ABSTRACT

Title of dissertation: EMPIRICAL ESSAYS IN CORPORATE FINANCE

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Over the past twenty years, write-offs have grown in popularity. With the increased usage of write-offs, it is becoming more important to understand the mechanisms behind why companies take write-offs and how write-offs affect company performance. In this paper, I examine the cross-sectional determinants of the decision to take write-offs. I use a hand-collected dataset on write-offs that is much more comprehensive than existing write-off datasets. Contrary to much hype and scandals surrounding a few write-offs, I find that quality of governance is *positively* related to write-off decisions in the cross-section. My results also suggest that poor governance companies wait to take write-offs until it becomes inevitable, while well-monitored companies take write-offs sooner. As a result, the charge is substantially larger than the average write-off charge. When these poor governance companies announce write-offs, the announcement generates negative abnormal returns. However, when good corporate governance companies announce write-offs, the charge is substantially smaller than the average charge. These well-monitored companies take write-offs immediately following a problem. Following the write-off announcements of these types of companies, average announcement day effects exceed a *positive* six percent. These results suggest that companies with quality monitoring mechanisms use write-offs in a manner that is consistent with enhancing shareholder value.

In my second essay I examine the effect of write-off announcements on the stock market liquidity of firms taking write-offs from 1980 to 2000. I find that there are substantial improvements in stock market liquidity following corporate write-offs. Spreads decrease and turnover volume increases after write-off announcements, which indicates an improvement in liquidity. The liquidity

improvement is greater for better governed companies. I decompose bid-ask spreads and show that adverse selection costs decrease substantially as market participants respond to the write-off announcement. The evidence suggests a liquidity benefit of write-offs that must be weighed against any other perceived cost of write-offs. Such a liquidity benefit may validate that write-offs convey favorable information about the firm.

EMPIRICAL ESSAYS IN CORPORATE FINANCE

by

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This dissertation is dedicated to my parents Pam and Tom Minnick.

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It is impossible to remember all, and I apologize to those I have inadvertently left out.

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Chapter 1

Write-offs and Corporate Governance

1.1   Introduction

Write-offs have become increasingly common in the past two decades. The consumer-manufacturing
sector alone had write-off charges totaling over $2 billion in 2000 compared to $800 million in 1980,
an increase of 250 percent.

There are three potential explanations for why companies take write-offs. First, write-offs
are a consequence of poor managerial decision-making. Write-offs become inevitable actions for
companies that are suffering from a chain of management errors. Second, write-offs can be a re-
sponse by management proactively responding to negative shocks to the company. Even quality
managers that take calculated risks can have problems ex-post. Management consciously decides
to amend these problems by taking a write-off that also provides private information to the market
concerning the quality of the firm. Third, in companies with CEO turnover, write-offs can act as
a tool that allows the new CEO to get rid of bad accounts left by the previous CEO.

In this paper, I examine why companies take write-offs and how the market reacts to write-
off announcements; for this analysis, I use a carefully collected dataset of consumer manufacturing
companies, focusing on asset and lay-off based write-offs. I characterize what defines good and
bad write-offs, and analyze the characteristics of companies that take different types of write-offs.
Finally, I examine the shareholder wealth effects of write-offs, and whether firm specific factors
influence the market's reaction to the write-off announcement.

I find that the write-off decision is linked to industry shocks. Governance mechanisms also

affect the write-off decision. Companies with high pay-performance sensitivity, desirable board composition, strong shareholder protection measures, and CEO turnover resulting in an external replacement are all significantly correlated to a tendency to take write-offs. I find a negative relationship between governance quality and the size of write-offs, which suggests that poorly monitored companies wait to take write-offs and continue to accumulate problems. Eventually the problems become so large that a write-off is inevitable. Conversely, well-monitored companies take write-offs sooner. Since these companies act quickly, there is comparatively less that they can write-off, so the charges of well-monitored companies are less than the charges of poorly monitored companies. I also find that these well-monitored companies exhibit significant positive announcement effects (upwards of six percent for write-off companies with small boards, strong shareholder protection, and large percentage of outside directors. I conclude from these results that firms with effective monitoring mechanisms take value-enhancing write-offs.

The paper is constructed as follows. Section II reviews the relevant literature. I describe my sample in Section III. Section IV examines the link between CEO turnover, pay-performance sensitivity, corporate governance, and the write-off decision. Section V looks at how the market reacts to write-off announcements. Section VII concludes. Appendix A discusses the tax issues related to write-offs.

1.2 Literature Review

Other studies look at write-offs, but from different perspectives and with results that are not directly comparable to mine. The write-off literature focuses on three main areas, the effects of write-offs on returns, the relationship of earnings and write-offs, and the impact of SFAS 121 on write-off announcements. However, my primary focus is to explore the relations between the governance of a firm and the motivation to take write-offs as a business related decision.

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The first branch of literature, which looks at effects from write-off announcements, has mixed results. Some papers find that write-offs generate no abnormal returns, while others find that write-off announcements generate both positive and negative abnormal returns depending on the segmentation of the sample. Francis, Hanna, and Vincent (1997) collect and analyze write-offs from 1989 to 1992. Their analysis shows that on average the market views write-offs as negative news, although it is possible to explain some of the dispersion in market reactions by identifying different types of write-offs, such as inventory or restructuring. Their study provides evidence that both earnings management and asset impairment drive a write-off decision. Although Francis et al. use the same collection technique as I use, their sample spans fewer years, and contains fewer announcements. Their results motivate me to examine what role earnings management and asset impairment have in write-off decisions of good governance companies.

Meyer and Strong (1987) identify a sample of 78 write-off firms from the Wall Street Journal Index during 1981 - 1985. They construct a picture of a typical write-off firm; it has weak prior performance, changes in top management, and is highly leveraged. They also analyze announcement effects and report negative and insignificant abnormal returns, although the returns are widely dispersed. This paper relates to my study in that we both consider the impact of CEO turnover on a write-off decision, and it leads me to the yet untested hypothesis that the type of governance structure and CEO turnover affect the write-off decision.

Bartov, Lindahl, and Ricks (1998) use a key word search from Dow Jones News to compose a sample of write-off firms. They attempt to explain why the stock price changes around write-off announcements are so small relative to the average write-off amount. They suggest that the market under-reacts to the write-off announcement and find that abnormal returns are negative by as much as 21 percent after the announcement. Brickley and Van Drunen (1990) find a positive and significant average abnormal return around the announcement of restructuring charges. Kross, Park, and Ro (1996) also find a positive market reaction to the announcement of an initial re-

structuring charge, as well as increases in trading volume and market return variability. Alciatore, Easton, and Spear (2000) examine the timeliness of write-offs for oil and gas firms under the SEC's full-cost ceiling test. These authors find that write-offs have a significant negative association with contemporaneous quarterly returns and an even more negative association with prior quarter returns. They conclude that such impairments are not timely insofar as they are reflected in returns before the announcement of a write-off. Zucca and Campbell (1992) find no significant difference in stock performance from 60 days prior to 60 days after a write-off. Heflin and Warfield (1995) find that the returns for write-off firms during the write-off year are negatively correlated to the amount of the charge. These papers all focus on the abnormal returns associated with write-offs. They do not consider what motivates firms to take write-offs, and the relation between governance and write-offs, a main purpose of this paper.

Another branch of the write-off literature looks at the relation between write-offs, earnings, and performance. Kinney and Trezevant (1997) examine a large sample of Compustat data spanning the ten-year period 1981 through 1991 and find that write-offs are consistent with earnings management. They report that firms with large changes in reported earnings recognize significantly negative income from special items. This finding is consistent with dampening large increases to produce a smooth, upward trend in earnings. Elliot and Hanna (1996) study the information content of earnings conditional on the presence of write-offs. They also look at the incremental information content of these write-offs. Their main finding is a significant decline in the weight attached to unexpected earnings in quarters following write-offs. They conclude that this shows evidence that write-offs create noise in the information environment. These papers concentrate on how write-offs affect the information environment. They do not consider how endogenous factors such as corporate governance might affect the value of the information contained in the write-off announcements. My study adds to this branch of literature by examining how cross sectional characteristics (such as CEO turnover, governance provisions, and pay performance sensitivity) influence the information environment surrounding a write-off.

The last branch of literature is tied to the impact of FASB's 1995 issuance of SFAS 121, *Accounting for the Impairment of Long Lived Assets.* SFAS 121 was intended to reduce managerial flexibility and enhance the reporting of long-lived asset write-downs.[1] Kim and Kwon (2001) examine the difference in market reaction for early versus late adapters of the new FASB standard. They find that early adapters have a positive market reaction, but late adapters have a negative market reaction to a write-down announcement. Riedl (2002) compares the types of write-downs taken before and after SFAS 121. He finds that write-downs reported prior to the standard have a greater association to economic factors than do write-downs reported after the standard. Lindbeck, Rezaee, and Smith (1996) find that write-downs increase in magnitude following the adoption of SFAS 121. These papers all focus on one type of write-off and one main event, whereas my research covers a broader period, as well as a more extensive array of write-off types.[2]

1.3 Data

To generate my sample, I collect write-off information, focusing on announcement behavior between 1980 and 2000 made by companies in the 2000-2999 SIC code, which are primarily consumer manufacturing companies. I focus on this particular industry because it is a mature industry that is asset intensive, and therefore might have greater incentives to take write-offs compared to other industries. Using a CRSP generated perm and SIC code list, I search Lexis-Nexis and Dow Jones Retrieval services for specific key words. For each company, I search for articles that match key words. The key words I use are write down, write-off, restructure, charge against earnings, layoffs, and severance. When the query results in a match, I take the first article in the series of articles that refers to a current write-off that the company is announcing. I use the date of the article as

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[1]This standard addresses (1) the criteria for when to test for the existence of an impairment, (2) the level at which to group assets in testing for impairment, (3) the measurement basis for determining the existence of an impairment, (4) the measurement of the impairment, and (5) the presentation of the recognized amount. The standard only applies to write-downs.

[2]I test the robustness of my results for the impact of SFAS 121 in two ways. First, I segment my sample across time and do not find any significant changes in my analysis. Second, I remove the subset of write-downs from my sample, and find no significant changes to my analysis.

the announcement date of the write-off. I obtain the following information from the article: the amount of the write-off; whether the write-off was generated by an asset write-down, employee layoffs, or both; the purpose of the write-off (restructure, write-down, plant closing, etc.); the justification cited by the company; and whether the write-off amount is stated on a before-tax or after-tax basis. The sample contains asset-based and layoff-based write-offs. I find 2,429 companies within the consumer manufacturing industry. From this sector, 803 companies (33 percent) had a write-off, giving a combined 3,738 write-off announcements.

Write-offs represent either a write-down of assets, charge due to corporate restructuring, or charge due to lay-off events. SFAS 5 requires a firm to write down or expense asset values that will not be recoverable from future operations. SFAS 121 clarifies these circumstances for write-downs. SFAS 5 and APB Opinion 30 require firms to report restructuring charges, including charges from the sale or acquisition of a business in the year incurred. The disposition of a complete business segment must be reported as a separate line item called discontinued operations. Other write-offs can appear in the footnotes of financial statements. Appendix A provides a more complete explanation of the way write-offs are handled in financial reporting. In this study, I focus on write-offs that include the partial disposition of a segment, discontinued operations, restructuring charges, plant closings, costs of employee terminations, and other special charges that are either unusual or infrequent, but not considered an extraordinary item.

I do not include write-offs due to litigation costs, bankruptcy, goodwill, or capital structure refinancing in this data set. By including only write-offs that are related to operational decisions, I can examine the impact on future performance and avoid the legal and accounting peculiarities that are associated with other types of write-offs. Only write-offs that are announced singularly are included in the dataset, so that I can attempt to isolate both the reasons companies take write-offs and the market's reaction to the announcement.

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Although COMPUSTAT has data on write-offs, I opt to use the hand-collected data set for the following reasons. Information on write-offs can be found in Compustat data item #17. Compustat does not report charges that it deems inconsequential, but these can be important to establish a history of write-offs. Compustat also understates most write-offs. I compare the charge amounts listed in the write-off announcements to the charges recorded in Compustat. Overall, the public announcement of the write-off charge averages $3.41 million more than the COMPUSTAT write-off charges. All of the write-offs identified in COMPUSTAT are also listed in my sample, but there are 352 write-offs from my sample that are not listed in the COMPUSTAT sample. The differences in my sample versus COMPUSTAT are similar to the differences reported in an earlier study by Fried, Schiff, and Sondhi (1989).

To ensure that write-offs in my sample are not extensions of earlier events, I set an arbitrary standard under which I assume that any write-off announcements occurring within six months of earlier write-off announcements are related. This exercise is also performed for break off points of one month, three months, four months, eight months, and twelve months. Although doing so affects the sample size, it does not affect the analysis or findings. Therefore, I only describe results using the 6-month break point.

It is important to determine which write-off is a first-time event or a subsequent event. To define multiple write-offs, I need to establish an arbitrary time interval. The standard most researchers use defines multiple write-offs as any write-off event that occurs within 16 quarters of a prior write-off event.[3] To identify a company's first write-off, I look at all write-offs that occur during the first five years of the sample: 1980-1985. I require an initial period of 16 fiscal quarters with no write-offs before I add a firm to the sample. I denote the write-off following this break as a first time write-off. Because the original sample begins in 1980, the first reported write-off in the sample occurs in the first quarter of 1985. To test the sensitivity of this break point, I also

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[3]See Elliot and Hanna (1996).

use five other quarter break points to define first time write-offs, (8, 12, 18, and 20 quarters) to separate consecutive write-offs. My conclusions become more robust with the longer measures and weaken slightly with the short-term definitions. Since the inference changes only marginally, I use 16 quarters. This procedure leaves me with 767 firms and 1,798 write-off events to evaluate. After I identify the first time write-off for a company, write-offs that follow are labeled as second, third, fourth write-offs, etc. These subsequent write-offs must occur within 16 quarters after the prior write-off. If the write-off occurs after 16 quarters, I label it as another first time write-off.

To compare write-off company characteristics, I construct a sample of non-write-off firms. Out of the 2,429 firms in the 2000-2999 SIC codes for 1980-2000, there are 1,626 firms that do not have a write-off. I sort these non-write-off firms into their primary 4-digit SIC code. Each write-off firm in the sample is matched to at least two firms in the non-write-off group. This match is based on 4-digit SIC codes and similar total assets. If there are no firms that match the 4-digit SIC code of the identified write-off, I use the 3-digit or 2-digit SIC code. To match by size, I also pair write-off firms to non-write-off firms of similar total assets.[4] The matching results in a sample size of 2,037 write-off events composed of 767 write-off firms and 995 non-write-off firms.

Using the PERM numbers for my write-off sample, I merge COMPUSTAT and CRSP data into my sample. I measure the abnormal return measure as the market-adjusted returns. The reported results use the difference between daily CRSP returns and daily returns on the CRSP equally weighted market portfolio. I also use the value-weighted, beta-weighted, and market-capitalized CRSP market portfolios, and the results remain similar. I use the quarter prior to the write-off announcement to match COMPUSTAT data, such as book value, earnings per share, sales, shares outstanding, and total assets, for the write-off sample.

To calculate abnormal returns, I define the event window as the day of the write-off an-

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[4]I note that the non write-down firms have a total asset value that is at most 10 percent greater than the write-off companies are, or at most 10 percent less than the write-off companies.

nouncement in the financial press, which acts as the date in which the information concerning the write-off becomes public. I use the three-day horizon surrounding the announcement date ($t = -1$ to $t = 1$) to calculate the announcement effects. The abnormal return is the actual ex post return of the security over the event window minus the normal return of the firm over the event window (Brown and Warner, 1985). For any company i in month t,

$$AR_{it} = R_{it} - E(R_{it}), \tag{1.0}$$

where R_{it} is the realized return on day t, and E is the expectations operator. I estimate the expected return $E(R_{it})$ for each firm as the return on equal-weighted size portfolio model. I estimate the average abnormal return $(\bar{A}_{it})$ for each day in the sample as follows:

$$\bar{A}_{it} = 1/N \sum_{i=-1}^{N} AR_{it}, \tag{1.1}$$

where N is the number of securities. $\bar{A}_{it}$ is a cross sectional average.[5]

Table 1, Panel A shows the distribution of write-offs over the 16-year sample period. The sample contains 604 pure asset related transactions, 1,175 write-offs that combine both assets and layoffs, and 258 write-offs related to lay-offs. The number of write-offs per year triples from the beginning of the sample (49 in 1985 to 212 in 2000). Panel B of Table 1 shows the frequency of write-offs by firm from 1985-2000. Out of the 767 firms that take one write-off, 61 percent take an additional write-off, and 42 percent have at least two additional write-offs.

Table 2 describes the write-off sample. Restructures are by far the most common type of event, occurring in more than 56 percent of write-off incidents. Discontinued operations are the second most common write-off event, occurring 14.28 percent of the time. The table also displays the average charge for each type of write-off. Partial asset write-downs, and restructuring charges have

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[5]I also calculate returns using the market model, with an estimation period of -90 to -61 days before the write-off announcement. I choose the estimation period to minimize the problems associated with estimating parameters with data influenced by the write-off event. The results are comparable to the reported results.

the greatest magnitudes, averaging $78 million and $72 million, respectively. Write-off amounts range from $56 thousand to $2.1 billion, with a mean of $45 million. The distribution is positively skewed; the median write-off is $22 million. This skewness is also observed for each write-off category. The table also shows the average write-off charge total assets (TA). When adjusted by BV and TA, discontinued operations-based write-offs are the largest, followed by restructure-based write-offs. On average, discontinued operations charges are over 13 percent of a write-off firm's total assets. Restructuring charges were second with charges over 6 percent of a write-off firm's assets. The total amount of firm value written off over the sample amounts to over $98 billion dollars. Due to the potential shareholder welfare implications from a loss this large, it is important to understand the cross sectional characteristics of write-off companies, and the resultant impact on shareholder value.

Table 3 describes the mean and median of firm specific variables used in subsequent probit models. I also report univariate significance tests to determine whether there is any difference between the write-off values and the non write-off values. The variables shown in the table include:

- MV = the size of the firm, measured as the log of market value one quarter before the write-off was announced.

- SHROWNPC = the percent of the new (if replacement) or old (if not replaced) stock holdings in the company for the CEO.

- SALARY = the dollar salary of the CEO in the year of the write-off, in 100k.

- BONUS = the dollar bonus for the CEO in the year of the write-off, in 100k.

- OPTIONS = the aggregate dollar value of all options granted to the executive during the year as valued by the company, in 100k.

- SIZEBD = the number of directors, both inside and external.

- PER_OUT = the percentage of directors who have no relationship with the company.

- DIROPT = the number of options, which each non-employee director received during the year in thousands.

- DIRSTK = the number of shares, which each non-employee director received during the year in thousands.

- GOV_INDEX = Governance index, the lower the number the better the shareholder protection, the higher the number, the worse the managerial entrenchment. This index is based on charter provisions listed by IRRC publications

- DOLLAR_SENSITIVITY = the dollar sensitivity of compensation to performance.

- RETURN_SENSITIVITY = the return sensitivity of compensation to performance.

- ROA = the return of assets for the current quarter.

Firm size is related to the likelihood of write-offs occurring, as discussed in Meyer and Strong (1989). The larger the firm, the more assets it can divest. Table 3, Panel A, shows that non-write-off firms have the lowest market value, with an average MV of $191 million. One-time write-off firms are on average $15,367 million, and are significantly larger than the benchmark (significant at 5 percent), while multiple write-off firms are the largest with a market value of $ 265,667 million (significant at 5 percent).[6] One-time write-off executives own four percent of their company's stock, followed by multiple write-off firms at three percent, and then non-write-off firms at two percent. Only one time write-off company CEOS have significantly different stock ownership as compared to the benchmark (significant at 10 percent). I find that CEOS of the one-time write-off firms and the multiple write-off firms are paid $666 thousand, and $629,000 respectively, which is less than non-write-off CEOs pay, $657,000. Likewise, non-write-off firms receive larger dollar bonuses than write-off firms ($848,000, $534,000, and $548,000 on average for non write-offs, one-time write-offs, and multiple write-offs, respectively). First-time write-off firms have option grants of $2,385,000, which are the highest value of option grants, followed multiple at

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[6]All of the *t*-values presented test for whether there is a significant difference between the write-off firms and the benchmarks.

$2,039,000, and non write-off firms,$1,346,000. First-time write-off firms have the smallest boards, with 10.17 members, followed by multiple, and non write-off firms (11 members, and 12 members respectively). Indeed, not only are the boards smaller for write-off firms, but they are also dominated by outsiders (76 percent, for multiple write-off firms, 73 percent for first-time write-off firms, and 69 percent for non-write-off firms. These results suggest that the boards of write-off firms are better monitors than are the boards of non-write-off firms. GOV_INDEX, a measure of the level of shareholder protection measures from the IRRC database, show moderately stronger protection measures for write-offs as compared to non write-off firms. The first time and multiple write-off companies show an average ROA of 4.25 percent and 4.7 percent, respectively and are both significantly less than the benchmark firm's ROA of 7.3 percent.

I measure pay-performance sensitivity in two ways. The first measure is the dollar sensitivity of CEO compensation, defined as the change in the dollar value of the CEO's stock and option holdings for a dollar change in firm equity value. The second is the change in the dollar value of the CEO's stock and option holdings for a one percent change in a company's stock price (the return sensitivity). Baker and Hall (1998) argue that the return sensitivity measure is the appropriate one to use when CEO actions affect firm percentage returns through their control of firm strategy. I calculate these measures using the Core and Guay (1999a, 1999b) method, which allows me to compute incentives using the one-year data on a CEO's stock option portfolio contained in the annual proxy statements. I estimate the regressions using both measures of incentives and find similar results. Pay-performance sensitivity is defines as follows, where W denotes CEO wealth in options and stocks held, and V denotes firm value,

$$ReturnSensitivity = r = 0.01 * dW/(dV/V)$$

and

$$DollarSensitivity = (dW/dV) = 100 * r/V. \tag{1.2}$$

These ratios act as proxies for the degree of pay-performance sensitivity of a CEO. This sensitivity shows the percentage by which pay increases (decreases) when company performance increases (decreases) by one percent. Table 3 shows the summary of these two sensitivity measures. First-time write-offs show the greatest sensitivity, followed by multiple and then non-write-off firms.

In addition, I calculate the TLCF, the tax-loss-carry-forwards of the company, in the write-off quarter.[7] Two possible relationships between TLCFs and write-offs are if a company has had prior poor performance, it is possible that they have had a tax-loss-carry-forward, and the TLCF would act as a proxy for poor performance, which would lead to a positive relationship with write-offs. Second, if the company already has a TLCF, there are fewer tax incentives to take a write-off, and so one would expect a negative relationship between write-offs and the TLCF. In this paper, TLCF is a dummy variable that is one if the company has an unused tax-loss-carry-forward, and zero otherwise. I also calculate the debt ratio, DEBT_RATIO, defined as total debt over total assets. I expect that due to tax incentives, there will be a negative relationship between write-offs and debt. If a company has more debt, it has the tax shelter from the interest expense, which would offset a tax advantage from taking write-offs.

Table 3, Panel B, shows the governance characteristics broken up by year. This table includes all firms in the sample over all years of the sample, regardless of whether the firm took a write-off in that particular year. There is very little change in the governance variables from year to year. Since the governance variables are sticky, they act like firm specific effects in the following regressions. Since there is very little change in board size, percent of outside directors, and the IRRC index over time, these variables can be considered given; that is, they are determined outside the write-off decision and are not impacted by short term changes in performance. However, CEO turnover does present a self-selection issue in relation to the write-off decision and performance changes.

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[7]See Plesko (1999) for a description of the calculation of the TLCF.

1.4 Characteristics of Write-off Companies

Companies with effective monitoring mechanisms are not immune to problems. Certain circumstances, such as negative economic shocks, or increased product market competition can negatively affect the company's performance. However, these well monitored companies quickly recognize the problems and take actions to fix the problem areas.[8] This argument suggests that good governance firms have smaller multiple write-offs, while poorly governed companies have fewer, but much larger write-offs. One would then expect to see a positive correlation between governance quality and the probability of taking write-offs, and an improvement in future earnings for the write-off company.

In this paper, I look at how four factors might affect the write-off decision, and influence short run consequences or long run benefits. These factors are CEO turnover, pay-performance sensitivity, board composition, and managerial entrenchment. I first test each hypothesis individually to see how the firm characteristic is related to the write-off decision and then examine the hypotheses jointly to see how the characteristics interact in relation to the write-off decision.

1.4.1 Corporate Cleanup Hypothesis

Borokovich, Parrino, and Trapani (1996) show that a turnover announcement is normally succeeded by a positive market reaction for outside replacement, and a negative reaction for insider replacement, especially when the replacement is not voluntary. Prior corporate governance research also emphasizes that a critical element of corporate governance mechanisms is an ability to identify and terminate poorly performing executives (Kaplan (1994); Coffee (1999); Murphy (1999); Volpin (2002); Berger, Ofek, and Yermack (1997)). For example, Macey (1997) observes that a necessary

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[8]See, e.g., Paul (2003), which describes how all managers make mistakes, but that companies with good governance are the first to correct these mistakes.

condition for competent corporate governance systems is the removal of poorly performing managers. Gibson (1999) asserts that a primary purpose of corporate governance mechanisms is to ensure that poorly performing managers are removed. The importance of replacing unfit CEOs is also consistent with Shleifer and Vishny (1989, 1997), who speculate that the most important form of managers expropriating shareholder wealth are unqualified managers who remain with the company. Jensen and Ruback (1983) also support this position by arguing that poorly performing managers who resist removal might be the costliest manifestation of the agency problem.

Whether CEO replacement is external or internal could also affect the write-off decision. An external replacement would be more likely to result in a write-off than an internal replacement. An external replacement typically indicates different agenda for the company, which can result in the new CEO cleaning up the internal problems prior to pursuing new goals. An internal replacement is a part of the earlier CEO's agenda and has less incentive to take a write-off. In addition, if the new CEO expects to remain in place for a longer horizon, then she has an incentive to see the company's profitability to improve in the long term. Formally stated:

H1:(Corporate Cleanup Hypothesis) The probability of a write-off is greater for firms that have recently had CEO turnover, especially if the replacement is external .

Table 4 Panel A shows the characteristics of executive turnover associated with a write-off announcement. I obtain my turnover data from Execucomp. After matching the two datasets, my combined sample comprises of 886 write-off events for the 1992 to 2000 period. I label CEO replacement that occurs within a year prior to the write-off announcement as a related event. Execucomp lists the reason the CEO leaves the company. If applicable, I mark one of the following options: resigned, retired, deceased, or unknown. The table shows two types of turnovers, those with external replacements, and those with internal replacements. I define a replacement as external or internal by comparing the date the CEO entered office and the date the CEO joined the

company. If these coincide, the CEO is external, otherwise internal.

Table 4 Panel A describes the turnover statistics for non write-off, first-time write-off, and multiple write-off firms. Non-write-off firms have less CEO turnover than do one-time write-off firms, or multiple write-off firms. There are 130 CEO turnovers for multiple write-off companies, 59 for one-time write-off companies, and only 35 for the benchmark companies over the eight years of the sample. The majority of replacements came from outside the company (65 percent, and 81 percent, and 77 percent for multiple, first, and non write-off firms respectively). These results suggest that there is a link between write-offs and turnover.

As discussed above, the firm that decides to terminate its CEO may do so because of unobserved information that is potentially concealed with the information that leads to a write-off. This leads to self-selection in the CEO turnover decision. In order to control for this source of self-selection bias, I run a two-stage sample selection model. In the first stage, I run the following probit estimate:

$$pr(EXTURNOVER) = \beta_1 + \beta_2 LOGMV_i + \beta_3 ROA_i + \beta_4 R_i + \epsilon_i, \tag{1.3}$$

where EXTURNOVER is a dummy variable that is equal to one if there was CEO turnover with an external replacement, and zero otherwise. R , the unadjusted cumulative monthly stock return for the firm over the past 12 months, is the independent variable, which measures CEO performance . The specification follows Parrino 1997. Table 4 Panel B gives the results of the estimate. Consistent with prior work, I find that the probability of forced CEO turnover is estimated to be negatively and significantly related to the prior stock return. ROA shows the accounting profitability of the firm one year prior. ROA, and the log of market value are also negatively related to EXTURNOVER. The results are similar to those represented by Parrino (1997).

In the second stage, I model the decision to take a write-off using a probit model. A firm

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takes a write-off if latent variable WO$\geq$ 0 and no write-off if WO $\leq$ 0. WO_i is empirically specified as:

$$pr(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 SHROWNPC_i + \beta_4 CEO\_OUT + \beta_5 ROA+$$

$$\beta_6 TLCF + \beta_6 DEBT\_RATIO + \gamma_i, \tag{1.4}$$

where γ_i is standard normal. CEO_OUT is the inverse mills ratio from the CEO turnover probit equation and it corrects for the self-selection in the decision to replace the CEO. ROA is return on assets, TLCF is a dummy variable that is one if a company has tax-loss-carry-forwards, and DEBT_RATIO is the debt ratio. and γ is a standard normal error term.

Table 5, Model 1, shows the probit results for Equation (1.4). I find that the probability of a write-off occurring increases if a CEO turnover with an outside replacement occurs within the one-year period prior to the write-off (significant at 5 percent). The control variables in Equation (1.4) have the right signs. The results confirm a significant positive relation between the probability of a write-off and the size of a firm. There is a negative correlation between performance and the write-off decision. ROA is negatively related to write-offs, while TLCF is positively related to write-offs. I also find that CEO shareholdings are related to the write-off decision, despite the fact that the CEO turnover and the percent ownership are strongly negatively related. In addition, debt is negatively related to the write-off decision. Table 6, Model 1, shows the marginal effects for the probit model. The share ownership, the size, and CEO replacement from outside the company have the largest impact on the write-off decision, respectively. In another words, the larger the firm, the more likely it is that it will take a write-off. The impact of firm size on the write-off decision is similar to the results in Meyer and Strong (1989). In addition, the results are consistent with companies undergoing a period of poor performance. These results are robust to time period specific random effects.

1.4.2 Executive Compensation and the Write-off Decision

It has become common practice for executive compensation to be tied to the company's performance. Coughlan and Schmidt (1985), Murphy (1985, 1986), Abowd (1990), Jensen and Murphy (1990) and Leonard (1990) study the relation between executive compensation contracts, incentives and firm performance. These papers show that firm performance is largely positively related to pay-performance sensitivity, after controlling for the risk, i.e., the variance of performance (Aggarwal and Samwick, 1999). Audt, Cready, and Lopez (2003) find that after controlling for the growth in annual inflation adjusted CEO cash compensation, CEOs are not protected from the adverse effects of charges on earnings on their own utility.

If a CEO's actions are closely tied to firm performance, then the CEO will hesitate to take unnecessary actions that affect his compensation. Therefore, it is plausible the CEOs with high pay performance sensitivity will not take a write-off unless it is necessary to improve future performance. There is a trade-off between short-term and long-term utility for the CEO. In the short term, write-offs can reduce stock price, which can reduce compensation. In the long term, write-offs can improve future performance, which can increase compensation. The future benefits would dominate if there were a longer horizon for the CEO (e.g. for a new CEO), or compensation is more dependent on future performance (e.g. stock options).

Formally stated:

H2:(Executive Compensation Hypothesis)The probability of taking a write-off is positively related to the pay-performance sensitivity of a CEO. The probability of taking a write-off is also positively related to the actual compensation package.

To test this possibility, I use two different measures of compensation: actual compensation, and pay-performance sensitivity. I use the following probit model to test hypothesis H2. I observe a write-off is one if latent variable WO$\geq$0 and no write-off if WO $\leq$ 0. WO$_i$ is empirically specified

as:

$$pr(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 SALARY_i + \beta_4 BONUS_i + \beta_5 SHROWNPC_i + \beta_6 OPTIONS_i$$

$$+\beta_7 RETYRS_i + \beta_8 ROA_i + \beta_9 TLCF_i + \beta_{10} DEBT\_RATIO_i + \epsilon_i, \qquad (1.5)$$

where ϵ_i is standard normal. I control for the size of the company and the tenure of the CEO (RETYRS), as well as performance. I expect that higher compensation will be positively related to write-offs. I also expect that the tenure of the CEO will be negatively related to write-offs. This could be either because the CEO is entrenched, or because the CEO has not made any mistakes and has no need for write-offs.

Table 5, Model 2 (A), shows the estimates of Equation (1.5). CEOs with lower salaries are more likely to take write-offs than are CEOs with higher salaries (coefficient = -0.001, significant at 5 percent), and CEOs with a greater percentage of shares are more likely to take write-offs (coefficient = 4.23, significant at 5 percent). These results suggest that compensation packages, which tie CEO incentives to performance, are related to write-offs. The control variables in Equation (1.5) have the right signs. The market value of a firm is positively related to the write-off decision, while the tenure of a CEO is negatively related to the write-off decision. ROA is negatively related to write-offs and TLCF is positively related to write-offs. In addition, the debt ratio is negatively related to the write-off decision. These results suggest that CEOs who are less entrenched are more likely to take write-offs.

As discussed above, the pay-performance sensitivity might have implications in a write-off decision. By using the following probit model, I test whether the pay-performance sensitivity of managers and the level of entrenchment affect a company's write-off decision. I observe a write-off is one if latent variable WO$\geq$0 and no write-off if WO $\leq$ 0. WO$_i$ is empirically specified as:

$$pr(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 INTERLOCK_i + \beta_4 RETYRS_i + \beta_5 PPS_i + \beta_6 ROA_i$$

$$+\beta_7 TLCF_i + \beta_8 DEBT\_RATIO + \epsilon_i, \tag{1.6}$$

where ϵ_i is standard normal and PPS is the degree of pay-performance sensitivity. I run the regression using both dollar and return sensitivity as a measure of PPS, as discussed in Core and Guay (1999a, 1999b). INTERLOCK is a dummy variable equal to one if the management is entrenched and zero if it is not, as defined by Execucomp. Entrenchment generally involves one of the following situations: the officer serves on the board committee that makes his compensation decisions, or serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the compensation committee of the indicated officer's company. Hallock (1997) describes the use of this variable as a proxy for managerial entrenchment. RETYRS is the number of years the CEO has been in office. I expect that INTERLOCK and RETYRS will be negatively related to write-offs.

Table 5, Model 2 (B) shows the estimate of Equation (1.6) for the period 1990-2000. The results indicate a positive relation between the probability of a write-off and the pay-performance sensitivity of the CEO(t-value = 1.95, significant at 10 percent).[9] As before, the control variables in Equation (1.6) have the right signs. Market value, and TLCF are positively and significantly related to write-offs, while the entrenchment variable, debt ratio, and ROA are negatively related to write-offs. Table 6, Model 2 (B), shows the results of the marginal effect of the probit estimation.

1.4.3 Monitoring Mechanism Hypothesis

The board of directors decides on both CEO compensation packages, and CEO turnover replacements. In addition, the board of directors acts as a monitoring mechanism for CEOs. If the board

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[9]Table 5 shows the estimation for the return sensitivity measure. Results for the dollar sensitivity measure were comparable.

is a proficient monitor, then there are fewer agency issues with management and the CEO has better incentives to take actions that benefit the company and shareholders. When non-performing assets affect a company, then a write-off is a tool that management can use to alleviate these operational problems. If a link exists between performance and monitoring mechanism quality, then it is plausible that companies with boards that are good monitors will have a higher probability of taking a write-off.

The governance literature finds strong evidence that board composition (size of board and percentage of insiders on the board) is related to the degree of agency problems (Byrd and Hickman (1992); Wasatch (1988); Borokovich, Parrino, and Trapani (1996); Bhagat and Black (1999); Core, Larcker, and Holthausen (1999); Hermalin and Weisbach (1991); and Yermack (1996). Larger boards with more inside directors tend to have more agency problems. Conversely, firms with small boards and a high percentage of outsiders will be more concerned about shareholder welfare and firm performance.

Formally stated:

H3: The probability of a write-off increases when there are quality governance mechanisms in place (Monitoring Mechanism Hypothesis).

The size and percentage of outsiders on the board act as proxies for monitoring quality. I also include the number of options and the percentage of equity that the directors own. If the board's compensation is attached to the performance of the company, the incentive to be quality monitors increases, as discussed in Mayers, Shivdasani, and Smith (1994). I also include the governance index, GOV_INDEX. Gompers, Ishii, and Metrick (2003) create a governance database drawn from Investor Responsibility Research Center (IRRC) publications, an organization that has tracked the provisions for about 1,500 firms per year since 1990. I merge the write-off sample to the governance database using ticker symbols and year. G A higher GOV_INDEX indicates a

firm with less shareholder rights. GOV_INDEX was available for 756 write-off events.

Following Hypothesis 3A, I estimate the following probit specification:

$$pr(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 SIZEBD_i + \beta_4 DIROTP_i + \beta_5 GOV\_INDEX_i + \beta_6 PERC\_OUT_i$$

$$+\beta_7 DIROSK_i + beta_8 ROA_i + \beta_9 TLCF_i + \beta_9 RETYRS_i + \beta_{10} DEBT\_RATIO + \epsilon_i, \qquad (1.7)$$

where SIZEBD is the size of the board of directors, PERC_OUT is the percent of outside directors, GOV_INDEX is the degree of shareholder protection, DIROPT is the value of options owned by the directors, and DIROSK is the percent stock ownership of the directors. Since

Table 5, Model 3, shows the results of the test for whether better monitoring boards are more likely to take write-offs. The results indicate that boards that are more independent have a greater likelihood of taking a write-off. SIZEBD is negatively related to the probability of a write-off (significant at 5%), and the percentage of outsiders is positively related to the probability of a (write-off significant at 5%). GOV_INDEX is negatively related to the probability of taking a write-off (significant at 5%). The percent of directors' option ownership is positively related to the likelihood of a write-off, while the number of shares is not significantly linked to the tendency to take write-offs. These results suggest that firms with smaller boards, more outside directors, and shareholder protection are more likely to take a write-off. The coefficients of the control variables are consistent with the expected signs. The market value of the company (SIZE), and TLCF are positively related to the write-off decision, while ROA, debt ratio, and RETYRS are negatively related to the write-off decision. The signs and significance of ROA and TLCF are consistent with companies having poor performance both in the write-off quarter, and in recent past quarters. The options owned are positively related to the tendency to take write-offs, while the percent stock ownership is negatively related to the tendency to take write-offs. Table 6, Model 3, looks at the marginal effects of the independent variables on the write-off decision. Overall, these results con-

firm that companies with desirable board composition and strong shareholder protection measures have a tendency to take write-offs.

1.4.4 Multivariate Analysis

In the previous sections, I test the one-on-one relations between CEO turnover and write-offs, pay-performance sensitivity and write-offs, board composition, shareholder protection, and write-offs. In this section, to examine the interaction of the independent variables, and to test which characteristics are of the most importance, I combine these separate specifications.

In addition to firm characteristics described above, I include an industry shock variable. Industry shocks and recessions are two possible factors that can affect a write-off decision. By including these variables in the probit estimation, I can test whether these factors are related to the write-off decision.

Using the Bartelsman and Gray (2002) dataset on the NBER website, I create a measure of industry demand. I use the industry shipments at the 4-digit SIC code level deflated by a 1987 industry price deflator, and then aggregate this data at the 3-digit SIC code level. I detrend the data by regressing the actual value of industry shipments on a yearly time trend variable. I then calculate the industry shock is then calculated as the difference between the predicted and the actual value of shipments. I use the detrended real industry shipments for the same reasons cited in Maksimovic and Phillips (2002). The reasons include the growth of an industry, which affects the value of the capital in the industry, and firms' cash constraints can depend on industry conditions.

To test whether the market's reaction to the write-off is influenced by the relationship between productivity and segment growth, I create dummy variables for recessionary and expansionary periods. I also classify years as recession or expansion years for an industry, and determine

the recession and expansion years by looking at the relationship between the aggregate, and the aggregate detrended production in each industry. If these two variables are negative, then the year is a recession year. If they are both positive, it is an expansion year. Detrended production is the actual production minus the predicted production, where the predicted production is calculated as the production regressed on a time variable.

Table 5, Model 4, looks at the results of the following two regressions, which examine the combined impact of the firm quality characteristics while controlling for industry effects.

$$P(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 SHOCK_i + \beta_{4-8} GOVVARS_i + \beta_{9-12} CONTROLVARS_i + \epsilon_i, \quad (1.8)$$

$$P(WO) = \beta_1 + \beta_2 SIZE_i + \beta_3 RECESSION_i + \beta_4 EXPANSION_i + \beta_{5-9} GOVVARS_i$$

$$+ \beta_{10-13} CONTROLVARS_i + \epsilon_i, \quad (1.9)$$

where GOVVARS are CEO turnover with external replacement(using IMR to control for endogeneity), pay-performance sensitivity, board size, percent of outsiders on the board, and shareholder protection. I also include several control variables, such as percent of shares owned, RETYRS, CEO tenure, ROA, TLCF, and an interlocking relationship dummy.

The results in Table 5, Model 4 show that if a negative shock affects the firm, the probability of a write-off increases, especially when I control for governance quality (significant at 5 percent). Likewise, a recession year for the company increases the probability of a write-off occurring (significant at 5 percent), while an expansion year is negatively related to the write-off decision. Equations (10) and (1.9) permit me to simultaneously examine the impact of the firm characteristics on the write-off decision. Shareholder protection, board size, and percent of outside directors continue to remain significant. CEO turnover, and pay-performance sensitivity do not have as significant a role when combined with the other governance factors. One reason pay-performance sensitivity

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may not be significant is because GOV_INDEX encompasses compensation plans.

These results suggest that well governed companies that operate in industries impacted by negative shocks or recessions have a tendency to take write-offs. Table 6 shows the marginal effects for the combined probit estimation of Model 4 (A) and (B). I find that for the independent variables conditional on the write-off decision, the number of outsiders on the board and the size of the company have the greatest impact on the write-off decision. The size of the board and the level of shareholder protection also have a highly significant effect on the probability of a write-off.[10]

1.4.5   Weak Shareholder Protection and Write-offs

So far, I have found evidence that companies with strong monitoring mechanisms have a tendency to take write-offs. However, these results do not answer any questions about weakly monitored companies. It seems plausible that there is also a link between weak monitoring mechanisms and write-offs. Companies with less effective governance structures continually collect problems and only take write-offs when there is no other alternative. An example of a poor governance company and write-offs is Tyco Corporation. In an effort to hide slowing growth in its core divisions, Tyco kept on diversifying into new areas. These diversification strategies were not successful, and so it would diversify into yet another area. Eventually the problem became so huge that Tyco was left with little alternative other than to take a write-off (Symonds, 2002).

I first determine firms with weak shareholder protection measures that take write-offs. I break the sample into three segments: weakly monitored governance companies, neutral governance companies and strong governance companies. I break the sample into three categories based on their GOV_INDEX. I sort the sample by GOV_INDEX and label the lowest 10 percent of the sample well monitored, and the top 10 percent weakly monitored companies. Table 7, Panel A

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[10]I also include the industry effects in this estimate, but do not find any significant results. This is because I only focus on one main industry - the consumer-manufacturing sector.

shows the results of this segmentation. The *t*-values test for whether there is a difference between the average sizes of good versus bad governance characteristics. It becomes evident that there is wide dispersion between the write-off firms in the sample, based on governance. The weakly monitored companies have an average board of 18 people versus the good governance companies with an average board size of six people (significant at five %). In addition, the poorly monitored companies have significantly fewer outsiders on the board, and have significantly worse shareholder protection measures (*t*-value=2.98 and 2.31, respectively.)

To formally test whether there is a relationship between poor governance and write-offs, I isolate worst 50 percent governance firms in my sample, both write-off firms and benchmarks, based on GOV_INDEX. To do so, I sort the sample based on the GOV_INDEX, and then drop the top 50 percent governance firms in the sample. I then re-estimate Equation (10) with only the bad governance firms. Table 7, Panel B, shows the results. The most important factors in determining whether bad governance companies take write-offs are shareholder protection measures, and board size. Both GOV_INDEX and BDSIZE are positively and significantly related to the write-off decisions. The other governance variables show the predicted signs but are not significant. The control variables show the predicted signs discussed in earlier sections.

1.4.6   Governance and Size of Write-offs

I have found evidence that suggests both well and poorly monitored companies are subject to write-offs. Even the best corporations are not immune from mistakes. However, these good governance companies quickly recognize the mistake, and take actions to repair the problem. If this is true, then it is expected that write-offs would be relatively small for these quality companies. Poorly monitored companies, on the other hand are slow to admit to mistakes, and even slower to take actions to improve the situation. They collect mistakes until it becomes inevitable that a write-off should occur. Following this argument, it is plausible that poorly monitored companies

will have relatively large write-offs.

In this section, I test whether the size of a write-off is influenced by the quality of the governance. If this is the case, then it supports the story that well governed companies are first to repair problems, whereas poorly monitored companies are reluctant to repair problem areas. Table 8, Panel A, shows the univariate results of write-off size, segmented by write-off quality. I segment the sample into three different groups: companies with weak monitoring structures, companies with average governance, and companies with strong governance. I sort the companies on the following items: GOV_INDEX, board size, and percent of outsiders. I denote weak as the bottom 10 percent of write-offs, and strong as the top 10 percent of write-offs. I adjust write-offs by the total assets of a company. The average size of all write-offs is 0.03. The average adjusted size of well-monitored companies' write-offs is 0.02, versus 0.06 for poorly monitored companies. I regress the size of the write-off on the following Equation to test whether governance affects write-off size:

$$WO/TA = \beta_1 + \beta_{2-5}CONTROLVARS_i + \beta_{5-10}GOVVAR_i + \epsilon_i, \qquad (1.10)$$

where GOVVARS are CEO turnover with external replacement, pay-performance sensitivity, board size, percent of outsiders on the board, and GOV_INDEX. CONTROLVARS are MV, ROA, and TLCF.

Table 8, Panel B, shows the results of this regression, which controls for heteroscedascity in standard errors. The results suggest that companies with larger boards take larger write-offs (t-value = 2.76). Likewise, companies with more outside directors also take larger charges (t-value = 1.98). Although not significant, the results also suggest that companies with worse shareholder protection measures and lower PPS also take larger write-offs. These results show that companies with worse governance take larger write-offs, while good governance companies take small write-offs. The control variables show the expected relationship to write-offs. These results are consistent with the story that good governance companies are first to act when problems arise,

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hence the size of the write-off is smaller. Bad governance companies wait to take write-offs and collect problems over an extended period, hence the size of the write-off is comparably larger.

1.5   Market Reaction and Write-off Announcements

Having shown that corporate governance impacts in what manner write-offs are used, I now examine how investors react to write-offs, taking into account the quality of governance of the announcing company.

Table 9 looks at the abnormal returns surrounding the write-off announcement for the one-time and multiple events, and for the combined sample. For the full sample, the average market reaction to write-off announcements is -1.10 percent, and is not significant. These findings are comparable with those in earlier studies, e.g. Meyer and Strong (1987), Elliot and Shaw (1988), Bartov, Lindahl, and Ricks (1998). When looking at the pooled average of 15 years, only one-time write-offs show any significant abnormal returns. The one-time write-offs display a significant -1.82 percent return around the announcement day (significant at 5%). I interpret this result as meaning that the market only considers first-time write-offs to be significant to the company's performance.

I look at the combined impact of CEO turnover, pay-performance sensitivity, and board composition on the announcement effects of write-off firms:

$$AR_i = \beta_1 + \beta_2 SIZE_i + \beta_3 SIZEBD_i + \beta_4 PERC\_OUT_i + \beta_5 CEO\_OUT_i$$

$$+\beta_6 RECESSION_i + \beta_7 PPS_i + \beta_8 ROA_i + \beta_9 WO\_TA_i$$

$$+\beta_{10} WO\_\#_i + \beta_{11} TYPE_i + \beta_{12} DEBT_i + \beta_{13} GOV\_INDEX_i + \epsilon_i. \qquad (1.11)$$

In addition to the governance variables I have used for the probit estimates, I include the

size of the write-off (WO_TA), the type of write-off and the number of write-offs a firm has taken ($WO\_\#$), which includes the current write-off (a first time write-off would be equal to one, etc.). I would expect that larger write-offs would have a more negative impact on returns. In addition, I expect that companies with less write-off history will see a greater market reaction and stronger monitoring mechanisms will lead to higher returns.

Table 10 shows the results of these estimates. I find that when controlling for negative industry shocks such as recession, companies with strong governance measures actually experience more positive abnormal return. Larger firms have a 0.2 percent increase in abnormal returns. Strong shareholder protection leads to a 2.4 percent increase in abnormal returns. Small boards lead to a 1.5 percent increase in abnormal returns. A larger percentage of outside directors leads to a two percent increase in abnormal returns, while high PPS leads to a 2.6 increase in abnormal returns. CEO turnover leads to a 0.2 percent increase in abnormal returns. However, larger write-offs lead to a one percent drop in returns. The debt ratio, the type of write-off, and the number of write-offs. In aggregate, companies with strong monitoring mechanisms have over 6 percent abnormal returns following a write-off announcement.

Next, I consider companies with a write-off following CEO turnover. As Borokovich, Parrino, and Trapani (1996) show, the turnover announcement is normally succeeded by a positive market reaction for outside replacement, and a negative reaction for insider replacement when the replacement is not voluntary. These results give evidence that the market differentiates between inside and outside replacement, and that outside replacement are good for the future of the firm. Hence, I test whether write-offs generate similar reactions. Are write-offs from CEO turnover where the replacement is external associated with positive announcement day effects, or is the write-off anticipated following the turnover? Table 11 segments the write-off announcement effects by CEO turnover, and GOV_INDEX. I find that there is more than a 6 percent positive write-off announcement return for good governance companies that have had a recent CEO turnover using

an external replacement. These results suggest that an investor who owns a write-off company, which has good governance and recently had a CEO turnover could make a six percent return over the market.

1.6   Conclusion

This paper examines the relation between write-offs and corporate governance measures. Companies that have smaller boards with a higher percent of outside directors, stronger shareholder protection measures, high pay-performance sensitivity, or CEO turnover are positively related to the write-off decision. The write-offs these good governance companies take are linked to industry specific factors, such as industry shocks, or recessions. By segmenting out the good governance companies from the sample, I am able to test whether there is a link between poor governance and the write-off decision. I find that companies with poor shareholder protection measures, and large boards are also positively related to the tendency to take write-offs. In addition, lower quality governance leads to larger write-offs. Well-monitored companies are the first to act when they realize that a problem has arisen and write-offs are one tool that management can use to clean up the problem area. Conversely, poorly monitored companies wait to amend the companies' problems, until the magnitude of the problem cannot be ignored. This explains why the size of the write-offs from poorly monitored companies is significantly larger than the size of write-offs from well-monitored companies.

I also look at the impact of write-offs on investors. By segmenting the write-offs based on the governance quality, I determine whether investors differentiate between the different companies taking write-offs and the types of write-offs. It becomes evident that companies with quality monitoring mechanisms take write-offs that result in a positive stock market reaction, while companies with poor monitoring mechanisms take write-offs that result in a negative stock market reaction. The findings suggest that investors may understand the information content in write-

offs, and are able to differentiate between write-offs that will improve performance and write-offs that will not. The stock market recognizes the quality of management and the board of directors and an investor's reaction is based on this knowledge. By looking at the cross-sectional dispersion of governance measures and based on the quality of the monitoring mechanisms, an announcement day effect could have more than a six percent positive return in the short term. The evidence in this paper indicates that companies with good governance use write-offs in a way that is consistent with enhancing shareholder value. In addition, I find evidence that is consistent with the idea that governance matters.

1.7 Tables

Table I   Sample Information

Panel A shows, by year, the number of write-off announcements for layoff based, asset based, and combined write-offs. Panel B shows the number of firms in the sample that take a first time write-off and then breaks into the percent of these firms that go on to take another write-off. For instance, 61 percent of first time write-off firms take a second write off, and 42 percent of first time write-off firms take two more write-offs, etc. Panel B also shows the breakdown of the types of write-offs, whether they are layoff based, asset based, or a combination of the two.

Panel A: Number of Write-offs by Year and Type

Year	Asset	Layoff	Both	All
1985	20	4	25	49
1986	34	7	45	86
1987	48	6	48	102
1988	34	18	40	92
1989	34	10	45	89
1990	27	7	58	92
1991	40	18	51	109
1992	28	8	63	99
1993	43	20	72	135
1994	35	14	99	148
1995	36	18	91	145
1996	39	17	100	156
1997	42	27	99	168
1998	41	31	98	170
1999	42	22	121	185
2000	61	31	120	212
All	604	258	1175	2037

Panel B: Frequency of Write-offs

Write-offs	# Firms	Percent	Layoffs	Assets	Both
1	767	100	17%	37%	46%
2	468	61	14%	39%	47%
3	319	42	13%	34%	53%
4	216	28	9%	41%	50%
5	150	20	14%	33%	53%
6	116	15	11%	27%	62%
7	79	10	17%	15%	68%
8	61	8	10%	18%	72%
9	45	6	8%	28%	64%
10	31	4	7%	35%	58%
11	20	3	10%	35%	55%
12	16	2	23%	40%	38%
13	9	1	13%	20%	67%
14	7	1	14%	43%	43%
15	3	0.5	0%	67%	33%
16	3	0.4	0%	33%	67%
17	2	0.26	0%	0%	100%

Table II   Write-off Characteristics of Sample

This table summarizes the different types of write-offs that firms report. There are several different ways that a firm can write employees and assets off the books. I discuss these methods in Appendix A. The average charge is the average write-off the firm reported for each of the different types of write-downs. Write-off/Book Value is the total charge divided by book value of shareholders equity one month prior to the announcement. Write-off/Total Assets is the total charge divided by total assets one quarter prior to the write-off announcement.

			Write-off/Book Value		Write-off/Total Assets	
Type	Percent	Average Charge	Mean	Median	Mean	Median
Asset impairment charge	7.61	$67,100,000	0.02	0.01	0.09	0.02
Discontinued operations	14.28	$18,900,000	0.13	0.01	0.41	0.02
Layoff charge	8.86	$69,700,000	0.03	0.01	0.08	0.01
Restructure(asset and layoff based)	56.35	$72,100,000	0.06	0.01	0.23	0.03
Severance	4.09	$38,200,000	0.02	0.01	0.04	0.02
Partial write down	3.6	$78,800,000	0.05	0.01	0.17	0.03
Write-off of assets	5.22	$23,400,000	0.04	0.01	0.09	0.03
Total	2472	$59,400,000	0.04	0.01	0.13	0.02

Table III   Summary of Estimation Variables

This table shows the summary mean and medians of the independent variables used in the probit estimations. Panel A is across the whole sample. MV is the size of the firm, defined as the log of the market value. SHROWNPC is the CEO's percentage ownership in the company, shown as a percent. SALARY is the dollar annual CEO salary in 100ks, BONUS is the dollar annual CEO bonus in 100ks, and OPTIONS are the aggregate dollar value of all options granted to the executive during the year as valued by the company in 100ks. DIRSTK is the number of shares, which each non-employee director received during the year in thousands. SIZEBD is the number of directors, both inside and external. PER_OUT is the percentage of directors who have no relationship with the company. . GOV_INDEX is the Governance index, the lower the number the better the shareholder protection, and the higher the number, the higher the level of managerial entrenchment. GOV_INDEX is an index number formed from charter provisions listed in the IRRC publications. It does not replace board composition. DOLLAR_SENSITIVITY = is the dollar sensitivity of compensation to performance. RETURN_SENSITIVITY = is the return sensitivity of compensation to performance. The significance test uses a two-sided test to determine whether there is a statistical difference between the non write-off benchmark firms, and the write-off firms. Panel B shows the summary of governance variables on a per year basis for all firms in the sample. It also shows the percent of firms that decreased, remained unchanged , and increased their governance variables. A * denotes significance at the 5 percent level, and ** denotes significance at the 10 percent level.

Panel A

	Non-Write-off		One-Time Write-off			Multiple Write-off		
	Mean	Median	Mean	Median	t-value	Mean	Median	t-value
MV	5.25	5.64	9.64	10.53	13.92*	12.490	13.45	5.62*
SHROWNPC	2.00	0.00	4.00	0.00	1.94**	3.00	0.00	0.22
SALARY	666.21	650.00	629.55	599.07	1.130	657.95	667.51	0.32
BONUS	848.11	413.27	534.5	351.00	2.24*	548.31	439.46	3.67*
OPTIONS	1,346.08	353.44	2,385.19	451.26	1.99**	2,039.56	663.81	0.89
DIRSTK	0.06	0.00	0.05	0.00	0.350	0.13	0.00	1.07
SIZEBD	12.05	12.00	10.17	10.00	-11.97*	11.05	11.00	-3.67*
PERC_OUT	68.00	70.00	73.00	75.00	-2.87*	76.00	78.00	-7.11*
GOV_INDEX	9.06	10.00	8.10	9.00	1.99**	9.06	10.00	2.62*
RETURN SENSITIVITY	3,286.00	61	20,948.00	57.00	-2.98*	8,842.00	68.00	-1.91**
DOLLAR SENSITIVITY	231.00	43.00	1,972.00	34.00	-2.33*	864.00	55.00	-1.98**
ROA	7.3	7.33	4.25	4.38	3.85*	4.7	5.83	3.71*

Panel B

	GOV_INDEX			Board Size				Percent Outsiders			
Year	Mean	-1	0	1	Mean	-1	0	1	Mean	-1	0	1
1990	9.66	2%	93%	5%	11	9%	68%	23%	0.73	7%	66%	26%
1991	9.6	3%	94%	3%	11.86	11%	74%	15%	0.76	10%	65%	26%
1992	9.62	2%	94%	4%	12.51	7%	86%	7%	0.74	5%	64%	30%
1993	9.52	7%	78%	15%	11.52	10%	81%	9%	0.76	7%	64%	29%
1994	9.6	2%	97%	1%	11.76	8%	75%	16%	0.76	6%	64%	30%
1995	9.46	7%	76%	18%	12.24	10%	75%	14%	0.77	9%	57%	34%
1996	9.24	2%	96%	2%	11.58	12%	71%	17%	0.75	10%	57%	34%
1997	9.63	2%	95%	2%	11.83	14%	64%	22%	0.75	16%	62%	22%
1998	9.13	5%	83%	12%	11.83	18%	68%	14%	0.75	11%	64%	26%
1999	8.95	2%	96%	2%	10.61	13%	74%	12%	0.76	10%	69%	21%

Table IV CEO turnover and the Write-off Decision

Panel A shows the characteristics of executive turnover associated with a write-off announcement. The turnover data is from EXECUCOMP. If the write-off occurs up to one year after the CEO turnover, I include the turnover in the sample. There are two types of turnovers shown; those that occur with the replacement coming from inside the firm; and those with replacements coming from outside the firm. The table shows the percentage of non write-off, one-time write-off, and multiple write-off firms that have experienced CEO turnover. The t-value tests the hypothesis that write-offs have statistically significant different number of CEO turnovers to the industry benchmark. Panel B shows the probit estimation of CEO turnover with external replacement controlling for ROA, market value, and ROE. The results of this estimate are used to calculate the Inverse Mill's Ratio.

Panel A

Reasons	Non-Write-off			One-Time Write-off			Multiple Write-off		
	Inside	Outside	Total	Inside	Outside	Total	Inside	Outside	Total
Retires	0%	0%	0%	2%	7%	9%	2%	8%	10%
Resigns	0%	0%	0%	0%	2%	2%	2%	0%	2%
Dies	0%	0%	0%	0%	2%	2%	0%	0%	0%
Not Listed	23%	77%	100%	17%	70%	87%	31%	57%	88%
Total Number of Firms	8	27	35	11	48	59	46	85	130
t-value						-1.99**			-2.07*

Panel B

	Coeff.	T-value
Constant	-1.07	-5.65 *
MV	-.15	-2.01*
R	-0.03	-3.66 *
ROA	-0.02	-2.96*

Table V Probit Model Results

Panel A shows the results of the probit estimations for various models. Model 1 tests for a relation between CEO turnover and the write-off decision as shown in Equation (5). Model 2 (A) tests the probit estimate shown in Equation (6). Model 2 (B) tests the probit estimation discussed in Equation (7). Model 3 shows the results for the estimation of Equation (8), which tests for the relationship between the board's independence and the probability of a write-off occurring. Model 4 (A) tests the probit estimate of the impact of industry shocks on the write-off decision, while controlling for the quality of the company, as described in Equations (9) and (10). MV is the size of the firm; SHROWNPC is the percentage ownership in the company. CEO_OUT is a dummy variable, zero for firms without turnover, and one for firms with turnover and replacement from outside the firm. ROA is the return on assets, and TLCF is a dummy variable that is one if a firm has tax loss carry forwards. SALARY is the annual CEO salary, BONUS is the annual CEO bonus, and OPTIONS are the aggregate value of all options granted to the executive during the year as valued by the company. INTERLOCK is one if the management is entrenched and zero if it is not, as defined by Execucomp. Entrenchment generally involves one of the following situations: the officer serves on the board committee that makes his compensation decisions, or serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the compensation committee of the indicated officer's company. Hallock (1997) describes the use of this variable as a proxy for managerial entrenchment. RETYRS is the number of years the CEO has been in office. PPS is either the return sensitivity or the dollar sensitivity. The results shown are for the dollar sensitivity, although I perform the analysis for both measures. SIZEBD is the number of directors, both inside and external. PER_OUT is the percentage of directors who have no relationship with the company. DIROPT is the number of options, which each non-employee director received during the year in thousands. DIRSTK is the number of shares, which each non-employee director received during the year in thousands. GOV_INDEX = Governance index, the lower the number the better the shareholder protection. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

Independent	Model 1	Model 2(A)	Model 2 (B)	Model 3	Model 4 (A)	Model 4 (B)
Constant	-2.54	-3.49 *	-3.46 *	-5.65 *	-7.12 *	-7.20 *
MV	0.41 *	7.37 *	0.59 *	0.58 *	0.81 *	0.78 *
CEO_OUT	0.04 *				1.13 *	-1.36 *
DEBT_RAT	-1.77 *	-2.71 *	-2.36 *	-0.44 *	-5.98 *	-5.01 *
SHROWNPC	-0.63 **	4.23*			3.21	1.62
ROA	-0.14 *	-0.07*	-0.08 *	-0.06 *	-0.96 *	-0.09 *
TLCF	0.99 *	0.08*	1.38 *	1.07 *	3.57 *	3.49 *
SALARY		-0.01 *				
BONUS		0.00				
OPTIONS		-0.02				
PPS			0.01 *		0.91	0.01
RETYRS			-0.02 *		-0.29	-0.03
INTRLOCK			-1.53 *		-4.83 *	-4.74 *
SIZEBD				-0.08 *	-0.27 *	-0.24 *
PERC_OUT				1.84 *	4.42 *	4.49 *
DIROTP				0.10 *	0.33 *	-0.02 *
DIRSTK				-0.08	-0.01	-0.01
GOV_INDEX				-0.03 *	-0.21 *	-0.16 *
SHOCK					0.17 *	
RECESSION						0.58 *
EXPANSION						-0.12
χ^2(d.f.)	451.90	417.00	370.00	629.00	438.00	385.00

Table VI Marginal Effects of Probit Estimates

This table shows the marginal effects of the probit estimations for various models. Model 1 tests for a relation between CEO turnover and the write-off decision as shown in Equation (5). Model 2 (A) tests the probit estimate shown in Equation (6). Model 2 (B) tests the probit estimation discussed in Equation (7). Model 3 shows the results for the estimation of Equation (8), which tests for the relationship between the board's independence and the probability of a write-off occurring. Model 4 (A) tests the probit estimate of the impact of industry shocks on the write-off decision, while controlling for the quality of the company, as described in Equations (9) and (10). MV is the size of the firm; SHROWNPC is the percentage ownership in the company. CEO_OUT is a dummy variable, zero for firms without turnover, and one for firms with turnover and replacement from outside the firm. ROA is the return on assets, and TLCF is a dummy variable that is one if a firm has tax loss carry forwards. SALARY is the annual CEO salary, BONUS is the annual CEO bonus, and OPTIONS are the aggregate value of all options granted to the executive during the year as valued by the company. INTERLOCK is one if the management is entrenched and zero if it is not, as defined by Execucomp. Entrenchment generally involves one of the following situations: the officer serves on the board committee that makes his compensation decisions, or serves on the board (and possibly compensation committee) of another company that has an executive officer serving on the compensation committee of the indicated officer's company. Hallock (1997) describes the use of this variable as a proxy for managerial entrenchment. RETYRS is the number of years the CEO has been in office. PPS is either the return sensitivity or the dollar sensitivity. The results shown are for the dollar sensitivity, although I perform the analysis for both measures. SIZEBD is the number of directors, both inside and external. PER_OUT is the percentage of directors who have no relationship with the company. DIROPT is the number of options, which each non-employee director received during the year in thousands. DIRSTK is the number of shares, which each non-employee director received during the year in thousands. GOV_INDEX = Governance index, the lower the number the better the shareholder protection. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

Independent	Model 1	Model 2(A)	Model 2 (B)	Model 3	Model 4 (A)	Model 4 (B)
MV	0.05 *	0.06 *	0.01 *	0.05 *	0.07 *	0.07 *
DEBT_RAT	-0.20 *	-0.03 *	-0.04 *	-0.01 *	-0.02 *	-0.03 *
CEO_OUT	4.49 *				0.02 *	0.03 **
SHROWNPC	0.07 *	0.57 *			0.47	0.35
ROA	-0.02 *	-0.07 *	-0.08 *	-0.06 *	-0.08 *	-0.09 *
TLCF	0.11 *	0.08 *	0.89 *	1.07 *	1.15 *	1.52 *
SALARY		0.01 *				
BONUS		-0.03				
OPTIONS		-0.02				
PPS			0.09 *		0.01	0.00
RETYRS			0.00 *		0.00	0.00
INTERLOCK			-0.13		-0.19	0.61 *
SIZEBD				-0.01 *	-0.01 *	-0.01 *
PERC_OUT				0.22 *	0.29 *	0.30 *
DIROTP				0.01 **	0.00 **	0.00 **
DIRSTK				-0.01	0.00	0.00
GOV_INDEX				-0.01 *	-0.01 *	-0.01 *
SHOCK					-0.01 *	
RECESSION						0.01 **
EXPANSION						-0.02

Table VII Corporate Governance Measures and Write-offs

Panel A shows the univariate results for the governance quality of the weakest and strongest governance write-off firms. The significance tests whether good governance variables are different from bad governance variables. Panel B shows the estimation of Equation (9) for the 50 percent worst governance firms. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

Panel A: Strong Monitors vs. Weak Monitors

	Weak Monitors		Strong Monitors		t-value
	Mean	Median	Mean	Median	t-value
BDSIZE	18.00	18.00	6.05	6.00	36.01*
PERC_OUT	0.46	0.48	0.80	0.75	2.98*
GOV_INDEX	10.12	11.00	5.94	6.00	2.31*

Panel B: Multivariate Analysis of Governance

Independent	Model 4 (A)	t-values
MV	1.35	2.88*
CEO_OUT	0.02	0.06
SHROWNPC	0.47	0.35
ROA	-0.05	-0.65
TLCF	2.63	1.91**
PPS	0.00	-0.37
RETYRS	-0.04	-0.98
INTERLOCK	-0.19	0.61
SIZEBD	2.35	2.01*
PERC_OUT	-0.03	-0.99
DIRSTK	0.38	1.38
GOV_INDEX	0.47	2.69*
SHOCK	0.00	0.09

Table VIII   Corporate Governance Measures and Write-offs

Panel A shows the univariate results for the size of the write-off charges based on governance quality. The significance tests whether good governance charges are different from bad governance charges. Write-off charges are adjusted by the total assets. Panel B shows the estimation of Equation (12),

$$WO/TA = \beta_1 + \beta_{2-7}GOVVARS_i + \epsilon_i. \tag{12}$$

This robust regression tests whether governance affects the size of the write-off. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

Panel A: Univariate Estimate				
	Mean	Median	t-value	Median test
Well-monitored	0.02	0.01		
Poorly-monitored	0.06	0.03		
			1.53	0.09**
Panel B: Robust Regression				
		Coefficient	t-value	
MV		0.01	2.21*	
ROA		-0.03	-0.9	
TLCF		0.04	1.92**	
SIZEBD		0.02	2.76**	
PER_OUT		-0.18	-1.98*	
CEO_OUT		-0.03	-0.40	
GOV_INDEX		0.02	0.25	
PPS		0.01	0.18	
CONSTANT		0.12	0.91	
R^2		0.09		

Table IX   Abnormal Return Breakdown, by Year and Firm Type

This table reports the breakup of the type of firm year by year, based on write-offs in the period of 1985-2000. I compute abnormal returns as $AR_i = \sum_{T-1}^{T+1} R_{i,t} - R_{s,i,t}$, where $R_{i,t}$ is the return on date t for firm i, and $R_{s,i,t}$ is the return on date t, of the equally weighted index of the size portfolio s to which firm i belongs. AR is reported in percentage format. t is the announcement date. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

	One-time Write-off				Multiple Write-off				All Firms			
Year	-1.00	0.00	1.00	Sum	-1	0	1	Sum	-1	0	1	Sum
1985	-0.29	-0.65	-0.36	-1.30	-0.95	-2.26	-1.74	-4.95	-0.62	-1.46	-1.05	-3.13
				-.62				-2.28*				-1.81
1986	-0.09	1.20	-0.81	0.30	-0.48	0.05	1.07	0.64	-0.26	0.29	0.05	0.08
				-1.34				-0.56				-1.12
1987	-0.12	0.09	-0.70	-0.73	-0.47	-0.03	0.82	0.32	-0.59	0.15	0.28	-0.16
				-1.95**				-0.89				-0.56
1988	-0.19	-0.98	2.20	1.03	-0.09	-1.10	0.85	-0.34	-0.33	-0.72	0.57	-0.48
				-1.69				-.65				-1.49
1989	-0.25	0.69	0.72	1.16	0.21	-0.28	-0.54	-0.61	-0.02	0.21	0.09	0.28
				-0.51				-1.47				-0.41
1990	-1.04	-0.70	-1.93	-3.67	0.25	0.71	0.47	1.43	0.19	-0.55	0.08	-0.28
				-1.69				1.95**				-0.14
1991	0.74	-0.10	0.11	0.75	-0.41	-0.23	0.07	-0.57	-0.11	-0.07	-0.24	-0.42
				-0.79				-1.10				-1.53
1992	1.46	-1.65	1.04	0.85	0.71	-0.26	0.52	0.97	-0.74	-0.50	0.45	-0.79
				-1.29				-2.03				-0.48
1993	-0.09	-0.25	-0.29	-0.63	0.70	0.51	0.16	1.37	-0.59	0.24	0.11	-0.24
				-1.06				-0.08				-1.53
1994	-0.05	-0.63	-0.55	-1.23	0.20	0.37	0.16	0.73	0.07	-0.13	-0.18	-0.24
			0.00	-2.16*				-1.05				-0.54
1995	-0.09	-2.55	0.66	-1.98	0.14	0.04	-0.30	-0.12	0.25	-0.14	-0.29	-0.18
				-1.29				-.23				-0.79
1996	0.18	1.77	0.84	1.11	-	0.43	0.24	0.19	0.10	0.45	0.33	0.88
				-.69				-.41				-1.72
1997	0.20	-1.04	0.14	-0.70	-0.19	-0.41	-0.44	-1.04	-0.13	-0.42	-0.15	-0.70
				-1.27				-1.11				-0.56
1998	0.48	0.45	0.43	1.36	-0.22	0.35	0.45	0.58	-0.43	-0.20	-0.19	-0.82
				-1.95**				-0.99				-0.79
1999	1.52	-1.74	-1.09	-1.31	-0.13	-0.78	-0.02	-0.93	0.40	0.02	-0.50	-0.08
				-1.82				-.84				-0.73
2000	0.15	0.58	-2.38	-1.65	0.15	-0.03	0.38	0.50	0.13	0.54	-0.50	0.17
				-1.95**				-0.49				-0.34
ALL	-0.36	-1.06	-0.40	-1.82	-0.01	-0.19	-0.17	-0.37	-0.19	-0.63	-0.29	-1.10
				-2.02*				-0.49				-1.08

Table X   Market Reaction to Write-offs

This table shows the combined impact of CEO turnover, pay-performance sensitivity, and board composition on the announcement effects for Equation (13), which uses only the write-off firms:

$$AR_i = \beta_1 + \beta_2 SIZE_i + \beta_3 SIZEBD_i + \beta_4 PERC\_OUT_i + \beta_5 CEO\_OUT_i$$
$$+\beta_6 RECESSION_i + \beta_7 PPS_i + \beta_8 ROA_i + \beta_9 WO\_TA_i$$
$$+\beta_{10} WO\_\#_i + \beta_{11} TYPE_i + \beta_{12} DEBT_i + \beta_{13} GOV\_INDEX_i + \epsilon_i. \tag{13}$$

I compute abnormal returns as $AR_i = \sum_{T-1}^{T+1} R_{i,t} - R_{s,i,t}$, where $R_{i,t}$ is the return on date t for firm i, and $R_{s,i,t}$ is the return on date t, of the equally weighted index of the size portfolio s to which firm i belongs. A * denotes significance at the 10 percent level, and ** denotes significance at the 10 percent level.

Independent Variable	Coefficient	t-Value
MV	0.002	2.51*
ROA	0.001	-0.16
DEBT_RATIO	-0.030	-1.65
GOV_INDEX	-0.024	-2.63*
SIZEBD	-0.016	-1.97**
PERC_OUT	0.020	2.56 *
TYPE	-0.001	-0.16
WO_NUM	0.001	1.39
RECESSION	0.010	1.99**
WO_TA	-0.011	-3.41 *
PPS	0.026	11.49*
CEO_OUT	0.002	2.42*
CONSTANT	-0.026	-2.15*

Table XI Announcement Day Returns Sorted by Governance Measures

This table breaks up the announcement day effects into portfolios based on the governance quality, and CEO turnover. There are ten portfolios of governance qualities, with 1 housing the best governance companies, and 10 housing the worst. The governance data is from IRRC, and the turnover data from Execucomp. In parentheses is the t-values that test whether the returns are significantly different from 0. I compute abnormal returns as $AR_i = \sum_{T-1}^{T+1} R_{i,t} - R_{s,i,t}$, where $R_{i,t}$ is the return on date t for firm I, and $R_{s,i,t}$ is the return on date t, of the equally weighted index of the size portfolio s to which firm I belongs. A * denotes significance at the 5% level, and ** denotes significance at the 10 percent level.

| GOV Port | One-Time Write-off | | | | Multiple Write-off | | | |
| | No CEO Turnover | | CEO Turnover | | No CEO Turnover | | CEO Turnover | |
	AR	t-value	AR	t-value	AR	t-value	AR	t-value
1	1.98	2.65*	6.10	2.70*	1.40	2.41*	1.70	1.55
2	1.90	4.90*	1.50	2.91*	1.10	2.11*	2.20	1.99**
3	0.20	0.02	1.60	1.03	0.70	0.46	1.00	1.30
4	1.50	-0.02	1.90	1.80	-0.80	-1.11	0.40	0.30
5	-1.70	-0.83	-2.10	-1.79	1.10	2.66*	-0.80	-1.18
6	1.70	1.18	2.00	0.61	0.00	0.01	0.70	0.78
7	-3.10	-2.21*	7.00	0.94	-0.30	-0.41	0.90	0.72
8	-0.50	-0.43	-0.60	1.03	0.30	0.46	0.70	0.62
9	0.30	0.26	1.50	0.01	0.80	0.95	0.40	0.33
10	0.00	0.09	-1.40	-1.22	-1.60	-1.95**	0.40	0.15

Chapter 2

Write-offs and Liquidity

2.1   Introduction

Write-offs are fast becoming a prominent event in U.S. financial markets. The number of write-offs for consumer manufacturing firms increased from 1980 to 2000 by 140 percent. With this increased usage of write-offs, it has become increasingly important to understand what, if any, impact write-offs have.

In this paper, I analyze the effect of write-off announcements on stock market liquidity. If there is a high level of asymmetric information, spreads will increase to reflect this knowledge gap. Likewise, if there is a decrease in asymmetric information, spreads will decrease to reflect this improved information environment.

Information asymmetry between investors and management can hurt a firm's market value (Myers and Majluf, 1984). Informed traders thrive in a less transparent environment and profit more from their private information, which creates an adverse selection problem for investors. O'Hara (2003) argues that reducing the amount of hidden private information can favorably affect asset prices due to improved price-discovery process and liquidity. Prior research provides a framework for this study of investigating the relationship between write-off announcements and secondary market liquidity.

Write-offs may convey specific information about operating performance and strategies. When firms announce write-offs, two types of information might be disclosed to the public. The write-off announcement could uncover a problem not known to exist before the announcement. The announcement can also show how the firm is taking actions to repair the problem area. This voluntary disclosure of information has the potential to reduce information asymmetry by making private information acquisition more readily available to potential traders. The spread could therefore be affected by a decrease in perceived adverse selection risk that is not reflected by an observable decrease in volumes.

I use several tests to determine what impact write-offs have on secondary market liquidity. Using univariate analysis, I compare the absolute and relative spreads before a write-off announcement days to the write-off window and find a significant improvement in liquidity following a write-off announcement. I run the same analysis for trading volume and total number of transactions and find that both increase following the write-off announcement. In addition, I test whether the liquidity impact of write-offs is different from any other announcement. I find that write-off announcements show a greater liquidity improvement than earnings announcements. I also use multivariate analysis to test whether the liquidity effect (as shown by absolute spread, relative spread, and total number of transactions) is robust to the inclusion of price, volume, and volatility control variables. Both absolute and relative spreads decrease following a write-off announcement. The number of transactions improves following a write-off announcement. Taken as a whole, the findings demonstrate that write-off announcements generate a benefit to investors in the form of improved liquidity.

Next, looking only at write-off firms, I test whether the liquidity benefit of write-offs is greater for companies with good corporate governance versus companies with bad corporate governance. Minnick (2004) show that the market reacts differently to write-off announcements, based on the quality of the company's governance. If a company has effective monitoring mechanisms, then traders may trust the quality of the information to a greater extent than the information from a poor governance firm, leading to a greater reduction in the asymmetric information. I find that governance does affect the liquidity effects of write-offs. I find the number of transactions increases and spreads decrease more for high governance firms versus poor governance firms consistent with a larger reduction in asymmetric information for high governance firms.

Lastly, I decompose the bid-ask spread in order to measure changes in the adverse selection component resulting from write-offs. A reduction in information asymmetry, resulting from the write-off announcement should generate a decrease in the adverse selection component of the spread. In fact, it is the decrease in this component that is expected to produce both narrower spread and greater transactions volume. The positive relation between adverse selection and bid-ask spreads is well documented in the literature. See Brockman and Chung (1999) and Heflin and Shaw (2000) for evidence of the inverse relation between adverse selection and secondary market liquidity. I find that adverse selection costs decrease following a write-off, and that this decrease is greater for companies with stronger monitoring mechanisms.

These findings paint an economically intuitive picture of managerial and investor behavior in the secondary market. Write-offs convey private information that managers possess, but that outside market

participants do not observe. Market participants understand that write-offs convey some information. When the write-offs occur, they enter the market, thereby decreasing the bid-ask spreads and increasing number of transactions. This is especially important for companies with good monitoring mechanisms. This liquidity provision dynamic is important because higher liquidity can lead to lower costs of capital and higher firm values (see Amihud and Mendelson (1986), Barclay and Smith (1988), and Jacoby, Fowler, and Gottesman (2000)). Secondary-market investors adjust spreads, adverse selection costs, and number of transactions in a manner consistent with a reduction in information asymmetry.

The remainder of this paper is structured as follows. In section II, the methodology and data selection methods are discussed. In Section III, the liquidity effects of write-offs are tested by comparing average bid-ask spreads, trading volumes, and non-trading days before and after write-offs while controlling for the behavior of non -write-off firms. Section IV looks at corporate governance and write-offs, while Section V looks at the adverse selection costs, and Section VI concludes the paper.

2.2 Sample and Methodology

To generate my sample, I collect write-off information, focusing on NYSE listed companies from 1980 to 2000 in the 2000-2999 SIC code. Using the original company list, I search Lexis Nexis and Dow Jones News Retrieval services for specific key words. For each company, I search for articles that match key words for my sample. The key words I used are write down, write-off, restructure, charge against earnings, layoffs, and severance. When the query results in a match, I take the first article in the series of articles that refers to a current write-off that the company is announcing. I use the date of the article as the announcement date of the write-off. I obtain the following information from the article: the amount of the write-off; whether the write-off was generated by assets, layoffs, or both; the purpose of the write-off (restructure, write-down, plant closing, etc.); the justification cited by the company; and whether the write-off amount is stated on a before-tax or after-tax basis. The sample contains asset-based and layoff-based write-offs (see Minnick (2004) for a more in depth description of the data collection process).

To ensure that write-offs in my sample are not extensions of earlier events, I set an arbitrary standard under which I assume that any write-off announcements occurring within six months of earlier write-off announcements are related. This exercise is also performed for break off points of one month, three months, four months, eight months, and twelve months. Although doing so affects the sample size, it does not affect the analysis or findings. Therefore, I only describe results using the 6-month break point.

I determine which write-off is a first-time event or a subsequent event. To define multiple write-offs, I need to establish an arbitrary time interval. The standard most researchers use defines multiple write-offs as any write-off event that occurs within 16 quarters of a prior write-off event. To identify a company's first write-off, I look at all write-offs that occur during the first five years of the sample: 1980-1985. I require an initial period of 16 fiscal quarters with no write-offs before I add a firm to the sample. I denote the write-off following this break as a first time write-off. Because the original sample begins in 1980, the first reported write-off in the sample occurs in the first quarter of 1985. To test the sensitivity of this break point, I also use five other quarter break points to define first time write-offs, (8, 12, 18, and 20 quarters) to separate consecutive write-offs. My conclusions become more robust with the longer measures and weaken slightly with the short-term definitions, and since the inference changes only marginally, I use 16 quarters. After I identify the first time write-off for a company, write-offs that follow are labeled as second, third, fourth write-offs, etc. These subsequent write-offs must occur within 16 quarters after the prior write-off. If the write-off occurs after 16 quarters, I label it as another first time write-off.[1] The data collection and cleansing process leaves me with 230 companies that announced 1,075 write-offs from 1985-2000.

To examine write-off company characteristics, it is important to have a benchmark to compare the write-off firms. Out of the 390 NYSE listed firms in the 2000-2999 SIC codes for 1985-2000, there are 160 firms that have never had a write-off. I match the announcement date of each write-off to the 160 non write-off firms. This results in 172,000 non write-off matched firms. I then average across these firms to create a benchmark measure for every write-off event.

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[1]See Minnick (2004) for more details on the data collection.

The distribution of write-offs over the 15-year sample period appears in Table 1. The number of write-offs more than doubles from 1985 to 2000 (25 versus 90 write-offs). Write-offs that combine both assets and lay-offs, such as restructuring, have the largest charges ($100.2 million on average), followed by layoffs ($68.7 million on average), and assets ($63.5 million on average). There is no clear trend in the charge amounts over time. When adjusting write-offs by total assets, no ratio is greater than five percent.

Table 2 provides summary statistics for all of the NYSE listed consumer manufacturing companies from 1993 - 2000 in the consumer manufacturing sector a month prior to the write-off. Approximately 25 percent of all the NYSE consumer-manufacturing firms took a write-off over my sample. Although write-offs are representative of the population, they tend to have lower price levels, trading volumes, and daily returns than the non-write-off firms. Market capitalization is larger for write-off firms, as compared to non-write-off firms. Twenty-one percent of the write-off companies in my sample have taken two write-offs, and 14 percent have taken three or more write-offs.

2.2.1 Liquidity Data

Raw trading data is collected from the New York Stock Exchange Trade and Quote database (TAQ). This database reports every round lot trade and every quote from 1993 onwards on the New York Stock exchange.[2] I match the TAQ data to my write-off dataset using perm numbers. This leaves 594 remaining write-offs. The loss in data comes from excluding NASDAQ and AMEX firms from the sample and limiting the write-offs to 1993 to 2000.

I begin my analysis by looking at the liquidity trends surrounding write-off announcements, both in the short and long terms. Using two separate measures for liquidity, I look at the trend from 500 trading days before the write-off to 500 trading days after the write-off. The variables for liquidity include relative bid-ask spread, absolute bid-ask spread, turnover, and number of transactions. Relative spread is defined as follows,

$$RSP_{i,t} = \frac{AP_{i,t} - BP_{i,t}}{0.5 * (AP_{i,t} + BP_{i,t})}, \tag{2.1}$$

where $AP_{i,t}$ is the closing ask price on day t for firm i, $BP_{i,t}$ is the closing bid price on day t for firm i, and $RSP_{i,t}$ is the relative spread on day t for firm i. Absolute spread is defined as follows,

$$ASP_{i,t} = AP_{i,t} - BP_{i,t}, \tag{2.2}$$

where $ASP_{i,t}$ is the absolute spread on day t firm i. I filter out quotations for which the ask is smaller than or equal to the bid price (crossed markets), as well as all spreads greater than $5.00 and spreads that represent more than 20% of the quote midpoint (outliers). These filters affect less than one percent of the observations.

Turnover is defined as the total monthly volume divided by number of shares outstanding. The daily average trading volume is from TAQ, and the shares outstanding are from Compustat. The number of transactions is defined as the number of round lots(100 shares)available to trade at the bid price plus the number of shares available to trade at the ask price as follows:

$$Transaction = BidTransactions + AskTransactions \tag{2.3}$$

Market makers reduce the number of transactions when they are wary of the informational environment. Lower transaction numbers give market makers an opportunity to adjust prices quickly. Bacidore, Battalio, and Jennings (2002) suggest that each measure of liquidity is deficient in properly assessing the level of liquidity. Having a composite measure is especially helpful in empirical analysis, especially if spreads and transactions point in different directions. To alleviate this issue, I calculate a composite measure of liquidity, called transaction/spread ratio as described below. This measure is similar to both

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[2]See Hvidkjaer (2004) for an explanation of the database, and the technique used to aggregate the data to daily data.

Bacidore et. al. (2002) and Jain, Kim and Rezaee (2004). It depicts market liquidity as a function of both higher number of transactions and lower quoted spreads:

$$T/S = Transaction Number / Absolute Spread \qquad (2.4)$$

I analyze changes in liquidity using two tests. The first is a t-test comparing the cross sectional mean from the pre-announcement period to the cross sectional mean after the write-off announcement. The second, more powerful test calculates for each stock, the difference between the mean before the announcement date and the mean after the announcement date. I then compare the frequencies of the increases and decreases between the write-off and non-write-off firms using a chi-square test under the null hypothesis that the relative frequencies are the same (Gibbons (1976)).

2.3   Liquidity Effects

Table 3 shows the summary statistics for the different liquidity measures for the write-off firms six months before and after the write-off announcement, compared to 25 days following the write-off announcement. I define the write-off period as 25 days following the write-off announcement, so the write-off window is t=0 to t=25. The non write-off window is defined as any time 120 days before the write-off announcement, or 120 days after the write-off announcement. The period after one write-off is not mutually exclusive with respect to the period before another write-off. Because there is no clear interpretation of before and after periods, I rely only on the surrounding non write-off period as my benchmark.

I calculate the means and medians for various measures across write-off periods and surrounding non-write-off periods for each sample firm. Table 3 provides summary statistics for the write-off and surrounding non-write-off periods, along with paired *t*-test and sign test results. *Volume* is the total trading volume per day. *Price* is the average daily price transaction, and *Returns* is the average daily return. *Volatility* measures the variance of returns. *Absolute Spread, Relative Spread, Total number of transactions, Ask number of transactions* and *Bid number of transactions* are daily averages for the absolute dollar spread, relative spread, total number of transactions, ask-side number of transactions, and bid-side number of transactions, respectively.

The univariate test results show that average daily trading volumes are 9 percent higher during the write-off period, as compared to the surrounding non write-off period. The average stock price is 12 percent lower during the write-off period as compared to the surrounding non-write-off period. The average absolute (relative) spread of the write-off firms is $0.28 (1%) while the average absolute (relative) spread of the surrounding non write-off period is $0.37(2%). The average number of transactions of write-off firms is slightly higher than the surrounding non-write-off period. The liquidity measures yield strong evidence. Spreads tend to decrease, thereby increasing liquidity, while turnover and number of transactions tend to increase, which also increase liquidity. Overall, the write-offs appear to have improved liquidity as compared to the surrounding non write-off periods.

I next test whether this liquidity improvement is unique to write-offs or if it occurs for any quarterly announcement. To test for this unique reaction, I compare the liquidity changes the write-off announcement to the liquidity changes of earnings announcements in the write-off quarter. Using a univariate analysis, I compare the mean difference in the liquidity changes. The results are shown in Table 4. I find that the liquidity improvement for write-offs is significantly different than it is for earnings announcements. These findings suggest that write-offs have a greater impact on liquidity than other types of announcements.

I have established that actual write-off periods are associated with significant changes in price, volume, and volatility. The univariate tests have also shown that liquidity improves in two ways, number of transactions, and spread. I next focus on measuring the impact of write-offs on liquidity after controlling for changes in price, volume, and volatility. These three independent variables are widely used in the market microstructure literature to control for the trading effects on firm liquidity. Tinic and West (1974), Benston and Hagerman (1974), and Weston (2000) have shown that spread is positively related to share price. We include the return volatility measure since the risk of the security is a component of dealer risk and dealer inventory carrying costs. Several theoretical studies include risk as a factor that positively affects the

spread, including Garman(1976), Stoll (1989), and Ho and Stoll (1981).

Table 5 presents the results from the following regression model:

$$Liquidity_i = \alpha + \beta_1 WO_i + \beta_2 Volume_i + \beta_3 Price_i + \beta_4 Volatility_i + \epsilon_i, \qquad (2.5)$$

where $Liquidity_i$, the dependent variable, represents three liquidity measures: absolute spread, relative spread, and total number of transactions. $Volume_i$, $Price_i$, and $Volatility_i$ are the independent control variables. WO_i is a dummy variable that is one if the day falls in the write-off window and zero otherwise. All variables represent daily averages, and all but the dummy variable are transformed by taking the log. I adjust the t-statistics for heteroscedasticity, serial correlation, and arbitrary cross-correlations by using the Newey and West (1987) procedure.

Table 5 provides the results from estimating equation (2.5) for each of the four liquidity measures, absolute spread, relative spread, total number of transactions, and the transaction/spread ratio. The co-efficients for all of the control variables are significant at 5 percent or less. The signs of the coefficients are consistent with microstructure theory. Higher volumes and prices are associated with higher liquidity, while higher volatility levels are associated with lower liquidity. The estimated volume coefficients are negatively related to absolute and relative spreads, while positively related to total number of transactions. Increased stock prices are related to wider absolute spreads, narrower relative spreads, and increased number of transactions. Higher volatility is positively related to spreads and negatively related to number of transaction.

The most important result of this estimate is the coefficients for WO, the dummy variable for the write-off period. The negative and highly significant write-off period coefficients for both the absolute and relative spread regression demonstrate that bid-ask spreads decrease following a write-off announcement, even after controlling for changes in price, volume, and volatility. The write-off coefficient is positive and significant for the transaction regression, which shows the write-off activity increases firm transactions.[3]

I interpret these results as evidence of the asymmetric-information hypothesis. When traders are affected by a decrease in the asymmetric information, they increase liquidity by reducing bid-ask spreads and increasing number of transactions. I show that spread decrease significantly in both univariate and multivariate testing.

2.4   Governance and Liquidity

Minnick (2004) shows that the market reacts differently to the information content of write-offs based on the quality of the announcing firm's governance. This relationship between governance and write-offs can also have implications on the liquidity effect of write-off announcements. If the information flowing from good governance companies' write-offs were more transparent than the information from bad governance write-offs, then one would expect to see a greater improvement in liquidity for good governance firms, as compared to bad governance write-off firms. To test whether this is true, I run the following model,

$$Liquidity_i = \alpha + \beta_{1-5} 1 GOV\_VARS_i + \beta_6 Volume_i + \beta_7 Price_i + \beta_8 Volatility_i + \epsilon_i, \qquad (2.6)$$

where $Liquidity_i$, the dependent variable, represents the change in three liquidity measures: absolute spread, relative spread, and total number of transactions. $Volume_i$, $Price_i$, and $Volatility_i$ are the independent control variables. All variables represent daily averages, and all are transformed by taking the log. GOV_VARS are the various governance variables used in Minnick (2004), including CEO turnover, board size, percent of outsiders on board, and shareholder protection index. NEWCEO is a dummy variable that is one if there was CEO turnover, and zero otherwise. BDSIZE is the number of members on the board,

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[3]I also run the analysis with three sub samples: companies with strong monitoring mechanisms, companies with mediocre monitoring mechanisms, and companies with weak monitoring mechanisms, based on the IRRC database from Gompers, Ishii, and Metrick (2003). I find that the above results are driven by the strong and mediocre monitored companies. The poor weakly monitored companies do not show any significant liquidity improvement.

PERCTOUT is the percent of uniquely independent outside board members, as discussed in Yermack (1999). GOV_INDEX is the IRRC metric, where the higher the index, the worse the level of shareholder protection. Conversely, the lower the number, the stronger the shareholder protection. This measure is discussed in detail by Gompers, Ishii, and Metric (2002). I adjust the t-statistics for heteroscedasticity by using a robust regression. The analysis is run only on the write-off firm 25 day window.

Table 6 shows the results of the estimate of model (2.6). As before, the control variables in Table 6 are all highly significant and exhibit the expected signs. More important are the results of the governance variables. The results suggest that the better the governance, the higher the improvement in liquidity. The board composition variables, as well as the shareholder protection variable are all significant determinants for both the spread and number of transactions at the five percent significance level. BDSIZE and GOV_INDEX are positively related to spreads, and negatively related to number of transactions. PERCTOUT is negatively related to spread and positively related to number of transactions. CEO turnover is negatively related to spreads and positively related to number of transactions. I interpret these results as evidence that companies with good board composition, or strong shareholder protection measures show a greater reduction in asymmetric information from a write-off announcement than companies with poor governance.

The empirical evidence in Tables 5 and 6 supports the following conclusions. When companies divulge private information, such as a write-off, absolute and relative spreads decrease significantly, and total number of transactions increase substantially. The quality of the information released is better, and less noisy for good governance firms, as compared to poor governance firms.

To test the robustness of my results, I run the above analysis for both first time and multiple write-offs. Table 7 shows the results of these estimates. Panel A shows the results of model (2.6) for a company's first time write-off. Panel B shows the estimate for multiple write-offs. There is not much difference for segmenting the impact of liquidity by first versus multiple write-offs. I use a Hausman test to see if there is any significant difference in liquidity for first and multiple write-offs. I find that the liquidity benefit of write-offs exists regardless of how many write-offs a company has taken in the past.

In addition, I examine whether the size of the write-off affects the changes in liquidity. The results are shown in Table 8. I find that the larger the size of the write-off, the smaller the impact on liquidity. I find that larger write-offs lead to smaller changes in spreads, and absolute spreads. The number of transactions is also negatively impacted by write-off size.

2.5   Adverse Selection

A significant recent advance in the market microstructure literature is the development of models that decompose the bid-ask spread into various components. In these models, the spread generally has three components: order processing, inventory holding, and adverse selection (asymmetric information). Demsetz (1968) and Tinic (1972) identify an order processing cost that is made up of exchange and clearing fees, bookkeeping and back office costs, the market maker's time and effort, and other random business costs. Since a large part of this cost is fixed, order-processing costs are lower for more heavily traded securities. Inventory holding costs are due to order flow imbalances that cause the market maker's inventory positions to deviate from optimal levels (Stoll (1978) and Ho and Stoll (1983)). Wider bid-ask spreads, and larger inventory holding costs result from increased deviation. Copeland and Galai (1983), Glosten and Milgrom (1985) and Easley and O'Hara (1987) suggest that asymmetric information and its consequent informed trading is a third spread component. Adverse selection costs are included in the spread to cover market participants' expected losses to informed traders.

In prior sections, I show that the write-off announcement is associated with narrower spreads, and increased number of transactions, particularly after controlling for changes in price, volume, and volatility, and governance measures. In this section, I focus on the adverse selection component of the spread in order to isolate the potential cause of these improvements in liquidity. According to the information-asymmetry hypothesis, increased information in the market will decrease adverse selection costs. The validity of my

empirical results, however is dependent on the accuracy of the component estimation technique.[4] To control for co-tangential specification errors, I estimate the adverse selection components using several decomposition models, which help to address issues of robustness and accuracy.

I intend to measure changes in adverse selection caused by a write-off announcement. In each of the decomposition models, I introduce the interaction term WO, which takes the value of one for trades associated with write-off announcements, and zero otherwise. I define WO to include the actual announcement day, and 25 subsequent trading days.[5] Alternative definitions of the period provide similar results as those reported here within. Positive and significant coefficients on the WO term would confirm the hypothesis that write-offs induce higher adverse selection costs. Measures such as bid-ask midpoints and transaction process are transformed by taking natural logarithms, as in Lin, Sanger, and Booth (1995). Each decomposition model is estimated on a pooled cross sectional basis.[6]

Lin Sanger and Booth (1995) develop a method of estimating empirical components of the effective spread that follows Huang and Stoll (1994), Lin (1993), and Stoll (1989). Lin et al. (1995) define the signed effective half spread, z_t, as the transaction price at time t, P_t, minus the spread midpoint, M_t. The signed effective half spread is negative for sell orders and positive for buy orders. To reflect possible adverse selection information revealed by the trade at time t, Lin et. al (1995) add λ, which is the adverse selection component of the bid-ask spread.

I follow the LSB (1995) decomposition technique. In the model, the parameters are estimated through the following regression equation:

$$\delta M_{t+1} = \lambda z_t + \epsilon_{t+1}, \qquad (2.7)$$

where,
M_t = log quote midpoint at time t
λ = parameter of regression which estimates the adverse selection component of the spread
δ = Change in relative variable from t to t+1
$z_t = P_t - M_t$
P_t = log trade price at time t, and
ϵ_{t+1} = random error term with zero mean and constant variance. I follow Lin et al. (1995) by using a robust OLS to estimate the following equation:

$$\Delta M_{t+1} = \lambda z_t + \lambda_{WO}(z_t * WO_t) + \epsilon_{t+1}, \qquad (2.8)$$

where λ_{WO} is the incremental adverse selection component during the write-off period.

Table 9 shows the estimated adverse selection component, λ of 0.15 (t-value = 23.55) is significant at five percent. The result can be interpreted as 15 percent of the bid-ask spread is attributable to information costs. The more important result is the estimated interaction term, λ_{WO} of -0.30 (t-value = -23.44), which is significant at five percent. The interaction term confirms that write-off announcements decrease adverse selection costs. During write-off periods, adverse selection decreases by 15 percent of the bid-ask spread.

I also decompose the spread using the empirical model of Huang and Stoll (1997), and implemented by Weston (2000). They derive a simple model that allows a one-step decomposition of the information component as a percentage of the spread. The remaining spread stems from order-processing costs and market maker rents.

The model identifies these components by measuring how the midpoint of the spread, M_t, changes as a function of the direction of trades. They define an indication variable Q_t, which takes on the values,

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[4]See Van Ness, Van Ness, and Warr (2001) for a discussion of the various benefits of different adverse selection models.

[5]See Brockman and Chung (2001) for a description of this interaction technique.

[6]I also run the estimations on a firm-by-firm basis, and find that it does not alter the results.

{-1,0,1} based on the direction of trade. If P_t¡M_t, then Q_t = -1 (sell order), if P_t= M_t, then Q_t=0, and if P_t. M_t, then Q_t=1 (buy order). The model is specified as

$$\Delta M_t = \alpha(S_{t-1}/2)Q_{t-1} + +\epsilon_t, \tag{2.9}$$

where α measures the proportion of the half spread $S_{t-1}/2$, that stems from information costs. I follow Huang and Stoll (1997) by using a robust OLS to estimate the following equation:

$$\Delta M_t = \alpha(S_{t-1}/2)Q_{t-1} + \alpha_{WO}(S_{t-1}/2)Q_{t-1} * WO_t) + \epsilon_{t+1}, \tag{2.10}$$

where α_{WO} is the incremental adverse selection component during the write-off period.

Table 8 shows that the estimated adverse selection component of the model, α has a coefficient of 1.43. (t-value = 5.01). This can be interpreted as 143 percent of the bid-ask spread is attributable to information costs. The interaction variable,α_{WO}, is -1.5, (t-value = -4.61). This can be interpreted as evidence that write-offs decrease adverse selection costs by 7 percent.

Overall, the decomposition results are consistent with the liquidity results. Write-offs reduce the information asymmetry in the market. This results in a situation where market participants react by reducing adverse selection costs, and increasing liquidity.

2.6 Robustness Checks

In addition to the microstructure literature concerning information asymmetry, another strand of literature considers analysts estimates as a good indicator of information asymmetry, where an increase in information about a firm tends to lead to a convergence of opinions regarding the firms expected future earnings. These papers typically use proxies for asymmetric information derived from consensus analysts forecasts of earnings per share. Krishnaswami and Subramaniam (1998), for example, use the analysts forecast errors to examine the change in the information environment before and after the completion of a spin-off. In this section, I use analyst forecasts as an additional measure of the level of information asymmetry.

I use IBES and First Call data to analyze the relationship between write-offs and earnings. Table 10, Panel A, shows the summary statistics of the First Call analyst data. The estimates are for the first quarter following the write-off announcement. Instead of using the average of all of the analyst forecasts for a particular firm in a particular quarter, I look at each one individually. Doing so allows me to see if there is less dispersion in forecasts after the write-off. The results are consistent with our earlier findings. Overall, write-offs lead to a significant reduction in information asymmetry which is reflected in the analyst estimates. These results are driven by the better goverened firms. The weakly monitored firms do not show a significant change in earnings transparency(via a change is surprise). However, both the mediocre and strongly monitored firms do show an improvement.

In Table 10, Panel B, I formally test the relationship between forecast error, and firm specific variables. Using the following regression, I estimate what impact write-offs, governance, and earnings management have on the analyst forecast error:

$$FORECASTERROR = \beta_1 + \beta_2 SIZE_i + \beta_3 WO_i + \beta_{4-9}GOVVARS_i + \beta_{10}ACCRUALS_i + \beta_{11}GROWTH\epsilon_{t+1}, \tag{2.11}$$

where FORECASTERROR is defined as the absolute value of the surprise, GROWTH is defined as the change in sales from the same quarter in the previous year. I also control for ACCRUALS, defined as GAAP earnings less cash from operations. I include growth because growing firms have predictably lower cash flows due to higher working capital and long-term capital investments, but less predictable earnings. I include ACCRUAULS as a proxy for earnings management, as a company that utilizes earnings management techniques has more easily predicted future earnings. The results support the above conclusions, where write-offs lead to a significant decline in forecast error. In addition, firms with smaller boards, and a higher percent of outside directors see a significant decline in the forecast error. Overall, the forecast error evidence suggests that write-offs, especially write-offs from well monitored companies lead to a reduction

in information asymmetry, and an improvement in earnings transparency.

2.7   Conclusion

This study is motivated by the rise in the use of write-offs over the past two decades. With the increase usage of write-offs, it has become unclear as to whether write-offs improve the information environment, or just create more noise. The problem is exacerbated by unclear disclosure policies for the write-off events. Management has the discretion to decide when to take a write-off and for how much the write-off amount should be. This paper attempts to shed some light on the impact of the announcements on the information environment, by analyzing write-off announcements from 1990 to 2000.

The goal of this paper is to measure the impact of write-offs on liquidity. Using three separate liquidity measures, I find that liquidity increases substantially following a write-off announcement. In univariate analysis, I find that bid-ask spreads, both relative and absolute, decline, and that the number of transactions increase following write-offs. Using a multivariate framework, after controlling for changes in price, volume, and volatility, I still find that liquidity improves following a write-off announcement. These results provide overwhelming evidence in favor of the information-asymmetry hypothesis.

Following the test of the information asymmetry hypothesis, it is important to see if there is any difference in the liquidity benefit from good governance write-off firms versus bad governance write-off firms. To test whether governance influences write-offs, I use a multivariate analysis that controls for the impact of price, volume, and volatility on spreads and number of transactions. I find that even when controlling for systematic changes, write-offs from companies with small boards, larger percent of outside directors, and strong shareholder protection will lead to a greater improvement in liquidity than companies with poor governance. As a robustness check, I also use analyst forecast error as a measure of information asymmetry, and find that write-offs, especially write-offs from well-monitored companies are related to a reduction in forecast error.

Finally, I decompose bid-ask spreads in order to measure the effect of write-offs on adverse selection costs. The adverse selection results confirm that write-offs improve the information asymmetry, and improve liquidity as a response. Adverse selection costs decrease significantly during the write-off announcement period in all three decomposition models. Overall, spread, number of transactions, and decomposition results suggest a picture where write-offs, especially those from good governance firms, improve the information environment and lead to a liquidity benefit for investors.

2.8 Tables

Table I   Sample Information

This table shows, by year, the number of write-off announcements for layoff based, asset based, and combined write-offs. It also shows the mean and median write-off charge by write-off type. The prior quarter's total assets to create a ratio adjust the write-off charge amounts. The mean and median of this ratio, Charge/TA, is shown. The charge amounts are in millions of dollars.

| | | Asset Write-offs | | | | Layoff Write-offs | | | | Combination Write-offs | | | |
| | | Charge | | Charge/TA | | Charge | | Charge/TA | | Charge | | Charge/TA | |
Year	#	Mean	Med.	Mean	Median	Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
1985	25	10.4	2.7	0.009	0.003	62.5	62.5	0.010	0.013	175.0	44.0	0.019	0.007
1986	34	44.8	6.7	0.024	0.012	3.5	3.5	0.034	0.013	44.7	13.2	0.013	0.005
1987	45	65.0	12.0	0.041	0.012	61.3	51.0	0.032	0.026	234.0	43.5	0.045	0.006
1988	44	11.2	5.7	0.009	0.002	67.4	34.2	0.030	0.009	122.0	12.2	0.033	0.007
1989	55	15.0	2.6	0.010	0.003	92.5	51.6	0.021	0.013	51.7	16.5	0.012	0.004
1990	53	41.7	13.7	0.010	0.006	147.0	139.0	0.032	0.013	88.8	35.0	0.026	0.005
1991	75	79.2	7.0	0.019	0.016	81.2	10.5	0.011	0.002	57.8	24.3	0.018	0.007
1992	68	36.5	25.0	0.029	0.006	82.6	48.0	0.021	0.015	108.0	49.5	0.022	0.010
1993	82	99.9	21.7	0.029	0.004	88.0	33.0	0.021	0.008	132.0	43.4	0.018	0.011
1994	82	134.0	13.6	0.021	0.017	35.1	18.0	0.011	0.005	129.0	49.5	0.022	0.012
1995	78	63.3	15.7	0.023	0.021	104.0	21.6	0.029	0.001	64.8	16.3	0.015	0.005
1996	85	69.3	42.9	0.058	0.007	40.5	1.9	0.049	0.002	109.0	29.8	0.016	0.008
1997	86	191.0	9.0	0.032	0.006	96.7	62.0	0.010	0.005	101.0	27.5	0.017	0.008
1998	86	28.6	16.2	0.016	0.005	30.6	15.0	0.049	0.002	100.0	30.6	0.019	0.007
1999	87	46.5	15.7	0.007	0.007	5.9	5.8	0.018	0.009	111.0	36.2	0.061	0.007
2000	90	79.6	16.5	0.014	0.004	63.2	62.4	0.006	0.007	66.2	27.9	0.022	0.011
All	1075	63.5	9.0	0.022	0.007	68.7	20.0	0.012	0.002	100.2	29.2	0.023	0.007

Table II   Summary Statistics

This table shows summary statistics on market and write-off activity for NYSE listed companies in the consumer manufacturing industry. The sample period spans 1993-2000. Comparative market statistics over the same period are given for the population of all non write-off firms on the NYSE.

	Write-off Companies	Non Write-off Companies
Average market capitalization	11,200,000	10,600,000
Average trading Volume	118,319	107,331
Average daily closing price	43.98	37.19
Average daily returns (with dividends)	0.02	0.01
Average size of write-offs, adjusted by total assets	0.01	
Percentage of companies with one write-off	25%	
Percentage of companies with second write-offs	21%	
Percentage of companies with third + write-offs	14%	

Table III   Liquidity ummary Statistics

This table shows summary statistics on liquidity measures for write-off periods versus surrounding non write-off periods. The write-off window is t=0 to t=25. The non write-off window ends 120 days before an announcement, and begins 120 after a write-off announcement. Volume is the total trading volume on a trading day. Returns is the returns over each trading day. Volatility measures the variance of returns. Price is the average daily transaction price. Absolute spread, relative spread, total number of transactions, number of ask transactions, and bid transactions are the averages for the absolute dollar bid-ask spread, the relative percent bid-ask spread, total number of transactions, number of ask transactions, and bid transactions. The t statistics are from the paired t-test for the differences in means between the write-off window, and the surrounding non write-off window. The sign test statistics are from the non-parametric sign test for the differences in the median measures between the write-off window, and the surrounding non write-off window. All p-values are reported based on two tailed significance. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively.

	WO Period		Non WO Period		Difference		Significance Tests	
	Mean	Median	Mean	Median	Mean	Median	Paired t-test	Sign test
Volume	248.13	160.8	229.27	134.82	18.86	25.98	-2.8**	0.00**
Price	33.74	31.54	35.91	33.09	-2.17	-1.55	6.41**	0.00**
Returns	0	0	0	0	0	0	-0.83	0.21
Volatility	0.4	0.49	0.39	0.46	0.02	0.03	-7.39**	0.83
Absolute Spread	0.28	0.19	0.37	0.19	-0.09	0	12.96 **	0.56
Relative Spread	0.01	0.01	0.02	0.01	-0.01	0	6.3 **	0**
Total Transactions	349.26	279.99	280.05	212.68	69.22	67.31	-15.15**	0**
Ask Transactions	164.92	131.96	133.97	100.15	30.95	31.81	-13.81**	0**
Bid Transactions	158.8	146.83	128.86	113	29.94	33.83	-16.11**	0 **

Table IV Univariate Analysis of Write-off Liquidity Changes to Earnings Liquidity Changes

This table looks at the univariate statistics for the change in liquidity when a company announces a write-off and when a company announces its quarterly earnings. Change is calculated as the difference between liquidity for a write-off firm, and all other firms on the NYSE on the announcement date. he t statistics are from the paired t-test for the differences in means between the write-off window, and the surrounding non write-off window. I compare the average values of changes in absolute spreads, relative spreads, and total volume for both the earnings and write-off announcement date. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively.

	WO change	Earnings change	t-value
Absolute Spread	-0.08	-0.04	-8.69 **
Relative Spread	-0.10	-0.006	-5.97 **
Turnover	52	30	8.67 **

Table V   Multivariate Analysis of Liquidity

This table shows the results of a regression of liquidity measures across write-off and non write-off periods, controlling for the effects of price, volume, and volatility.

$$Liquidity_i = \alpha + \beta WO_i + \gamma_1 Volume_i + \gamma_2 Price_i + \gamma_3 Volatility_i + \epsilon,$$

where $Liquidity_i$ is the dependent variable and stands for either the log of absolute spread, relative spread ,total number of transactions, or total number of transactions/absolute spread. Absolute spread is a measure of the average absolute dollar bid-ask spread of a sample firm. Similarly, relative spread and total number of transactions are the daily averages for the relative bid-ask spread, and total number of transactions. WO is coded with a one if the day is within 25 days following a write-off event, otherwise 0. Volume is the total trading volume during the trading day. Price is the average of all transaction prices recoded on the trading day. Volatility is the variance of returns over the trading day. All non-dummy variables are calculated by taking the natural logarithm. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively and all results are presented based on two-tail significance.

	Absolute Spread		Relative Spread		Total Trans.		Total Trans/Abs. Spread	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
WO	-0.098	-5.92**	-0.075	-2.05 **	0.194	11.97 **	0.129	3.32 **
Price	-0.029	-2.83	0.152	12.43 **	-0.014	-12.98 **	-0.203	-7.23 **
Volume	0.004	1.43 **	-0.008	-2.43 **	0.005	107.21 **	0.621	65.74 **
Volatility	-0.081	-23.95 **	-0.227	-55.38 **	0.598	2.73 **	0.028	3.89 **
Constant	-1.168	-31.63 **	-4.755	-109.35 **	2.521	55.91 **	4.727	48.43 **
F(4,7592)	165.42		777.96		6989.84		1157.98	

Table VI   Multivariate Analysis of Liquidity and Governance

This table shows the results of a regression of liquidity measures across write-offs and governance measures, controlling for the effects of price, volume, and volatility.

$$Liquidity_i = \alpha + \beta_{1-5}1GOV\_VARS_i + \beta_6 Volume_i + \beta_7 Price_i + \beta_8 Volatility_i + \epsilon_i$$

where $Liquidity_i$ is the dependent variable and stands for either the percent change in absolute spread, relative spread , total transactions, or total transactions/absolute spread. from the non write-off period to the write-off period . Absolute spread is a measure of the average absolute dollar bid-ask spread of a sample firm. Similarly, relative spread and total transactions are the daily averages for the relative bid-ask spread, and total number of transactions. Volume is the total trading volume during the trading day. Price is the average of all transaction prices recoded on the trading day. Volatility is the variance of returns over the trading day. All liquidity variables are calculated by taking the natural logarithm. BDSIZE is the size of the board of directors. PERCTOUT is the percent of outside directors on the board. GOV_INDEX is an index that ranks the level of shareholder protection for the shareholders, where the higher the number, the worse the protection. It is calculated using the Gompers, Ishii, and Metrick (2002) index. NEWCEO is a dummy variable that is one if there was a CEO turnover in the days following. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively and all results are presented based on two-tail significance.

	Absolute Spread		Relative Spread		Total Trans.		Trans./Abs. Spread	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Price	-0.24	-6.23 **	-2.64	-18.06 **	0.27	10.97 **	0.08	5.64 **
Volume	0.04	4.21 **	0.12	3.39 **	-0.03	-13.41 **	0.03	3.41 **
Volatility	-0.04	-2.62 **	-0.27	-5.26 **	0.55	9.67 **	1.05	104.61 **
BDSIZE	0.03	3.5 **	0.11	3.86 **	-0.12	-5.54 **	-0.02	-8.16 **
PERCTOUT	0.08	0.51	0.62	1.03	1.66	1.21	0.049	0.9
NEWCEO	-0.16	-3.48 **	-0.43	-2.4 **	0.28	2.99 **	0.05	3.02 **
GOV_INDEX	0.03	3.41 **	0.17	5.22 **	-0.07	-3.15 **	-0.03	-10.9 **
Constant	1.02	5.09 **	11.12	14.59 **	-4.96	-26.66 **	1.56	22.49 **
F(7, 3610)	101.29		129.41		1218.5		847.67	

Table VII   Liquidity and Number of Write-offs

This table shows the results of a regression of liquidity measures across write-offs and governance measures, controlling for the effects of price, volume, and volatility.

$$Liquidity_i = \alpha + \beta_{1-5}1GOV\_VARS_i + \beta_6 Volume_i + \beta_7 Price_i + \beta_8 Volatility_i + \epsilon_i$$

where $Liquidity_i$ is the dependent variable and stands for either the percent change in absolute spread, relative spread , or total Transactions from the non write-off period to the write-off period . Panel A shows the results for first time write-offs, while Panel B is for multiple write-offs. Absolute spread is a measure of the average absolute dollar bid-ask spread of a sample firm. Similarly, relative spread and total Transactions are the daily averages for the relative bid-ask spread, and total number of transactions. I also run the estimate for transactions divided by absolute spread. Volume is the total trading volume during the trading day. Price is the average of all transaction prices recoded on the trading day. Volatility is the variance of returns over the trading day. All liquidity variables are calculated by taking percent change in liquidity write-offs compared to the rest of the NYSE on that day. BDSIZE is the size of the board of directors. PERCTOUT is the percent of outside directors on the board. GOV_INDEX is an index that ranks the level of shareholder protection for the shareholders, where the higher the number, the worse the protection. It is calculated using the Gompers, Ishii, and Metrick (2002) index. NEWCEO is a dummy variable that is one if there was a CEO turnover in the days following. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively and all results are presented based on two-tail significance.

Panel A

	Absolute Spread		Relative Spread		Total Trans.		Trans./Abs. Spread	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Price	-0.24	-6.23 **	-2.64	-18.06 **	0.03	1.23	0.12	4.80 **
Volume	0.04	4.21 **	0.12	3.39 **	0.17	16.47 **	0.03	2.08 **
Volatility	-0.04	-2.62 **	-0.27	-5.26 **	0.03	4.62 **	0.96	47.87 **
BDSIZE	0.03	3.50 **	0.11	3.86 **	-0.05	-8.78 **	-0.02	-2.37 **
PERCTOUT	0.08	0.51	0.62	1.03	1.27	10.41 **	-0.46	-3.82 **
NEWCEO	-0.16	-3.48 **	-0.43	-2.40 **	0.22	5.88 **	-0.02	-0.56
GOV_INDEX	0.03	3.41 **	0.17	5.22 **	-0.01	-0.71	0.02	2.86 **
Constant	1.02	5.09 **	11.12	14.59 **	-2.50	-17.16 **	1.62	11.78 **
F(7, 3610)	101.29		129.41			155.36	819.9	

Panel B

	Absolute Spread		Relative Spread		Total Trans.		Trans/Abs. Spread	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Price	-0.03	-2.03 **	-0.58	-27.62 **	0.09	3.82 **	0.05	3.37 **
Volume	-0.05	-7.74 **	-0.05	-7.19 **	0.42	49.88 **	0.02	2.21**
Volatility	0.01	2.91 **	0.01	1.82	-0.01	-2.15 **	1.06	93.97 **
BDSIZE	0.01	3.09 **	0.01	1.81	0.05	10.55 **	-0.02	-6.69 **
PERCTOUT	0.16	2.47 **	0.08	2.47 **	0.73	7.62 **	0.21	3.49 **
NEWCEO	-0.05	-2.54 **	-0.09	-3.47 **	0.02	0.52	0.05	2.30 **
GOV_INDEX	0.01	0.49	0.01	1.84	-0.04	-7.82 **	-0.05	-14.05 **
Constant	-0.19	-2.16 **	1.90	17.45 **	-2.80	-22.62 **	1.59	19.97 **
F(7, 3610)	18.94		169.58		628.53		4107.66	

Table VIII   Liquidity and Size of Write-offs

This table shows the results of a regression of liquidity measures across write-offs and governance measures, controlling for the effects of price, volume, and volatility.

$$Liquidity_i = \alpha + \beta_{1-5}1GOV\_VARS_i + \beta_6 Volume_i + \beta_7 Price_i + \beta_8 Volatility_i + \beta_9 WO\_TA_i + \beta_{10}WO\#_i\epsilon_i$$

where $Liquidity_i$ is the dependent variable and stands for either the percent change in absolute spread, relative spread , or total transactions from the non write-off period to the write-off period. Absolute spread is a measure of the average absolute dollar bid-ask spread of a sample firm. Similarly, relative spread and total transactions are the daily averages for the relative bid-ask spread, and total number of transactions. I also run the estimate for transactions divided by absolute spread. Volume is the total trading volume during the trading day. Price is the average of all transaction prices recoded on the trading day. Volatility is the variance of returns over the trading day. All liquidity variables are calculated by taking percent change in liquidity write-offs compared to the rest of the NYSE on that day. BDSIZE is the size of the board of directors. PERCTOUT is the percent of outside directors on the board. GOV_INDEX is an index that ranks the level of shareholder protection for the shareholders, where the higher the number, the worse the protection. It is calculated using the Gompers, Ishii, and Metrick (2002) index. NEWCEO is a dummy variable that is one if there was a CEO turnover in the days following. WO_TA is the size of the write-off divided by total assets. WO# is the number of write-offs that the firm has taken from 0 to 26. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively and all results are presented based on two-tail significance.

	Absolute Spread		Relative Spread		Total Trans.		Trans./Abs. Spread	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
Price	-0.04	-3.04 **	-0.64	-33.33 **	0.01	0.45	0.082	5.93 **
Volume	-0.03	-6.37 **	-0.05	-6.54 **	0.29	49.71 **	0.03	4.08 **
Volatility	0.02	4.70 **	0.02	3.71 **	0.01	1.22	1.02	99.75 **
BDSIZE	0.01	5.05 **	0.01	3.68 **	0.04	12.86 **	-0.03	-9.86 **
PERCTOUT	0.11	1.82	0.04	0.52	0.32	4.70 **	0.18	3.10 **
NEWCEO	-0.06	-3.32 **	-0.07	-3.07 **	-0.01	-0.28	0.05	3.11 **
GOV_INDEX	0.04	0.98	0.03	0.99	0.01	-0.84	-0.04	-11.02 **
WO_TA	3.06	5.27 **	3.75	4.99 **	-0.49	-0.78	-3.56	-6.43 **
WO#	-0.01	-4.36 **	-0.02	-5.32 **	0.01	5.12 **	0.00	-0.82
Constant	-0.11	-1.42	2.13	21.32 **	-2.11	-25.44 **	1.614	23.11 **
F(7, 3610)	193.28		26.04		533.57			
	3839.25							

Table IX   Adverse Selection

This table shows the results of the adverse selection tests to see if write-offs reduce adverse selection. Lin Sanger and Booth (1995) develop a method of estimating empirical components of the effective spread, where the signed effective half spread, z_t, is defined as the transaction price at time t, P_t, minus the spread midpoint, M_t. The signed effective half spread is negative for sell orders and positive for buy orders. To reflect possible adverse selection information revealed by the trade at time t, Lin et. al (1995) add λ, which is the adverse selection component of the bid-ask spread. I follow Lin et al. (1995) by using a robust OLS to estimate the following equation:

$$\Delta M_{t+1} = \lambda z_t + \lambda_{WO}(z_t * WO_t) + \epsilon_{t+1},$$

where λ_{WO} is the incremental adverse selection component during the write-off period. The results are shown in Model 1. I also decompose the spread using the empirical model of Huang and Stoll (1997), and implemented by Weston (2000). The midpoint of the spread is defined as, M_t, and changes as a function of the direction of trades. An indication variable Q_t takes on the values, {-1,0,1} based on the direction of trade. If P_t¡ M_t, then $Q_t = -1$ (sell order), if $P_t = M_t$, then $Q_t=0$, and if P_t. M_t, then $Q_t=1$ (buy order). I follow Huang and Stoll (1997) by using a robust OLS to estimate the following equation:

$$\Delta M_t = \alpha(S_{t-1}/2)Q_{t-1} + \alpha_{WO}(S_{t-1}/2)Q_{t-1} * WO_t) + \epsilon_{t+1},$$

where α measures the proportion of the half spread $S_{t-1}/2$, that stems from information costs and α_{WO} is the incremental adverse selection component during the write-off period. Significance is indicated at the 0.05 and 0.01 levels by one and two asterisks respectively and all results are presented based on two-tail significance.

	ΔM_{t+1} - Model 1		ΔM_t - Model 2	
	Coefficient	t-value	Coefficient	t-value
Z	0.146	23.55		
Z*WO	-0.302	-23.34		
$(S_{t-1}/2)Q_{t-1}$			1.43	5.01
$(S_{t-1}/2)Q_{t-1}$*WO			-1.45	-4.61
R-squared	0.114		0.009	
F(2, 7623)	277.3		5.35	

Table X   Earnings and Write-offs

This table examines the earnings in the periods surrounding the write-off announcement. Panel A shows the earnings surprises, and Panel B shows the regression of the absolute value of forecast error on firm specific variables, where forecast error is defined as the absolute value of the median analyst estimate for the first earnings quarter following the write-off. Earnings data is from the First Call database. A * denotes significance at the 5 percent level, and ** denotes significance at the 10 percent level.

Panel A: Earnings Surprises				
Earnings Surprise				
	Mean	Median	t-value	Sign-rank test
Weak Monitors	-0.07	-0.02	-1.03	-1.30
Mediocre Monitors	-0.02	0.00	-1.97*	-2.26 **
Strong Monitors	-0.03	-0.01	-2.54**	-2.35 **
All Write-offs	-0.03	-0.01	-2.89**	-3.48 **

Panel B - OLSQ Results for Forecast Error		
	Coefficient	t-value
WO	-0.018	-3.40 **
SIZE	0.033	6.79 **
BDSIZE	0.026	5.16 **
PERCTOUT	-0.015	-5.35 **
GOV_INDEX	-0.001	-1.87
ACCRUALS	-0.001	-1.57
ROA	0.001	3.52 **
DEBT_RATIO	0.001	0.87
NEWCEO	-0.002	-0.51
GROWTH	0.004	0.92
CONSTANT	0.042	4.22 **

Tax Laws and Write-offs

Restructuring charges have become a popular topic with FASB. These charges are based on the big bath practice where firms take one-time charges to clean up their balance sheet. These charges include employee benefits, costs associated with discontinued operations, closed plants, product line elimination, and losses incurred from asset disposal and impairment. Many of these charges are not currently addressed by accounting standards, although some such as severance are. From a tax viewpoint, the main issue involved with these write-offs is the uncertainty of when these costs should be incurred.

Employee termination benefits or severance, are covered by accounting standards. EITF 94-3 applies to benefits to be provided to employees affected by layoffs. This liability is recognized in the period management approves the layoffs if the following criteria hold:

- Prior to the date of the financial statements, management approves of the termination benefits and specifies the amount to be paid out.

- Prior to the date of the financial statements, the details of the layoffs is communicated to the employees in sufficient detail.

- The termination plan specifies the number of layoffs, the job classification of the layoffs, and the specific departments.

- Changes in the plan are unlikely to occur.

Termination benefits that fall under the following criteria are not allowable as a write-off:

- Included with a disposal of a segment, which is also charged against earnings.

- Paid pursuant to the terms of an ongoing employee benefit plan.

- Paid under the terms of an individual deferred compensation plan.

Costs to exit an activity also have stated guidelines. When management commits to exiting an activity, exit costs are incurred. Exit costs include:

- Costs that are a direct result of the exit plan and that the firm would not incur without the plan.

- Costs that existed through a contractual obligation prior to the exit plan, like the penalty to break a lease.

The discontinued operations segment of an income statement consists of two parts. The first part is income (loss) from operations, and the second is gain (loss) on disposal of assets. Income (loss) from operations is disclosed for the current year only if the decision to discontinue operations is made after the beginning of the fiscal year. Gain (loss) from sale of assets is a combination of income (loss) from operations during the phase-out period and the gain (loss) from disposal of a segment. The gain (loss) on disposal includes costs arising from the decision, such as severance, additional pension costs, employee relocation expenses, and future rentals or leases.

If a loss is expected from the proposed sale or abandonment of a segment, the firm should provide for the loss it makes at the time the decision to dispose. If there is a gain, it should be recognized when the gain occurs. The results of discontinued operations appear as an independent line item on the income statement, before extraordinary items.

In addition to being disclosed in the financial statements, the footnotes should disclose the following:

- The segment of business that has been affected.

- The expected disposal date.

- A description of the remaining assets and liabilities of the segment.

- The expected manner of disposal.

- The income or loss from operations and any proceeds from the disposal of the segment.

Extraordinary items are sometimes used to disclose write-offs. An item is considered extraordinary if it is both unusual in nature and infrequent in its occurrence. An item is considered unusual in nature if it is unrelated to the line of business. To identify such items one needs to consider:

- Type and scope of operations.
- Line of business.
- Operating Policies.
- Industry.
- Geographic locale.
- Nature and extent of government regulations.

Accounting standards specifically note some items that can or cannot be included in extraordinary items. The following items are considered extraordinary:

- Gains or losses from extinguishments of debt, except for sinking fund requirements.
- Profits or losses resulting from the disposal of a significant part of the assets of previously separate companies.
- Write-off of operating rights of motor carriers.
- The investors share of an investees extraordinary item when the investor uses the equity method of accounting.
- Gains of a debtor due to a troubled debt restructuring.

Items that cannot be considered extraordinary are:

- Write-down or write-off of receivables, inventory, equipment leased, or intangible assets.
- Foreign currency gains or losses.
- Gains or losses from the disposal of a business segment.
- Gains or losses from sale or abandonment of property, plant, or equipment.
- Effects of a strike.
- Adjustments on accruals on long-term contracts.
  Extraordinary items are shown independently of ongoing operations and are shown net of taxes in a separate section of the income statement.

In 2002, FASB created new guidelines in its Statement 144 for restructuring charges. Unless the disposal activity involves a discontinued operation, costs associated with a disposal activity should be reported in continuing operations before income taxes in the income statement. If the disposal activity does involve a discontinued operation, then those costs should be included in discontinued operations.

The total amount of costs incurred and charged to expense should be reported by reportable segment. The accounting model for long-lived assets to be disposed of by sale applies to all long-lived assets, including discontinued operations. Statement 144 requires that those long-lived assets be measured at the lower of either carrying amount or fair value less cost to sell, whether reported in continuing operations or in discontinued operations. Therefore, discontinued operations can no longer be measured at net realizable value or include amounts for operating losses that have not yet occurred.

Statement 144 also broadens the reporting of discontinued operations to include all components of an entity with operations that can be distinguished from the rest of the entity and that will be eliminated from the ongoing operations of the entity in a disposal transaction.

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