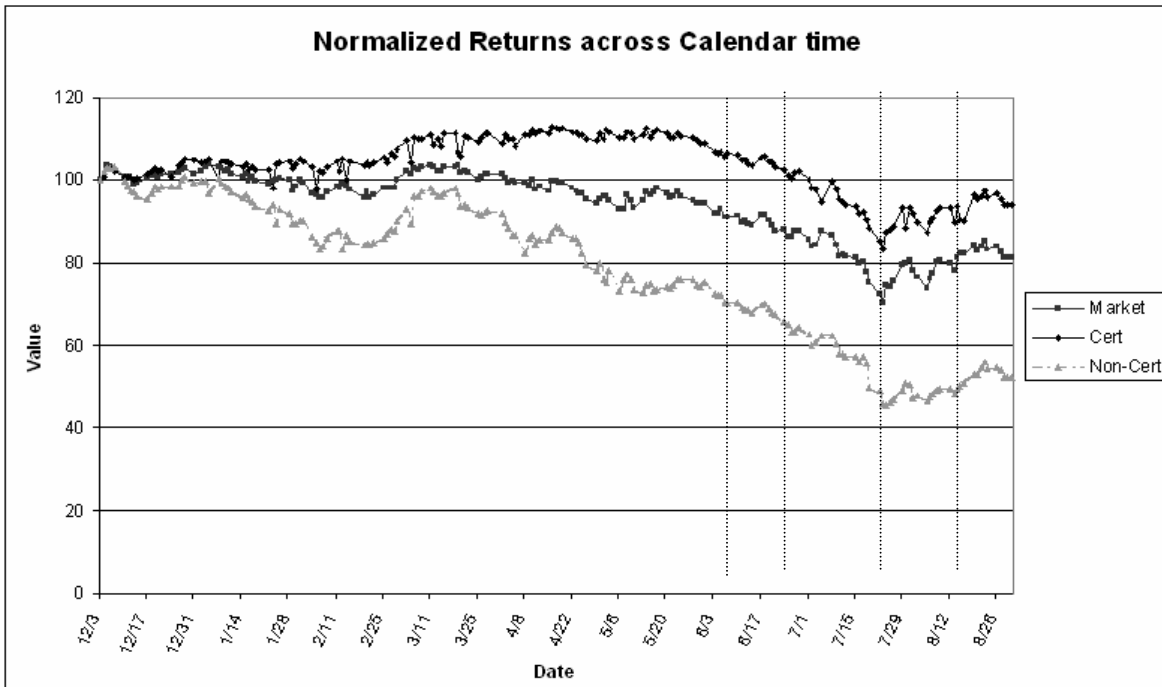
Figure 4: Normalized returns across calendar time. Figure four shows the portfolio value of $100 invested in three value-weighted portfolios during the period beginning December 3, 2001 and continuing through August 30, 2002. June 6th and 27th, July 25th and August 14th are marked with vertical dashed lines. The certifier portfolio consists of those firms who certified by the required date, while the non-certifier portfolio consists of those who did not certify, or did not file the required form without amendment. The third, market portfolio, is the value-weighted S&P 500 index.
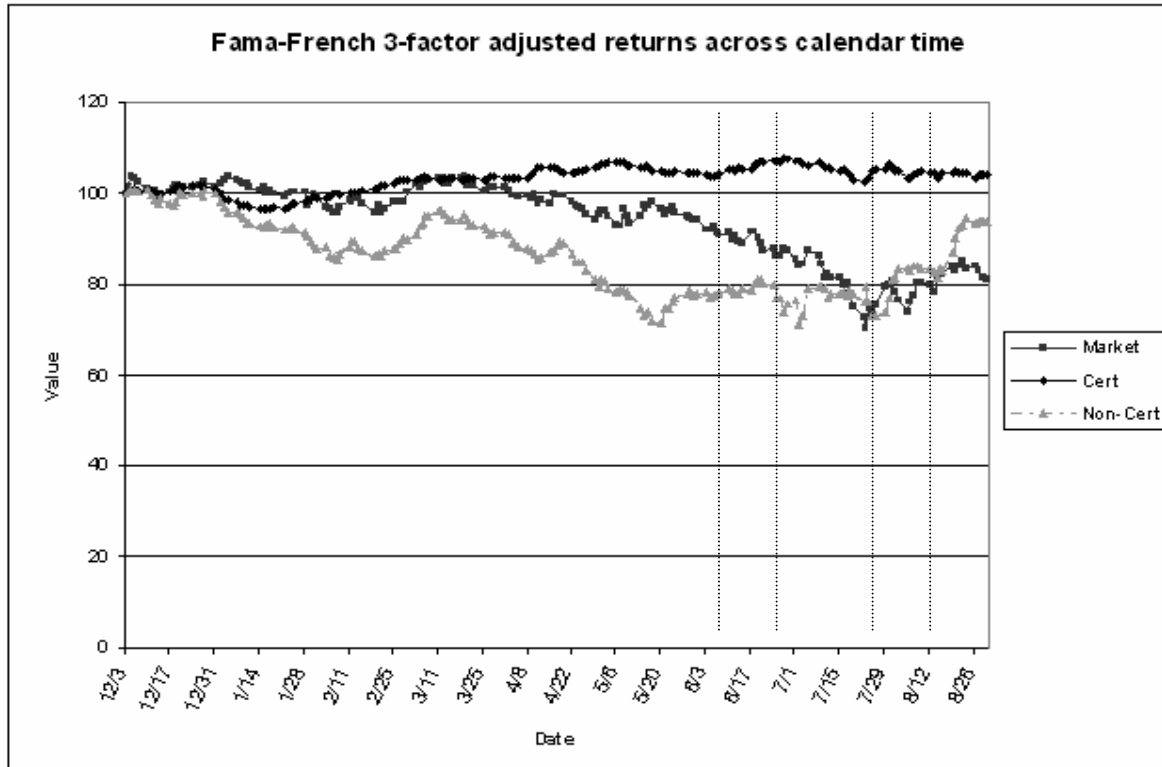
Figure 5: Fama-French 3 factor adjusted returns across calendar time. Figure five shows the cumulative abnormal return in three value-weighted portfolios during the period beginning December 3, 2001 and continuing through August 30, 2002. June 6th and 27th, July 25th and August 14th are marked with the dashed lines. The certifier portfolio consists of those firms who certified by the required date, while the non-certifier portfolio consists of those who did not certify, or did not file the required form without amendment. The third, market portfolio, is the value-weighted S&P 500 index. For the certifier and non-certifier portfolios, the portfolio value reflects abnormal returns to the portfolio using the Fama and French three-factor model to control for risk in the portfolio. For the market portfolio, portfolio value reflects abnormal returns, but these abnormal returns are calculated by subtracting the mean market return during the estimation period from the actual daily market return for each date.
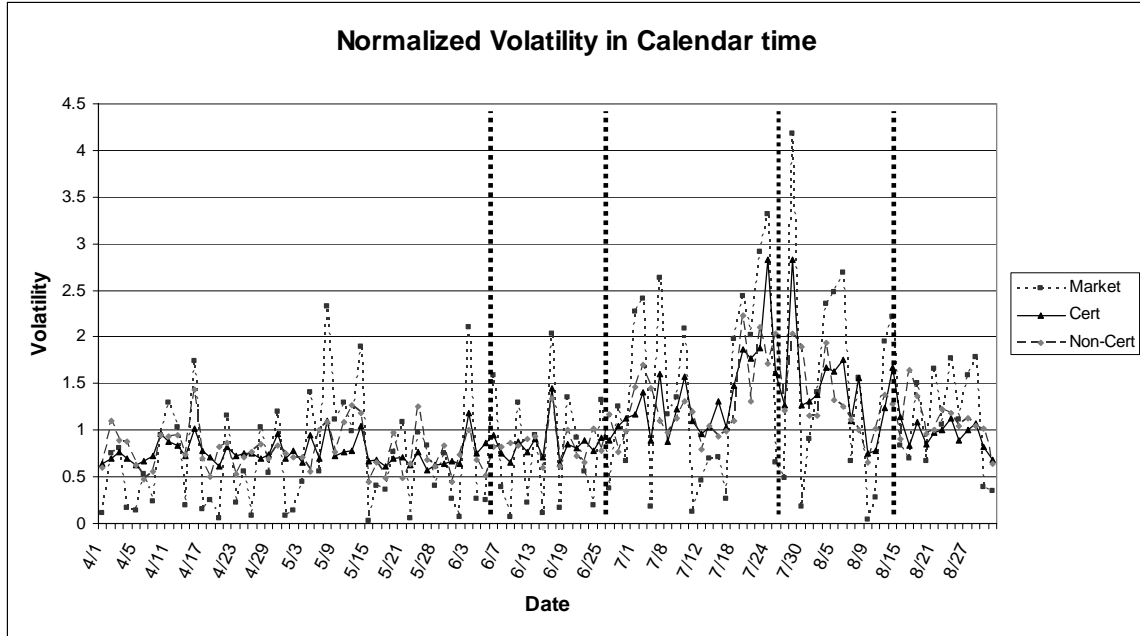
Figure 6: Normalized volatility in calendar time. Figure six shows normalized absolute price movements for the two portfolios and the market over the period beginning April 1, 2002, and ending on August 30, 2002. June 6th and 27th, July 25th and August 14th are marked with vertical dashed lines. Values are calculated by taking the absolute value of each daily return for each firm in the portfolio. A mean is then calculated for each firm's absolute daily returns, and each daily absolute return is divided by the firm's mean. The portfolio's average normalized price movement for a day is then calculated by taking the average of daily normalized price movements for all firms in the portfolio for each calendar date.