

**A Look at the Market's Reaction to the
Announcements of SEC Investigations**

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I. Introduction

The Securities and Exchange Commission was formed as a result of the stock market crash of 1929. During the crash, the market value of securities listed on the New York Stock Exchange dropped 83%, from \$89 billion to \$15 billion. Some of the causes of the crash were found to be a pre-crash speculative frenzy, artificially inflated trading activity, false and misleading information published by companies listed on the exchange, and insider trading.¹ Congress passed the Securities Act of 1933 and the Securities Exchange Act of 1934 to regulate companies that wanted to raise capital through the financial markets. The SEC was formed in 1934 to enforce these laws, protect investors, and maintain the integrity of the markets. SEC investigations have been a vital tool to allow the SEC to fulfill its objectives.

The purpose of this paper is to provide insight on the events that surround the announcement of an SEC investigation of a company, which includes the equity market's reaction to the announcement, the events leading up to the announcement, and the performance of the stock following the announcement. One cannot discuss investigations of fraud without considering corporate governance. This paper will also test the hypothesis that companies with strong corporate governance have lower agency costs, so investors' reactions to accusations of possible fraud will be less severe.

II. Background on SEC Investigations

Following an announcement by a company that it will restate past earnings, the SEC will generally commence an informal investigation that looks into the events that led up to the restatement. As the investigation proceeds, if the SEC finds sufficient reason to believe that fraud

¹ Afterman, Allan B., SEC Regulation of Public Companies, (Prentice-Hall, 1995).

did occur, the SEC can issue a formal order of investigation. The formal order allows the SEC to issue subpoenas that provide greater access to company documents and executives. A formal order may also be issued without a prior informal investigation. The SEC does not publicly announce the initiation of SEC investigations. Therefore, disclosure comes as a result of the company issuing a press release or through a filing made by the company with the SEC.

There is a clear distinction between the wording companies will use when they disclose informal and formal investigations. Investors will try to value the immensity of the investigation through the information provided by the company. Therefore, it is important to analyze the two types of investigations separately.

III. Data Sample

Because the SEC does not publicly disclose the initiation of an investigation, to gather the sample data I was reliant on the companies to disclose the event to investors through its annual filings with the SEC.

The sample time period for events to occur was defined to be 1998 through 2003. There were between 8,000 and 11,000 10-K's filed with the SEC each year from 1998 to 2004. A program was used to download all 10-K's filed with the SEC during this period from the SEC website. Another program searched through each 10-K, looking for announcements of SEC investigations. Two methods were used to find the disclosures: 1) the program searched for the "Legal Proceedings" section of each 10-K. Within this section, any mention of the SEC (or any variant on the name) was flagged. 2) The program searched the entire text of the 10-K for any mention of the SEC (or any variant on the name). It then searched for words such as investigation, complaint, injunction, action against, violation, or enforcement action within two text lines of the SEC reference. The program flagged all matches.

Because the layout and format of the 10-K's varied for each filing, and often the words SEC and investigation were in close proximity, but not as the result of an SEC investigation disclosure (particularly within the Sarbanes-Oxley sections of later filings), the program flagged many false positives. Each reference found by the program was manually checked to narrow down the list to actual SEC investigations of companies. SEC investigations relating solely to the actions of current or previous company executives were not included.

From this list I was able to backtrack from the original 10-K filing, looking in previous year's annual, quarterly, and current filings, as well as press releases to arrive at the exact date that the investigation was made public. For each investigation reference, I also looked for the data relating to the informal or formal investigation announcement, depending on which was originally found. If there were no press releases or 8-K filings with the SEC that referenced the investigation, I had to rely on the first occurrence of the investigation within a quarterly or annual filing as the date that the investigation was made public. Of the entire sample of informal and formal investigations, 65% were found in press releases, 7% in 8-K's, 12% in quarterly reports, and 16% in annual reports.

The data sample for which returns existed within the CRSP database consists of 71 informal investigation and 174 formal investigation events. For 34 companies, announcements of informal and formal investigations were found. Therefore, 34 companies that are included in the formal investigation sample are also included in the sample of informal investigations.

This procedure produced an unbiased sample of SEC investigations. The search program undoubtedly missed some SEC investigation references, or some companies may have chosen not to disclose an investigation within its annual reports. Therefore, the data sample should not

be considered to be the entire universe of SEC investigations that were announced during the sample period.

IV. Data Analysis Tools

The Eventus software program was used to calculate the abnormal returns of the stocks following the announcements of the investigations. Eventus analyzes stock returns that it reads from the Center for Research in Security Prices (CRSP) database. For each stock, it estimates a beta using an estimation period that ends before the event date. It then calculates the abnormal return for the stock during the event window by subtracting from the actual return the normal return for the stock, given the market's return during the event window. The market was defined to be a value weighted portfolio of all stocks within the CRSP database during the event period. The CRSP database includes stock price, volume, and return information from the NYSE, AMEX, and Nasdaq markets.

The Investor Responsibility Research Center (IRRC) provides research on corporate governance, proxy voting, and corporate responsibility issues. Gompers, Ishii, and Metrick used data published by the IRRC to construct a governance index that covers about 1,500 companies. The index is a measurement of the balance of power between shareholders and managers. A rating for each firm is calculated by adding one point for each provision that reduces shareholder rights, with a maximum rating of 24. Firms with low governance index ratings will have low management power and strong shareholder rights. Firms with high governance index ratings will have high management power and weak shareholder rights.²

OptionMetrics is a database of historical price and implied volatility data for the U.S. equity and index options markets. OptionMetrics computes a volatility surface through

² Gompers, Paul, Joy Ishii, and Andrew Metrick, "Corporate Governance and Equity Prices," Quarterly Journal of Economics (Feb 2003), 107-155.

interpolation of implied volatilities of similar options. OptionMetrics volatility surface was used to analyze the change in the implied volatilities of the options on the underlying stocks in the investigation samples on the days leading up to the announcements.

V. Event Study Results

A window of -1 to +1 days from the event date was used to calculate the cumulative abnormal returns for the informal and formal investigations. During the window around the announcement of informal investigations, the mean cumulative abnormal return is -6.18%, significant at 0.1%. The median abnormal return is -3.15%. During the window around the announcement of formal investigations, the mean cumulative abnormal return is -6.23%, significant at 0.1%, with a median abnormal return of -3.05%.

The abnormal return for the sample of 34 companies that had previous informal investigation announcements is -8.50%, significant at the 0.1% level. The additional decline in value results from the escalation to a formal order, which implies a longer investigation period resulting in higher legal expenses, and the SEC found sufficient reason to continue the investigation. The average number of days between the informal and formal investigation announcements in the sample is 138 days. Some companies in the formal investigation sample may have had previous informal investigations that occurred before the beginning of the sample period. Therefore, the analysis of returns for companies in the formal investigation sample that are not included in the informal investigation sample is not relevant.

VI. Events Prior to Announcement Date

The decline in market value as a result of the announcement of an informal or formal investigation is similar; for both events, there is an abnormal return of about -6%. However,

informal and formal investigations differ greatly with respect to the events that lead up to the announcement. Put and call option implied volatilities were used to analyze the market's uncertainty of the stock's value prior to the investigation announcements. Implied option volatility has been found to be a very good predictor of future volatility for stock indexes³ and individual stocks⁴.

Option volatility surfaces calculate the implied volatilities on virtual options with the same maturity and delta ratio at different points in time. The implied volatility is computed through interpolation using traded options with maturities and delta ratios that straddle the maturities and delta ratios of the options in the volatility surface. Therefore, the effects of time to maturity and movement of the underlying asset price are not reflected in the volatility surface. The change in implied volatilities across time is only a function of the markets perception of the future distribution of the underlying asset's value.

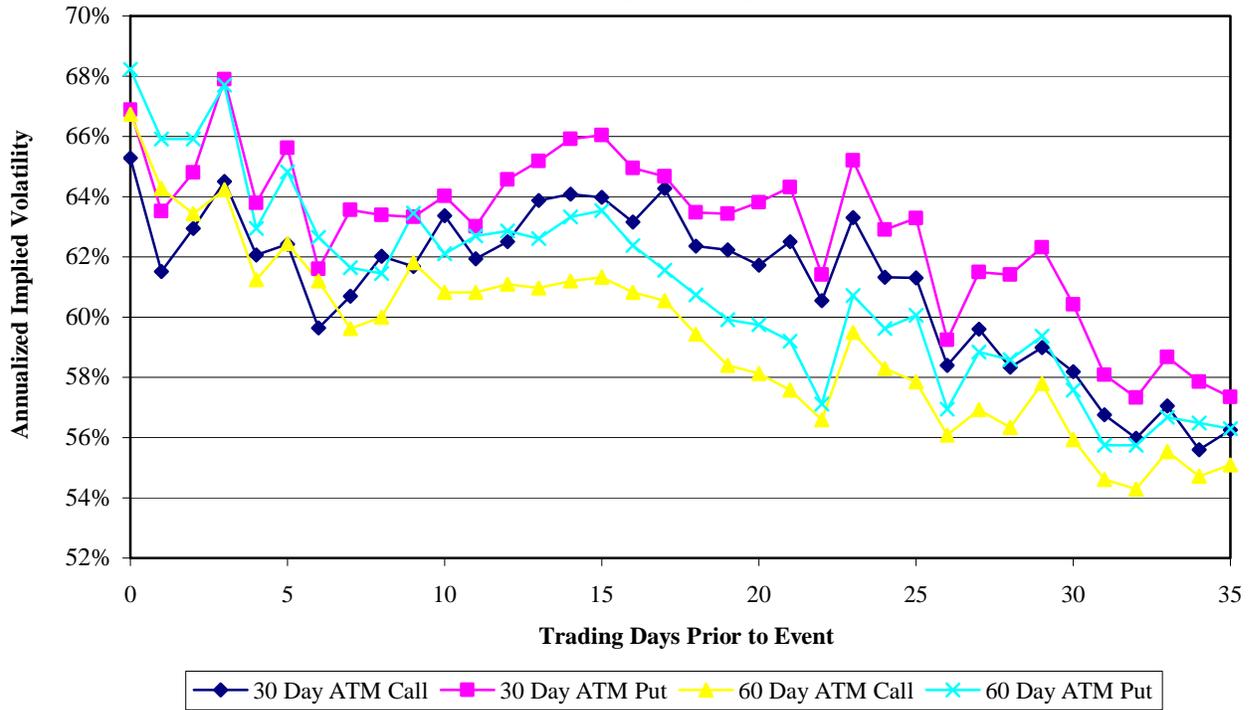
The implied volatilities of at the money puts and calls with 30 days and 60 days to maturity were compared for each day leading up to the event for informal and formal investigations. 30 and 60 day maturity options were chosen because of their high liquidity. For each trading day prior to the event, the average implied volatility across the sample for each option was computed. Option data is not available for all stocks within the investigation samples. The table below provides the range of the number of stocks with available option data that were included in the daily average implied volatilities, and the two graphs chart the results.

| | Informal Investigations | Formal Investigations |
|---------------------------|--------------------------------|------------------------------|
| | <u>Option Data</u> | <u>Option Data</u> |
| 30 Day ATM Calls and Puts | 36 to 42 | 79 to 86 |
| 60 Day ATM Calls and Puts | 39 to 43 | 84 to 92 |

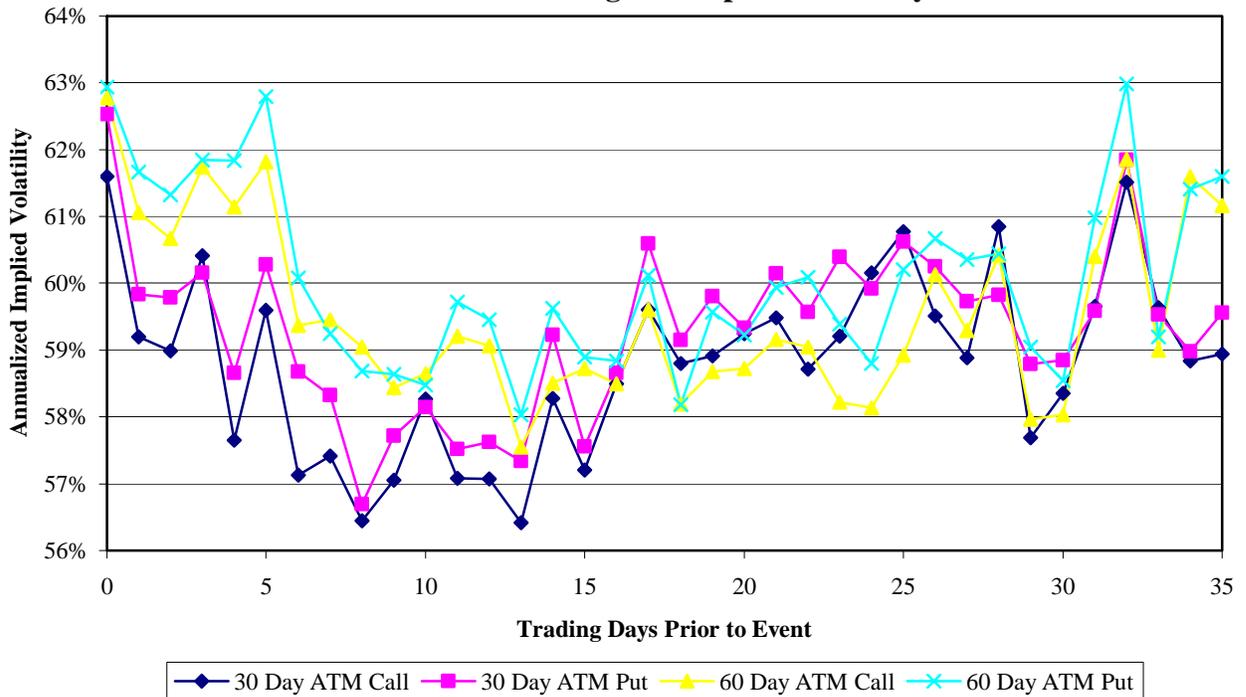
³ Christensen, B.J., N.R. Prabhala, "The Relation Between Implied and Realized Volatility," Journal of Financial Economics 50 (1998) 125-150.

⁴ Lamoureux, Christopher G., William D. Lastrapes, "Forecasting Stock-Return Variance: Toward an Understanding of Stochastic Implied Volatilities," The Review of Financial Studies (1993 Volume 6, number 2) 293-326.

Informal Investigation Option Volatility



Formal Investigation Option Volatility



The graph of the implied volatilities for options of informal investigation events shows a steady increase across the 35 day period; on the days leading up to the event, the value of at the money puts and calls is steadily increasing. The graph of the implied volatilities for options of formal investigation events shows a sudden rise at about 8 to 10 trading days prior to the event. There is a steady, slight decline in the implied volatilities of at the money options at days greater than 10, but at day 10, the 60 day options' implied volatilities begin to rise and at 8 days prior, the 30 day options' implied volatilities jump.

Informal investigations generally follow earnings restatements. Earnings restatements increase the uncertainty about the firms' value as the market attempts to assess the implications for future earnings and cash flows. There is also additional uncertainty due to the possibility of an SEC investigation and the most probable outcome if it were to occur. This uncertainty is reflected in the steady rise in implied volatilities prior to informal investigation announcements.

In contrast, the announcements of formal investigations are most likely unexpected. At days greater than 10 prior to formal investigation announcements, the market's uncertainty of future prices is declining. The sudden increase in implied volatility 8 to 10 days before the announcement suggests the existence of information events prior to the investigation announcement that increases investors' uncertainty.

For both types of investigations, the market's uncertainty of the stock's value prior to the actual announcement is relatively high. However, neither type of investigation announcement is completely anticipated, which is reflected in the large negative abnormal return and the jump in implied volatilities as a result of the announcements.

VII. Breakdown of Abnormal Returns

The following table shows the abnormal returns for informal and formal investigations, broken down by market capitalization one week prior to the event, the year of the event, and governance index rating.

| | Informal Investigations | | | Formal Investigations | | |
|----------------------|-------------------------|---------------|---------------------|-----------------------|---------------|---------------------|
| | <u>N</u> | <u>Mean</u> | <u>Significance</u> | <u>N</u> | <u>Mean</u> | <u>Significance</u> |
| Overall | 71 | -6.18% | 0.1% | 174 | -6.23% | 0.1% |
| Market Cap | | | | | | |
| Micro | 21 | -3.89% | 0.1% | 73 | -7.23% | 0.1% |
| Small | 15 | -12.14% | 0.1% | 27 | -7.83% | 0.1% |
| Medium | 19 | -6.34% | 0.1% | 25 | -8.42% | 0.1% |
| Large | 16 | -3.40% | 1.0% | 48 | -2.78% | 0.1% |
| Year | | | | | | |
| 1998 | 3 | -3.24% | | 15 | -8.28% | |
| 1999 | 5 | -13.86% | | 11 | -6.09% | |
| 2000 | 4 | -20.59% | | 23 | -7.65% | |
| 2001 | 4 | -2.16% | | 19 | -5.62% | |
| 2002 | 34 | -3.86% | | 51 | -5.71% | |
| 2003 | 21 | -6.54% | | 55 | -5.78% | |
| Market | | | | | | |
| Bull ('98, '99, '03) | 29 | -7.46% | 0.1% | 81 | -6.29% | 0.1% |
| Bear ('00, '01, '02) | 42 | -5.29% | 0.1% | 93 | -6.17% | 0.1% |
| G Index | | | | | | |
| Gov >= 9 | 23 | -4.17% | 0.1% | 46 | -7.06% | 0.1% |
| Gov < 9 | 20 | -3.19% | 5% | 40 | -5.48% | 0.1% |

Large market capitalization companies have a smaller decline in value than smaller capitalization companies. The market believes that the risk and expenses associated with a SEC investigation can be better absorbed by large capitalization companies. Large capitalization companies are more deeply covered by analysts. Investors may believe that they better

understand the risks associated with large capitalization stocks, so there is less of a reaction to the investigation announcements.

If 1998, 1999, and 2003 are defined to be bull markets and 2000, 2001, and 2002 to be a bear market, the data shows that the market reacts differently to informal investigation announcements during each type of market. There is a much smaller decline in value during bear markets.

To analyze the event results by governance index rating, the most recent governance rating prior to the date of the event was used. The average governance rating for all companies within the IRRC database for the rating periods 1998, 2000, and 2002 is 8.93. Therefore, the abnormal returns given the companies governance index rating relative to the index average is computed. Governance ratings are not available for all companies within the sample, so analysis by this index reduces the samples.

A high governance rating indicates weak shareholder rights and poor corporate governance. As may be expected, companies with better corporate governance have a smaller decline in value. For companies with strong governance, investors believe that the processes are in place to prevent fraud, and if it did occur, for it to be remedied with haste and minimal additional expense.

The data shows that companies with large market capitalization and companies with strong corporate governance will have the smallest decline in market value as a result of the announcement of an SEC investigation. However, it is not true that larger market capitalization companies have stronger corporate governance; rather, it is the opposite. Gompers, Ishii, and Metrick found a correlation of 0.15, significant at the 1% level, between market capitalization

and the governance index rating. 49% of the firms within the highest decile of the governance index (the companies with the weakest shareholder rights), are included in the S&P 500.⁵

The following table shows the correlation between the abnormal returns, a dummy variable representing large capitalization firms, and the governance index rating for the informal and formal investigation samples.

| Informal Investigations | | | Formal Investigations | | |
|-------------------------|--------|-----------|-----------------------|--------|-----------|
| | Return | Large Cap | | Return | Large Cap |
| Large Cap | 0.082 | | Large Cap | 0.136 | |
| P-value | 0.499 | | P-value | 0.075 | |
| Gov Rating | -0.013 | 0.303 | Gov Rating | -0.079 | 0.357 |
| P-value | 0.936 | 0.048 | P-value | 0.472 | 0.001 |

There is a significant positive correlation between the large capitalization dummy variable and the governance rating, and the abnormal returns have a greater correlation with the large capitalization dummy variable than the governance rating. This suggests that corporate governance is not the dominant factor affecting the market's reaction to the announcement of SEC investigations.

It is interesting to note that the number of investigation events increases significantly in 2002. There are several reasons that may explain this increase. The public unraveling of Enron began in October 2001. Enron was shortly followed by several corporate scandals, such as Tyco, WorldCom, Xerox, Adelphia, Merrill Lynch, and Arthur Anderson. This series of corporate fraud rattled investors and made them weary of company management; it created doubt about the integrity of the system.⁶ Therefore, the SEC would want to step up its enforcement actions to catch the fraud before investors are harmed and renew the public's trust in the system.

⁵ Gompers, Paul, Joy Ishii, and Andrew Metrick, "Corporate Governance and Equity Prices," Quarterly Journal of Economics (Feb 2003), 107-155.

⁶ Skousen, Fred K., Steven M. Glover, Douglas F. Prawitt, An Introduction to Corporate Governance and the SEC, (Thomson, 2005).

The beginning of 2000 marked the bursting of the technology bubble and the subsequent recession. During periods of low profitability, it is more difficult to disguise and sustain accounting fraud. Therefore, there will be more accounting restatements, followed by SEC investigations.

The following table shows the number of investigations that were opened by the SEC and formal orders issued during its fiscal years, which end September 30.⁷

| | <u>1999</u> | <u>2000</u> | <u>2001</u> | <u>2002</u> | <u>2003</u> |
|-----------------------|-------------|-------------|-------------|-------------|-------------|
| Investigations Opened | 520 | 558 | 570 | 479 | 910 |
| Formal Orders Issued | 282 | 345 | 324 | 300 | 254 |

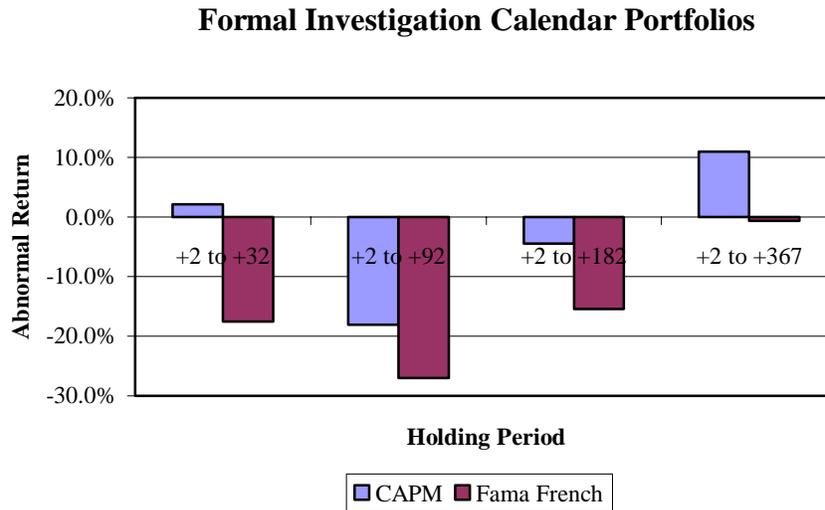
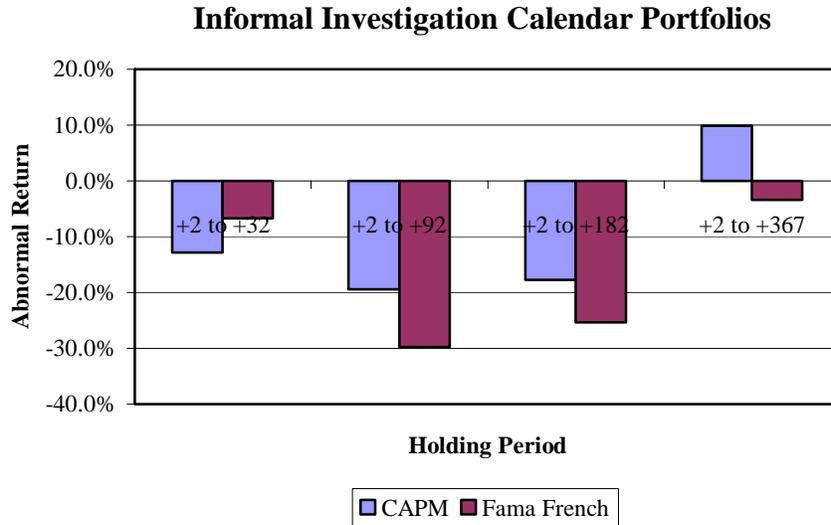
In the fiscal year 2003, the SEC almost doubles the number of investigations opened. The last three months of 2002 that coincide with the SEC's fiscal year 2003 could explain some of the increase in investigations in the sample that were made public in 2002. However, the events in the sample are defined to be the day that the investigation is made public by the company. The increase in the number of events for 2002 is more likely the result of an increase in the number of disclosures of SEC investigations, which may have been initiated in previous years.

VIII. Calendar Portfolios

To analyze how the stocks in the samples performed following each event, calendar portfolios were constructed. At two days following the announcement of the investigation, one share of the stock is added to the portfolio and is held in the portfolio for a defined period of time. If at any time during the holding period the stock is delisted, the stock is sold from the portfolio the following day. Therefore, the calendar portfolios include the delisting return. Abnormal returns for the portfolio were computed using the capital asset pricing model and

⁷ From SEC Annual Reports for 2003, 2002, 2001, 2000, 1999, <http://www.sec.gov/about/annrep.shtml>

Fama French three factor model. The charts below show the abnormal returns for the portfolios for different holding periods.



The change in abnormal returns for increasingly longer holding periods for the informal investigation portfolios and formal investigation portfolios are very similar. The graphs show that following the announcement of an SEC investigation, the stock will continue to underperform the market for the next three months. However, after three months, the returns improve and the stock returns to breakeven within one year.

IX. Conclusion

Informal SEC investigations generally follow earnings restatements. The implied volatilities on put and call options show that prior to the informal investigation announcements the market's uncertainty of future prices is increasing. Following the announcement, the stock has an abnormal return of -6.18%. The announcements of formal investigations, in comparison, are unexpected. Implied option volatilities do not steadily increase prior to the announcement event. Rather, the options show a jump in implied volatility at 8 to 10 days prior to the event. Following the formal investigation announcement, the stock has an abnormal return of -6.23%.

Due to the disclosure of an SEC investigation, the company loses six percent of its market value. The six percent in lost value is the market's assessment of the future legal fees and settlement fines, and loss due to a decline in the market's perception of the company's corporate governance standards. However, it is arguable how heavily the market weighs corporate governance, so the loss due to a decline in corporate governance may only be a small portion. In the case of the announcement of an SEC investigation, corporate governance is not the main factor that affects the amount of value lost. Whether or not the company has a large market capitalization has a greater correlation with the abnormal returns.

For the three months following the investigation announcement, the value of the stock continues to underperform the market, as new information regarding the extent of the investigation and possible fraud is released. However, after three months, the stocks reflect a regression towards the mean; the stocks in the investigation portfolios outperform the market. For a holding period of one year, the investigation portfolios have a return that is about equal to that of the market.

Appendix:

Top 10 Biggest Decliners

| | <u>Announcement</u> | <u>Market</u> | <u>Governance</u> | <u>Abnormal</u> | |
|--------------------------------|---------------------------------------|----------------|-------------------|-----------------|---------|
| | <u>Date</u> | <u>Cap (-7</u> | <u>Rating</u> | <u>Return</u> | |
| | | <u>Days)</u> | | | |
| <u>Informal Investigations</u> | | | | | |
| 1. | DYNACQ HEALTHCARE INC | 12/18/03 | 224 | -80.11% | |
| 2. | EBT INTERNATIONAL INC/INSO CORP | 02/01/99 | 388 | -77.14% | |
| 3. | PINNACLE HOLDINGS INC | 08/07/00 | 2,717 | -39.03% | |
| 4. | LUMENIS LTD | 02/25/02 | 518 | -38.61% | |
| 5. | NASH FINCH CO | 11/08/02 | 158 | 15 | -34.11% |
| 6. | COMPUTER ASSOCIATES INTERNATIONAL INC | 02/22/02 | 15,586 | 9 | -27.58% |
| 7. | SYMBOL TECHNOLOGIES INC | 02/15/02 | 3,058 | 8 | -26.70% |
| 8. | MAXIM GROUP INC | 07/13/99 | 162 | | -22.95% |
| 9. | CMS ENERGY CORP | 05/10/02 | 2,703 | 9 | -20.71% |
| 10. | IMCLONE SYSTEMS INC | 01/25/02 | 1,547 | 4 | -19.75% |
| <u>Formal Investigations</u> | | | | | |
| 1. | PENNCORP FINANCIAL GROUP INC | 08/20/98 | 319 | 6 | -79.37% |
| 2. | ANIKA THERAPEUTICS INC | 05/30/00 | 82 | | -77.93% |
| 3. | INTERWORLD CORP | 04/03/01 | 9 | | -77.71% |
| 4. | ENTERASYS NETWORKS INC | 02/01/02 | 1,986 | 10 | -57.86% |
| 5. | NASH FINCH CO | 02/05/03 | 99 | 15 | -54.12% |
| 6. | L90 INC/MAXWORLDWIDE INC | 02/04/02 | 51 | | -39.50% |
| 7. | PINNACLE HOLDINGS INC | 10/12/00 | 1,250 | | -33.90% |
| 8. | CRYOLIFE INC | 08/05/03 | 144 | | -32.88% |
| 9. | CENDANT CORP | 07/14/98 | 19,100 | 11 | -32.05% |
| 10. | CRITICAL PATH INC | 04/05/01 | 116 | | -27.56% |