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BID-ASK SPREADS AROUND EARNINGS ANNOUNCEMENTS: EVIDENCE FROM THE NASDAQ NATIONAL MARKET SYSTEM

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Abstract

Changes in bid-ask spreads are small around earnings announcements in general. However, there is evidence of a temporary increase in bid-ask spreads at the time earnings are announced for announcements that convey the most information, especially for announcements that are late and convey bad news. Good news releases (particularly when they occur earlier than expected) are associated with a larger trading volume reaction than bad news releases, which helps to explain the differential spread effects. Overall, the evidence indicates that those announcements that generate the most ex-post uncertainty among investors are associated with the largest spread effects.

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1. Introduction

Conventional wisdom suggests that earnings announcements resolve uncertainty about firm value by providing new information about the firm's cash flows to security-market participants. If earnings releases resolve uncertainty about the value of the firm, then the level of informational asymmetry that exists between corporate managers and stock market participants will be reduced by earnings releases. For example, Korajczyk, Lucas, and McDonald (1991) provide evidence that new equity issuances increase markedly in the period after quarterly earnings releases, and that firms almost never issue equity immediately before earnings announcements. This evidence suggests that earnings announcements reduce the level of information asymmetry in the stock market.[1]

In addition, some argue that earnings announcements, to the extent that they surprise investors, temporarily *increase* the level of informational asymmetry in the stock market (eg., see Kim and Verrecchia (1992)). Under this view, some traders, perhaps because they specialize in following the stock, are especially adept at processing the firm's earnings information. Consequently, if there is a large earnings surprise these traders are able to ascertain the implications of the surprise more quickly than other traders, providing them with a temporary informational advantage over those other traders and so temporarily increasing information asymmetry in the stock market.

This paper provides evidence on how bid-ask spreads change around the time of quarterly earnings announcements for a large sample of NASDAQ National Market System (NMS) firms. The objective is to provide evidence on the extent to which earnings announcements create or resolve uncertainty about firm value, where the level of the bid-ask spread proxies for uncertainty. Of course, the two stories described above are not mutually exclusive, since surprising earnings news may temporarily increase uncertainty in the market as the information is being impounded,

1. Korajczyk, Lucas, and McDonald argue that it is more costly for managers to issue equity when the level of informational asymmetry is high because the size of the stock price decline that tends to accompany the announcement of new equity issues increases with the level of informational asymmetry. Consistent with this, they find that the stock price decline that occurs when new equity issues are announced is less negative the smaller the time period between the announcement of the issue and the immediately preceding earnings release.

but then result in lower overall uncertainty after the information has been fully processed and all market participants share the same information. Evidence on how bid-ask spreads change around the time of earnings announcements is thus important, for while we know from many studies that earnings announcements convey information to the stock market, we know little about the economic process through which the market aggregates and assimilates earnings information.

There are two principal empirical results in the paper. First, there is weak evidence that average spreads are higher in the four weeks before earnings announcements than they are in the four weeks that follow earnings announcements. This evidence offers limited support for the idea that there is an "adverse selection" problem before earnings announcements, which is mitigated once the announcement is made (see Bagehot (1971) or Glosten and Milgrom (1985) for details of adverse selection in the context of market-making). Second, I document that spreads increase temporarily in the period immediately following earnings announcements that convey large earnings surprises, especially when those announcements are late and convey bad news. This result provides support for the idea that investors differ in their ability to process publicly available information, so that some earnings announcements temporarily increase the information asymmetry that exists between traders.2

Several previous studies use intraday data to examine the effect of earnings announcements on the microstructure of the market for New York Stock Exchange (NYSE) stocks. Barclay and Dunbar (1991) compare the market depth of NYSE stocks in periods before and after earnings announcements, and find no evidence that earnings announcements increase the liquidity of the market. Daley, Hughes, and Rayburn (1992) examine the effect of earnings announcements on the price effects associated with block trades and find a statistically significant, but economically small, reduction in the permanent price effects associated with block trades after earnings announcements. Lee, Mucklow, and Ready (1993) look at the effect of earnings

2. Chambers and Penman (1984) document that abnormal price variability persists for several days after earnings announcements that convey relatively large earnings surprises. They suggest that one explanation for this is that more information arrives at the market following the report: "For example, an early good news report or a late bad news report may spur further investigation of the firm by analysts" (p. 45).

announcements on quoted and effective NYSE spreads. Using half-hour intervals, they find a small increase in spreads in the hours before earnings announcements and a more noticeable increase in spreads at the time of the Broadtape announcement. Patel (1991) reports similar evidence. Finally, Venkatesh and Chiang (1986), using daily data on NYSE spreads, find that spreads increase before earnings or dividend announcements, but only if those announcements follow another earnings or dividend announcement by between 10 and 30 days.

Because intraday data allows researchers to pinpoint more precisely the time of earnings announcements and the related spread effects, the tests in papers such as Lee, Mucklow and Ready (1993) are, in one sense, more powerful than those that I present. On the other hand, however, there are at least three reasons that daily evidence for NASDAQ stocks may offer insights not available from these other studies. First, it is not obvious *a priori* what time frame one should use to test the adverse selection hypothesis. For example, it may be that information leakage in the days immediately before earnings announcements mitigates the adverse selection problem so that these effects are not detectable in the 24 hours before the announcement. Moreover, the evidence in Korajczyk, Lucas, and McDonald (1991) suggests that there are important adverse selection problems for *weeks* before earnings announcements, so a better test may be to compare spreads in the weeks before earnings announcements to spreads in the weeks after earnings announcements. In addition, I document below that bid-ask spread effects vary according to whether earnings news is released early, on time, or late. These partitions of the data are better performed using daily data because the evidence in Chambers and Penman (1984) and Kross and Schroeder (1984), as well as the evidence that I present below, indicates that the effects of reporting leads or lags are most pronounced for announcements that are one to two weeks early or late.

Second, the extant evidence suggests that if earnings announcements do affect the microstructure of the market for NYSE stocks, these effects are small in economic terms. For example, Lee, Mucklow and Ready (1993, table 5) find the largest spread effects (an 8% increase) in the half hour containing the earnings announcement. Using their numbers for quoted spreads (the results for effective spreads are similar), this result translates into an average spread increase of about two cents per share. One reason for the small magnitude of these effects may be that NYSE stocks are both relatively large and closely followed, which reduces the likely economic importance of any informational asymmetries. NASDAQ firms are smaller and less closely followed than the NYSE firms that these other studies investigate. As a result, informational asymmetries before and after earnings announcements, and the resulting changes in spreads, may be relatively larger and so easier to detect for firms listed on the NASDAQ.[3] The only study that examines bid-ask spreads around earnings announcements for NASDAQ firms is Morse and Ushman (1983), who find no evidence of a change in spreads around the time of earnings announcements. Because of data collection costs, their sample is limited to 25 firms and 378 quarterly earnings announcements over the 1973-1976 period. In contrast, the sample in this paper consists of approximately 700 firms and 13,000 earnings announcements drawn from 1983-1989.

Finally, institutional differences between the NASDAQ and the NYSE mean that results from stocks traded on the NYSE do not necessarily generalize to the NASDAQ. For example, Schwartz (1988, p. 63) argues that OTC dealers have "a strong informational advantage that the exchange specialists do not enjoy" because: (i) The OTC dealers take orders directly from customers, including institutional investors, and generally by telephone, "enabling the dealer houses to sense the motive behind an order," and (ii) Investment banking firms often make markets in the stocks of their clients, so that these dealers maintain close contact with the firms. On the other hand, centralized stock exchange specialists are able to more closely track the order

3. Currently intraday data are available only for New York and American Stock Exchange (NYSE-ASE) firms. However, there are problems with using these data to examine earnings announcement effects for relatively small NYSE-ASE firms. Lee, Mucklow and Ready (1993) use the same sample of NYSE firms as Lee (1992), who includes only relatively large NYSE firms. Lee restricts his sample to large firms because of the difficulty of obtaining reliable non-announcement period benchmarks for smaller firms that do not trade as often (because of the importance of time of the day effects in these data, it is necessary to obtain stocks that trade throughout the day in non-event periods, placing an important constraint on sampling).

flow than are decentralized OTC dealers, making it more difficult for informed traders to camouflage their trades on the NYSE.

The next section of the paper describes the sample of firms/earnings announcements along with the data. Section 3 provides evidence of how bid-ask spreads change around the time of earnings announcements. Section 4 provides a summary and conclusions.

2. Sample and data

The Center for Research in Security Prices Stock File (CRSP) covers NYSE, ASE, and NASDAQ stocks. However, data on bid-ask spreads are only available for NASDAQ National Market System (NMS) firms. Therefore, my sample is restricted to NASDAQ NMS firms. The sample consists of firms that meet the following requirements.

1. Listed on the NASDAQ NMS on or before January 1, 1985. This ensures both a reasonably large number of firms (the NMS was established in 1982 but only a handful of stocks were listed in that year) and earnings announcements per firm.

2. Earnings announcement dates available from either the Compustat Full-coverage or Primary-supplementary-tertiary Quarterly Industrial files.

3. Daily data available on the 1989 version of the CRSP Stock File.

A total of 1,234 firms were listed on the NASDAQ National Market System by 1985. Of these, there are 712 firms with earnings announcement dates available from Compustat. For the tests below, I use all available earnings announcements for these firms between the date they are listed on the NMS and December 1989. This yields a total of 15,462 earnings announcements for the 712 firms. The earnings announcements are spread fairly evenly in time from January 1983 through December 1989. Because the test procedures involve various, more stringent, data requirements, the number of firm-announcements on which I actually report in tables is less than 15,462.

The sample firms tend to be smaller than NYSE-ASE firms. The average (median) market value of equity for the NASDAQ NMS firms is \$243m (\$69m) compared with \$1,985m (\$151m) for NYSE-ASE firms.[4] The largest NASDAQ NMS firm falls in the 71st percentile of the size distribution of all NYSE-ASE firms, and the median NASDAQ NMS firm in the 34th percentile. There is also less cross-sectional dispersion in the size of the NASDAQ NMS firms than in the size of NYSE-ASE firms: the cross-sectional standard deviation for the size of the NASDAQ NMS firms is $542m (the range is $5,630m) compared with a standard deviation of $15,272m (and a range of $385,856m) for NYSE-ASE firms.

3. Evidence

In section 3.1 I provide evidence on how bid-ask spreads change around the time of earnings announcements in general. Section 3.2 then documents the relation between the magnitude of earnings surprises and changes in bid-ask spreads at the time of earnings announcements, while in section 3.3 I examine how these relations are affected by whether earnings news is released early, late, or on time.

3.1 Spreads Around Earnings Announcements in General

Panel A of table 1 reports average proportional bid-ask spreads for selected subperiods of the 41 trading day event window centered on the Compustat earnings announcement dates.[5] The spreads are calculated by dividing the closing dollar inside spread for each day (lowest closing ask quotation minus highest closing bid quotation) by the closing bid-ask midpoint on day -21. For the tests in this table (and throughout the paper) I require non-missing daily spread data for all 41 days in the event window. Table 1 reports results for the sample partitioned into firm size

4. These comparisons are based on these firms' closing market values on December 23, 1988. Of the 712 firms in the sample, 572 have non-missing market-value data on this date and are included in the comparison.

5. With a 41 trading day period centered on the day of the earnings announcement the event window comprises four weeks before the earnings announcement and four weeks after the earnings announcement. Because some firms release their first quarter earnings numbers only two months after their fourth quarter earnings announcement, this event period is the longest possible without risking overlapping event windows for consecutive quarterly announcements.

quintiles as well as overall.[6] Figure 1 plots the average daily spreads for the overall sample during the 41 day event window.

The evidence in table 1 and figure 1 indicates that, on average, spreads are remarkably stable around the time of earnings announcements. Over the entire 41 day event window, the range of the average daily spread for the overall sample is only .07 percent of stock price (varying between 3.19% and 3.26%), a small number in economic terms. Nevertheless, there is some evidence that spreads are unusually large in the period before earnings announcements, as one might expect if there were informational asymmetries in the period before earnings announcements. First, from figure 1 it is apparent that spreads steadily increase from day -7 through day 0, after which time they steadily decline for five days. Second, there is evidence that spreads are lower in the period after earnings announcements than they are in the period before earnings announcements. For the sample as a whole, the average spread is 3.25% for trading days -20 through -11, compared to an average spread of 3.21% for trading days +11 through +20, an overall decline of .04%. This change is statistically significant at the one percent level. The overall change is negative (although generally not reliably so) for all of the five quintiles. Once again, however, these trends in the data are small economically, casting doubt on the importance of the adverse selection story for earnings announcements in general.

The evidence in table 1 and figure 1 also indicates that there is a small increase in spreads at the time earnings are announced, which is consistent with the notion that some earnings announcements temporarily increase uncertainty about the value of the firm. Specifically, spreads are higher, on average, during the three day earnings announcement period (days -1, 0, and +1) than during either of the surrounding nine day periods. For the sample as a whole, the spread is 3.25% during the earnings announcement period, compared to an average of 3.23% over days -10 through -2 and an average of 3.22% over days +2 through +10. Both of these differences are

6. I obtain each firm's (calendar) year-end market capitalization directly from the CRSP Stock File and use the distribution of these market values to sort firms (and hence firm-announcement observations) into quintiles based on their relative market capitalization at the end of each year.

significant at the 5% level. These temporary increases are larger for the smaller sample firms, and are particularly pronounced for the firms in quintile 2, where both changes are significant at the one percent level and (relatively) large.

One difficulty with the univariate evidence in table 1 is that it does not control for the effect of other changes that occur around the time of earnings announcements. There is evidence that: (i) stock market trading volume increases at the time of earnings announcements, and (ii) changes in trading volume are associated with changes in bid-ask spreads.[7] To control for the effect of trading volume on spreads I estimate, for a randomly chosen subsample of earnings announcements, time-series regressions of standardized spreads on standardized trading volume. Specifically, for 2,784 earnings announcements,[8] I estimate the following time-series regression equation:

$$Spd_t = \alpha_0 + \alpha_1.Indicator_t + \beta_1.Vol_t + \beta_2.Vol_{t-1} + e_t$$

where

Spd_t is the ratio of the bid-ask spread on day t to the average bid-ask spread calculated over days -20 through +20 (after excluding days -1, 0, +1) minus one; and

Vol_t is the natural logarithm of the ratio of trading volume on day t to median trading volume calculated over days -20 through +20 (after excluding days -1, 0, +1).

To test whether spreads are unusually high during earnings announcement periods I also include an indicator variable that takes a value of one for days -1, 0, +1, and zero otherwise.

7. The evidence on increases in trading volume around earnings announcements dates from Beaver (1968), and includes more recent papers by Morse (1981) and Bamber (1986). The evidence on the relation between volume and spreads indicates that, across firms, higher volume is associated with lower bid-ask spreads. See, for example, papers by Tinic and West (1974), Branch and Freed (1977) or Stoll (1978).

8. I randomly choose one of out of every five earnings announcements to be included in this subsample. Of these announcements, the 2,784 firm-announcement subsample comprises those announcements with complete data on spreads and volume over the 41 day estimation period.

Descriptive statistics on the estimated coefficients from these regressions are reported in table 2. These are ordinary least squares (OLS) regressions. I also estimate these regressions using time-series techniques because there is some evidence of autocorrelation in the residuals of the OLS regressions. To do this I use the SAS AUTOREG procedure assuming that the residuals follow a fourth order autoregressive process (which removes virtually all of the autocorrelation). There is little difference in either the parameter estimates or in their statistical significance when I use these more sophisticated time-series techniques.

The evidence in table 2 indicates that, after controlling for trading volume changes around earnings announcements, spreads increase significantly at the time of earnings announcements. The coefficient on the indicator variable indicates that, on average, spreads increase by 1.4% during earnings announcement periods relative to their non-announcement levels, a number that is about twice a large as the overall increase in table 1.[9] This difference occurs because the normal relation between volume and spreads is negative, so that failing to control for the volume increases that occur at the time of earnings announcements biases against finding an increase in spreads at that time (as noted earlier, previous studies find a negative relation between spreads and volume in the cross-section, and generally attribute this relation to lower inventory holding costs for higher volume stocks).

To summarize, for the sample of earnings announcements as a whole, I find weak evidence that bid-ask spreads are unusually large in the period before earnings announcements, casting doubt on the empirical importance of adverse selection in the period before earnings announcements. There is stronger evidence of a temporary increase in spreads at the time earnings news is released, which is consistent with the idea that some earnings announcements create uncertainty for a short period of time. I investigate this hypothesis in more detail next.

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9. The 1.4% number comes from the regressions that include the indicator variable and the two volume variables. Looking at table 1, the average non-announcement spread is 3.228% and the average announcement period spread 3.250%, so that spreads increase by about 0.7% at the time of earnings announcements.

3.2 Spreads Around Earnings Announcements and Large Earnings Surprises

If there are informational asymmetries around earnings announcements that impact bid-ask spreads, these effects should be largest for those earnings announcements that convey the most information to the stock market. For example, it may be that surprising earnings news stimulates additional analysis by money managers, security analysts, and other "informed" traders, who are thus able to assess the implications of the earnings news more quickly than are other traders, providing them with a temporary informational advantage. In this section I partition the sample of earnings announcements according to the magnitude of the earnings news that they convey, and examine whether the bid-ask spread changes are largest for those announcements that convey the most news.

Table 3 presents evidence on the sample of earnings announcements from table 1, but where the announcements are partitioned according to the magnitude of the earnings news that they convey. I measure the magnitude of the earnings news as the market-adjusted stock return cumulated over the two-day announcement period (days -1 and 0), where the daily returns are calculated using the midpoint of the closing daily bid and ask quotes and the market return is the CRSP NYSE-ASE equally-weighted market return. I have also performed the tests in table 3 using a seasonal-random-walk model to measure the earnings surprises with similar, but weaker, results. Because the seasonal-random-walk model is based on information that is about a year old at the time of the earnings announcement, there is likely to be relatively more measurement error in this earnings surprise proxy, so the weaker results for this measure are expected (see Brown et al. (1987) for evidence consistent with this).

In table 3 I partition the sample of earnings announcements into ten deciles according to the magnitude of the earnings surprise. Decile one contains those announcements that convey the worst news (the average abnormal return associated with these announcements is -10.3%) while decile ten contains those announcements that convey the best earnings news (the average abnormal return associated with these announcements is +9.1%). (On average across the entire sample the abnormal returns are negative: the mean abnormal return is -.31% and 54% of the abnormal returns are negative.) To contrast the results for the extreme good news and bad news deciles, figure 2 plots the average event period spreads for these two groups of announcements.

The results in table 3 indicate that the spread changes are largest for the earnings announcements that convey the most news, especially where that news is bad news. For the announcements that convey the worst news (those in decile one), spreads increase by 0.22% at the time of the earnings announcement (an increase of 5.7% compared to the period immediately before the announcement) and decrease by 0.23% immediately thereafter. Both of these changes are significant at the one percent level and are substantially larger than the corresponding changes for the overall sample in table 1. There is a similar, but smaller, result for the announcements in decile 2: spreads increase by 0.09% at the time of the earnings announcement (an increase of 2.6% compared to the period immediately before the announcement) and decrease by 0.10% immediately thereafter, and the changes are again statistically significant.

The results are not nearly as pronounced for the good news announcements. For the announcements in decile ten spreads increase by 0.16% at the time of the earnings (which represents an increase of 4.4% relative to the period immediately before the announcement), which is statistically significant at the one percent level. However, there is no corresponding decrease in spreads after these announcements, and there are no significant announcement-period spread changes for the announcements in decile nine (or in any other decile). Overall, this evidence suggests that the small temporary increase in spreads in table 1 is attributable principally to announcements that convey relatively large negative earnings surprises.

The overall decline in spreads is also more pronounced for the bad news announcements. For the announcements in deciles one and two spreads are reliably lower in the period after earnings announcements than in the period before earnings announcements: for the announcements in decile one the overall decline is 0.10% (significant at the five percent level) and for the announcements in decile two the overall decline is 0.13% (significant at the one percent level). No other overall changes are reliably different from zero. Thus, the small overall decline in spreads in table 1 appears to be primarily due to the bad news announcements, suggesting that the adverse selection story may be more important for this set of announcements. I return to this below.

Consistent with other studies, the firm size information at the bottom of table 3 indicates that there is a negative relation between firm size and the magnitude of earnings surprises. The firms in deciles one and ten are the smallest firms in the sample, followed by the firms in decile two (the Spearman correlation between firm size and the absolute value of the earnings surprises, calculated across all firm-announcements, is -.09, which is reliably negative at the one percent level). This suggests that the effect of large earnings surprises on bid-ask spreads could be due to the effect of firm size. However, when I calculate Spearman correlations between the announcement period increase and decrease in spreads, the absolute value of the earnings surprise, and firm size, I find statistically significant correlations between the absolute value of the surprise and the announcement-period increase and decrease in spreads (of .075 and -.068 respectively) but no correlation between firm size and the spread changes (these correlations are -.01 and .01 respectively and are not statistically significant). This indicates that it is the magnitude of the earnings surprise and not firm size *per se* that matters in explaining the spread changes.

To investigate whether the apparent relation between changes in announcement-period spreads and the magnitude of earnings surprises is affected by trading volume, I divide the sample of firm-announcement regressions from table 2 into two groups according to whether the announcement is associated with an earnings surprise that is larger or smaller than the median for this subsample of earnings announcements (I use the absolute value of the abnormal announcement period stock-return to measure the size of the earnings surprise). The results (not reported in tables) confirm that larger surprises generate larger spread effects, after controlling for the effect of trading volume. For the subsample of announcements that generate large earnings surprises the average coefficient on the indicator variable is 3.2% ($t = 4.9$) while for the subsample of small surprise announcements the average coefficient is -0.9% ($t = -1.4$). A two-sample t test confirms that the difference in means is reliably different from zero.

There are several possible explanations for the asymmetric results in table 3. First, the results generally are consistent with the argument that larger earnings surprises temporarily increase the informational advantage of "informed traders" because these traders can ascertain the pricing implications of the earnings news more quickly than other traders (as in Kim and Verrecchia (1992) for example)). However, unless bad news announcements are somehow inherently "more surprising" than good news announcements (so that they offer these informed traders a relatively larger informational advantage), this argument does not explain why the spread effects are more pronounced for the bad news announcements.[10]

A second possible explanation is that the bad news firms experience a decline in stock price prior to the earnings announcement (whereas the good news firms experience an increase in stock price), and, since proportionate spreads are inversely related to price, naturally experience an increase in their proportionate spreads. Apparently consistent with this, the bad news firms in deciles one and two tend to be smaller than the good news firms in deciles ten and nine respectively (see the market capitalization data reported at the bottom of table 3). However, all of the proportional spreads that I report are calculated using a denominator that is constant throughout the 41 trading day event window (I use the bid-ask midpoint on day -21 to deflate the dollar spread on each event day), making this explanation less likely. Moreover, this explanation also predicts a decline in announcement-period spreads for the good news announcements, which is inconsistent with what I find in table 3.

Third, differences in the magnitude of the trading volume reaction to the announcement of good and bad earnings news may cause differential effects on the bid-ask spread, given the negative relation between trading volume and spreads documented above. Holding the magnitude of the surprise constant, there may be a smaller trading volume reaction to bad news

10. Holthausen and Leftwich (1986) find that announcements of bond rating downgrades by Moody's and Standard and Poor's are associated with reliably negative abnormal returns but that there is little evidence of abnormal returns around the time bond rating upgrades are announced. This suggests that bad news may, in fact, be inherently more surprising to the stock market, although there are other explanations for the Holthausen and Leftwich results (eg., there may be differences in the extent to which the market anticipates the upgrade and downgrade announcements).

announcements than to good news announcements because of institutional factors such as limitations on short-selling or the simple fact that when the news is bad investors who do not hold the stock cannot sell it, whereas all investors can purchase stocks after good news is announced. Alternatively, surprisingly bad news may generate less post-announcement liquidity trading if bad news is more likely to generate uncertainty among uninformed traders than good news.

Table 4 compares abnormal trading volume around the time of earnings announcements for announcements that convey good and bad news. In this table good news announcements are defined as those that generate an abnormal announcement-period stock return of at least +2% while bad news announcements are those for which the abnormal return is -2% or less. Notice that defining good and bad news in absolute terms in this way results in a larger sample of bad news announcements (N = 3,752) than good news announcements (N = 3,279) so that this sample is characterized by relatively more bad news. I calculate abnormal trading volume for each firm-announcement as daily trading volume less median non-announcement period trading volume.[11] To assess the statistical significance of the abnormal volume measures, I report (in parentheses) Z-statistics from a large-sample approximation to the Fisher sign-test (see Hollander and Wolfe (1973, pp. 39-40)).

The results in table 4 (also plotted in figure 3) indicate that there is a larger trading volume reaction to good news earnings announcements than to bad news earnings announcements. This difference is both economically and statistically significant. For the bad news announcements trading volume is 56% above normal levels on day -1, 78% above normal levels on day 0, and 41% above normal levels on day +1. For the good news announcements the volume reaction is substantially larger: trading volume is 87%, 135%, and 64% above normal levels on days -1, 0, and +1, respectively. All of these differences (between the good and bad news announcements)

11. The non-announcement period is defined as the 80 trading-day period comprising days -50 through -11 and +11 through +50 relative to each Compustat earnings announcement date. For each event day I report the median (across all firm-announcements) of these numbers, deflated by median non-announcement period volume to yield a percentage increase or decrease. Bamber (1986, p. 43) reports that this type of simple firm-specific median-adjustment yields inferences similar to those from market-model-type adjustments.

are statistically significant at small probability levels. Moreover, a statistically significant difference of the same sign persists on days +2 and +3 as well, and is also present on day -2.

There are at least two ways in which the differential trading volume reaction may impact spreads. First, if the higher volume after good news announcements is indicative of relatively more "uninformed" or "liquidity" trading after these announcements, dealers may be less concerned about trading against those with information superior to their own after these announcements, allowing them to set lower spreads. Second, the relatively lower spreads after good news announcements may simply reflect the normal negative relation between spreads and volume (eg., Stoll (1978)). In either case, the differential volume reaction to good and bad news announcements is an interesting new regularity and seems likely to be important in explaining the differential spread effects for the two sets of announcements.[12]

To investigate whether, after controlling for the differential volume effects, bad news announcements still generate larger spread effects, I once again estimate announcement-specific time-series regressions of standardized spreads on standardized volume (as in table 2). In this case I estimate regressions for the for the set of good and bad news announcements from table 4, and examine whether the average coefficient on the indicator variable differs between the two groups of announcements. The evidence (not reported in tables) indicates that the average coefficient is the same for the good and bad news announcements. For the bad news announcements the average coefficient is 3.33% (t = 7.8) while for the good news announcements that average coefficient is 3.41% (t = 7.7). The t-statistic from a difference in means test is .14. Thus, the differential volume associated with good and bad news announcements appears to fully explain the differential spread effects. (Nevertheless, the question of why these announcements generate such different volume effects remains.)

12. Lee (1992) provides evidence that small trades after earnings announcements tend to be buyer-initiated, even if those announcements convey bad news. In contrast, large trades are generally buyer-initiated after good news and seller-initiated after bad news. This evidence suggests that there are two categories of trading after earnings announcements (informed and uninformed?) and is also indicative of an asymmetric trading response to good and bad news earnings announcements.

As a further check on the robustness of these results, I also examine the cross-sectional relation between changes in the spread, the size of the surprise, and trading volume. Specifically, for all firm-announcement observations with available data I regress the announcement-period increase in spreads on the size of the surprise and the abnormal trading volume associated with the announcement, with the following results (I also include a measure of firm size to control for any potential size effects):

$$\begin{array}{llllll} Incr_{it} = & .0001 + & .024.|Surp_{it}| - & 1.7*10^{-5}*Abvol_{it} - & 5.2*10^{-5}*\ln(Mktcap_{it}) & \text{Obs.} = 11{,}282 \\ (t =) & (.08) & (8.46) & (-2.02) & (-0.61) & \text{Adj. } R^2 = .63\% \end{array}$$

These results indicate that, first, consistent with the previous results, larger surprises are associated with larger announcement-period increases in the spread. Second, the coefficient on abnormal volume is reliably negative at the five percent level indicating that, after controlling for the size of the surprise, larger announcement-period volume tends to be associated with lower spreads. This result is consistent with the idea that, for a given level of uncertainty, relatively more announcement-period volume (perhaps because it is associated with relatively more uninformed trading) reduces the dealers' risk so that, in competition, dealers set lower spreads.

Overall, the evidence here indicates that larger earnings surprises tend to be associated with larger increases in announcement-period spreads. Although the unconditional effect is more pronounced for announcements that convey bad earnings news, I also document a larger trading volume reaction to good news announcements than to bad news announcements. Since bid-ask spreads and trading volume are negatively related, this differential trading volume reaction explains the larger announcement-period spread effects for the bad news announcements. Nevertheless, the evidence indicates that differences between the way that the market reacts to good and bad news announcements remain (apart from the volume difference, the tendency for spreads to be lower after earnings announcements is attributable principally to the bad news announcements).

A final possible explanation that the results for the good and bad news announcements are different is that there is something systematically different not about the news itself, but about the way in which the news is reported. Chambers and Penman (1984) and Kross and Schroeder (1984) report that there is a systematic difference between when good and bad earnings news is announced: they find that good news tends to be reported earlier than the date on which the announcement is expected while bad news tends to be reported later than the date on which the announcement is expected. Thus, managers appear to accelerate the release of good news and delay the release of bad news. If these effects are also present in my sample, they may cause the market to differentially anticipate and/or react to the release of the news itself, resulting in different spread and volume effects. For example, if news is announced earlier than expected there may be less of an adverse selection problem prior to the release than if the earnings announcement is delayed. I investigate this in the next section of the paper.

3.3 Changes in Bid-Ask Spreads and the Delay of Bad News

To investigate whether there is a relation between the nature of earnings news and the timing of earnings announcements in my sample, I first compare actual earnings announcement dates with expected earnings announcement dates. Following Chambers and Penman (1984), the expected earnings announcement date for a particular firm-quarter is defined as the date on which that firm announced earnings for the corresponding quarter in the previous year. Summary statistics for the difference between these expected announcement dates and the actual announcement dates indicate that, consistent with the results in Chambers and Penman, earnings announcement dates are highly predictable. For example, across all firms in the sample the mean (standard deviation) of the within-firm standard deviation of the difference between the actual and reported dates is only 5.5 (2.9) trading days. The corresponding statistics for the within-firm range are 22.5 (11.7) trading days. These numbers are similar to those that Chambers and Penman (1984, table 1) report and suggest that last year's earnings announcement date is generally a reliable measure of this year's expected date.

I next investigate whether there is a relation between the timing of the earnings announcement and the nature of the earnings news. To do this I classify the announcements into three categories -- early, late, and on time -- according to whether the announcement is more than five trading days early, more than five trading days late, or somewhere in between. The choice of a five day cutoff is somewhat arbitrary but results in approximately 12% of the observations being classified as early, 10% as late, and 78% as on time, so that early and late reports are relatively unusual. The five day cutoff also corresponds to the average within-firm standard deviation noted above. I have tried a seven day cutoff with similar results.

The results (not reported in tables) indicate that there is a strong relation between the nature of the earnings news and the timing of the announcement, and that the association is in the same direction as what Chambers and Penman (1984) and Kross and Schroeder (1984) report. The average (median) abnormal return associated with the early, on time, and late announcements is 0.65% (0.12%), -0.29% (-.20%), and -1.27% (-0.59%), respectively, and 48.5%, 54.3%, and 60.6% of the abnormal returns, respectively, are negative. The pairwise differences between these three sets of numbers are all highly statistically significant using two-sample t and Wilcoxon tests. In addition, the Spearman correlation between the difference between the actual and expected dates and the abnormal returns is -.10, which is reliably negative at the one percent level. Overall, there is evidence that earnings announcements that convey bad news tend to be delayed while good news tends to be announced before it is expected, which is consistent with the results in the previous papers. I now examine the implications of this result for bid-ask spreads.

Table 5 partitions the sample of earnings announcements into nine groups according to whether the announcements convey good, bad, or intermediate news, and whether the announcements are early, late, or on time. Once again, I classify announcements as conveying good news if the abnormal stock return that accompanies the announcement is greater than or equal to +2%, and as conveying bad news if the abnormal return is -2% or less. All of the remaining announcements are classified as conveying intermediate news. As above, the five day cutoff is used to assess whether the announcement is early, late, or on time.

There are several features of the evidence in table 5. First, the market capitalization data at the bottom of the table indicate that there is a relation between firm size and when earnings news is reported -- firms that report on time are larger than those that report early or late, so that larger firms have more stable reporting schedules. Second, there is evidence that spread effects around earnings announcements are related to both the nature of the news and to the timing of its release. Specifically, although the temporary increase in announcement-period spreads is statistically significant for bad news regardless of whether it is released early, late, or on time, the effect is most pronounced when bad news is delayed. When bad news announcements are late, average spreads increase by 0.26% (around 5.6%) at the time of the announcement and decrease by 0.39% (around 8.4%) immediately thereafter. These numbers are around three times larger than the changes for the bad news announcements generally (see table 3). More specifically, the corresponding spread changes are about half as large when the bad news is announced early, and about half as large again when the bad news is announced around the time that it is expected, although all of the spread changes for the bad news announcements are statistically significant.[13]

There is no evidence of any temporary announcement period increase in spreads for the set of earnings announcements that convey intermediate news. For the good news announcements there is evidence of a statistically significant increase in spreads, but only for the on time announcements (although recall that the good news announcements tend to generate a larger trading volume reaction than the bad news announcements, which helps to explain the different results). Interestingly, the magnitude of the temporary increase in spreads at the time of the on-time good news announcements is about the same as that for the on-time announcements that convey bad news. Thus, the larger spread effects associated with bad news announcements are attributable to those announcements whose timing is also surprising, and especially to the bad news announcements that are late. Conversely, it is the early good news announcements that are

13. These differences are not likely to be due to differential trading volume effects. As the evidence at the bottom of table 5 indicates, the trading volume reaction to bad news is about the same for the early, late, and on-time announcements. (In contrast, trading volume is substantially larger for the early good news announcements (+343%) than for the on-time or late announcements that convey good news (+283% and 240% respectively)).

associated with the largest volume effects (and no spread effect), indicating that--unlike late bad news--these announcements generate a lot of trading but relatively little uncertainty among traders. Overall, the evidence in table 5 indicates that the largest spread effects occur for bad news that is delayed, but that bad news generally is associated with a temporary increase in announcement-period spreads. In contrast, for good news announcements temporary spread increases are detectable only for those announcements that are on-time.

The results in table 5 indicate that it is the late bad news announcements that generate the most ex-post uncertainty, in that they are associated with the largest temporary increase in bid-ask spreads. This result is intuitive in the sense that earnings releases that are both bad news and late are likely to be associated with the most additional research and inquiry by investors that follow the firm's stock.[14] This follows because late bad earnings news is that which is most likely to arouse investor suspicion about the possibility of other associated negative events such as disputes with the firm's auditors over questionable accounting methods, internal management disagreements over same, SEC enforcement actions, etc. In other words, if bad news is delayed it may be a signal that the firm's managers have something to hide and that investors have to be especially cautious about taking the announced numbers at face value. In contrast, early good news appears to generate a large amount of trading without creating much uncertainty in the market. Overall, the results are consistent with the idea that it is those earnings announcements that generate the most ex-post uncertainty and research that are those that generate the largest spreads effects.

Finally, one might expect the adverse selection problem before earnings announcements to become more severe the later the announcement date is relative to the date on which it is expected. In particular, once the expected announcement date passes without any news, dealers may become particularly concerned about potential informational asymmetries, especially if (as

14. There is anecdotal evidence that after surprising earnings news (especially bad news) firm managers participate in a conference call with a select group of analysts to explain more fully the implications of the earnings news and answer analysts' questions, providing these individuals with a better understanding of the implications of the surprise.

tends to be the case) late news tends to be bad news. There is some limited evidence in favor of this hypothesis in table 5. For late bad news the decline in spreads immediately after the announcements is 0.39%, which is larger than the corresponding announcement-period increase in spreads (of 0.26%), indicating that spreads in the period immediately before the announcement were abnormally high (the average spread just before these announcements is 4.66%, which falls to 4.53% just after the announcement, a change that is significant at the ten percent level (two-tailed test)). In addition, the overall change in spreads for this subsample is -0.11%, which (although not significant), is the largest decline in the table. Overall though, the evidence in favor of adverse selection before earnings announcements is not very strong.[15]

4. Summary and Discussion

This paper documents that, for earnings announcements in general, there is a small temporary increase in spreads at the time that earnings are announced and that spreads are somewhat lower in the period after earnings announcements than in the period before earnings announcements. These overall spread changes are small in economic terms. However, most earnings announcements do not convey a great deal of information to the stock market -- the majority of announcements occur at about the time they are expected and generate relatively small changes in stock prices. I find stronger evidence of spread changes immediately after earnings announcements when I examine those announcements that are likely to generate the most ex-post uncertainty among investors. In particular, I find relatively large changes in spreads for earnings news that is announced later than expected and that conveys bad news, although it is generally the case that bad news announcements are associated with larger spread effects than good news announcements of about the same magnitude. Overall, there is evidence of a temporary increase

15. I have also investigated abnormal trading volume for these announcements in the period before earnings are announced. If there is an important adverse selection problem before earnings announcements, one might expect that volume would be abnormally low in the period before earnings announcements as uninformed traders postpone their trades until after the uncertainty is resolved (see French, Leftwich and Uhrig (1989) for evidence that is consistent with this in the context of futures markets). However, I find no evidence of this for the late bad news announcements, or for any of the other subsamples of earnings announcements.

in bid-ask spreads immediately after surprising earnings news is announced. This evidence suggests that surprising earnings news temporarily creates differences in the information available to investors after earnings announcements, perhaps because investors differ in their access to private information about the implications of earnings surprises.

There are at least two possible explanations that the results differ for the good and bad news announcements. First, I find that the trading volume reaction to good news announcements is substantially larger (50-70 percent) than the trading volume reaction to bad news announcements. This result is especially pronounced for good news that is released early. The extra volume immediately after good news announcements may allow dealers to set relatively lower spreads after these announcements, either because of relatively lower inventory holding costs or because of a relatively lower risk that they are trading against traders with information superior to their own. Consistent with this, I find that the difference in the announcement-period spread effect disappears after controlling for the differential volume. Second, it may be that by its very nature bad news generates more uncertainty (and so generates more post-announcement research) than does good news. The result from Chambers and Penman (1984) and Kross and Schroeder (1984), also documented here, that bad news announcements tend to occur later than expected while good news announcements tend to occur earlier than expected is consistent with this idea.

The evidence that I report is related to the evidence in Watts (1990). Watts finds that more surprising earnings announcements (those with relatively large analyst forecast errors) are more likely to be made when the exchange is closed and that this tendency is more pronounced for firms with less liquid markets for their stocks.[16] She argues that managers have incentives to maintain the liquidity of the market for their firm's shares and, as a result, prefer to release extremely surprising news after markets are closed. Managers would only do this if they believed

16. Patell and Wolfson (1982) find that bad news is more likely to be released after the close of trading and Brown, Clinch, and Foster (1991) find that bad news is more likely to be released after the market closes on Fridays, suggesting that managers are concerned about the announcement effects of bad news announcements. However, Watts finds no relation between the sign of the news and the time of its release.

that large earnings surprises reduced the liquidity of the market for their firm's stocks, as the results in this paper suggest.

Finally, the evidence in this paper has implications for papers that examine the extent to which investors become privately informed prior to public information releases such as earnings announcements (eg., see recent papers by Demski and Feltham (1993) or McNichols and Trueman (1993)). I find little evidence that bid-ask spreads are unusually high before earnings announcements, suggesting that few traders have valuable private information prior to these releases. This is consistent with the evidence for corporate insiders in Seyhun (1992), who finds: (i) that, in general, insiders do not exploit the information in upcoming earnings announcements, and (ii) that the extent to which insiders do take advantage of the information in earnings announcements has declined over the 1980s, even though the overall level of insider trading has increased over that time period. Seyhun attributes the latter result to changes in case law that have increased the costs of insider trading before public information releases. In a similar vein, Fama (1991) reviews several studies and concludes that there is little support for the idea that professional investment managers have access to valuable private information. Overall, the evidence here, as well as that from other studies, suggests that the costs of obtaining and trading on valuable private information prior to earnings announcements likely exceed the benefits.

Figure One: Overall Average Spreads Around Earnings Announcement Dates

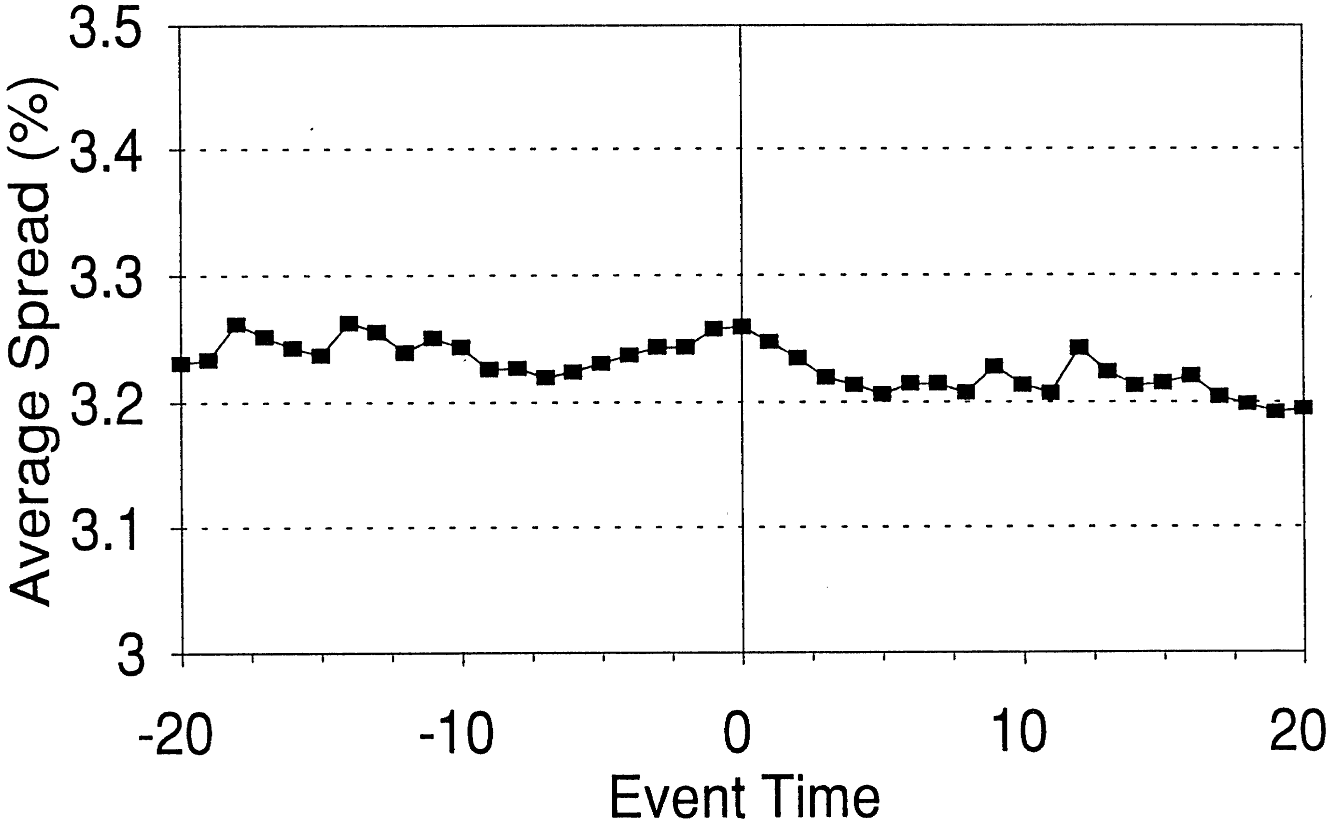

Figure Two: Average Spreads for Good and Bad Earnings News

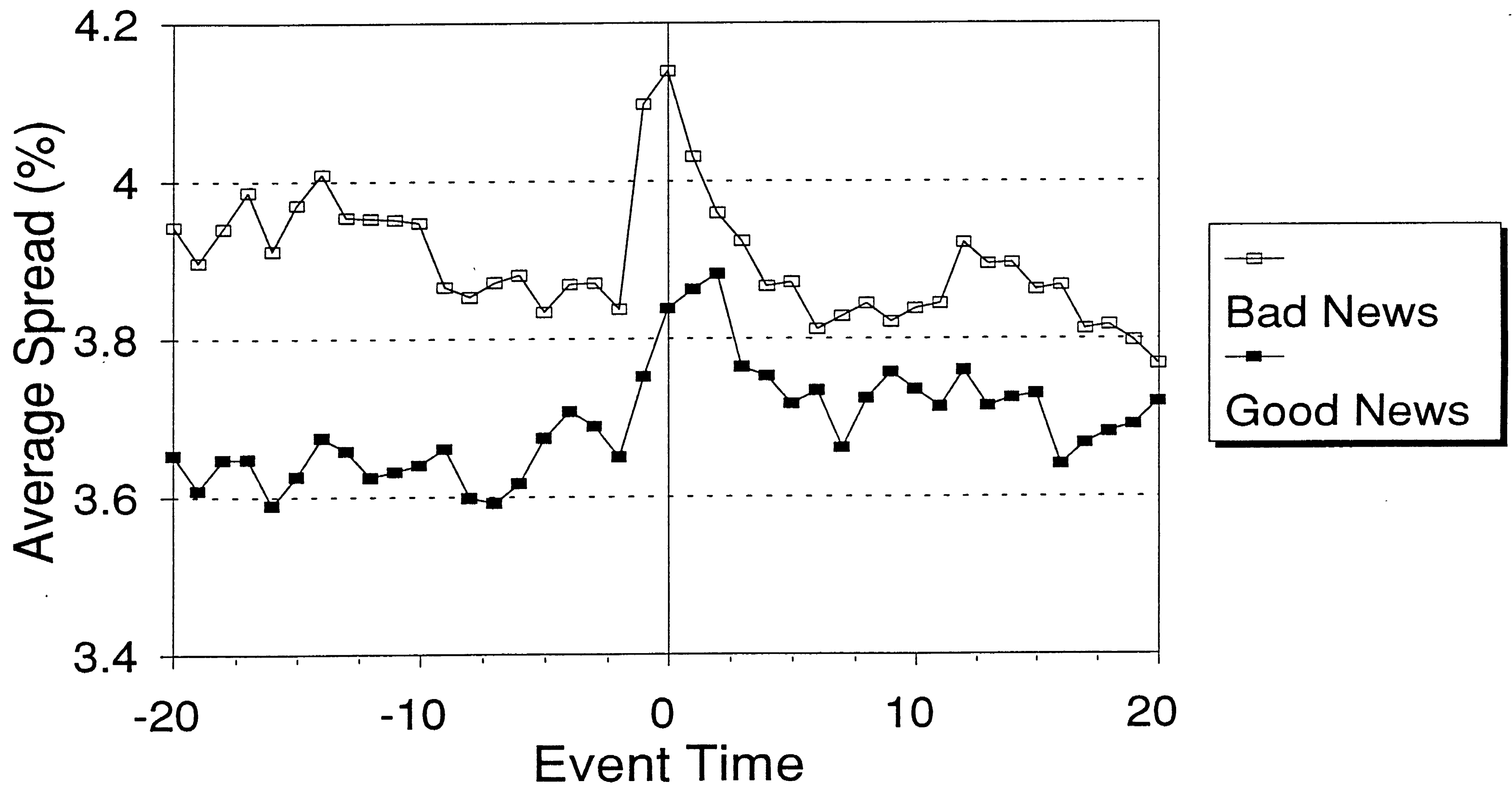

Figure Three: Abnormal Volume -- Good vs. Bad Earnings News

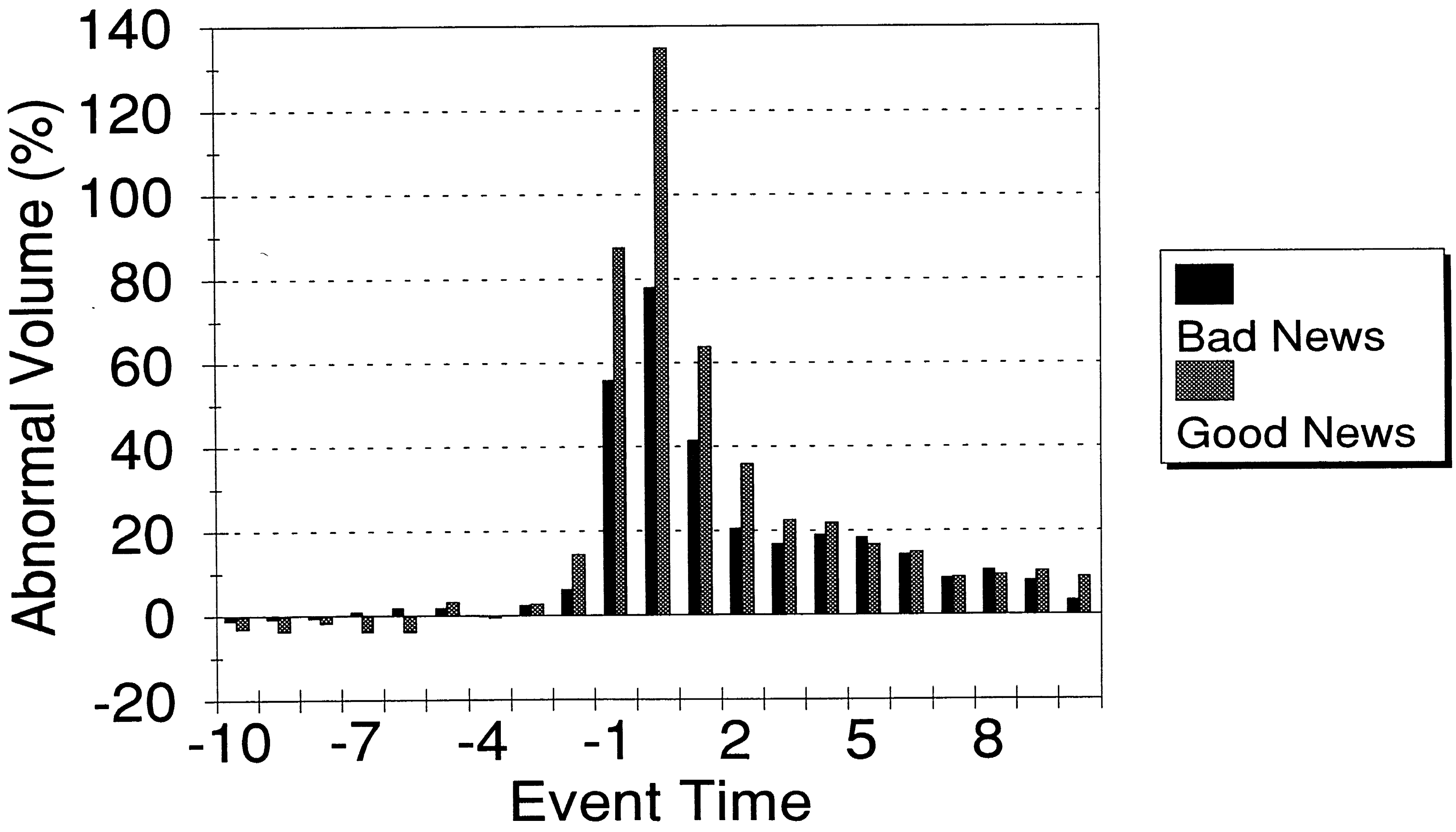

TABLE 1

Average percentage bid-ask spreads for the 41 trading days centered on 12,914 earnings announcement dates for 695 NASDAQ National Market System stocks over the January 1983 through December 1989 period.

Event Period	All Obs.	Quintile 1 (Small Firms)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (Large Firms)
Obs.	12,914	2,109	2,559	2,703	2,678	2,865
Median Market Capitalization ($ millions)	79.002	12.650	31.919	68.998	161.118	459.752
Average Percentage Spreads:						
Days -20...-11	3.25	7.14	4.27	2.84	1.85	1.15
Days -10...-2	3.23	7.12	4.23	2.82	1.85	1.15
Days -1, 0, +1	3.25	7.16	4.31	2.84	1.86	1.14
Days +2...+10	3.22	7.11	4.21	2.80	1.84	1.14
Days +11...+21	3.21	7.04	4.22	2.81	1.84	1.14
Announcement Period:						
Increase	0.02*	0.04	0.08**	0.02	0.01	-0.01*
Decrease	-0.03**	-0.05	-0.10**	-0.04*	-0.02	0.00
Overall Change	-0.04**	-0.10	-0.05	-0.03	-0.01	-0.01*

*Mean change is significantly different from zero at the five percent level, two-tailed test.
**Mean change is significantly different from zero at the one percent level, two-tailed test.

The table reports average percentage bid-ask spreads, ie., (ask price - bid price)/day -21 bid-ask midpoint, for various event periods relative to the Compustat earnings announcement date. To be included, a firm-announcement observation must have non-missing spread data for all 41 event days.

Increase and Decrease denote, respectively, the difference between the average spread during the earnings announcement period and the average spread just beforehand (days -10...-2) [ie., calculated so that a positive value indicates the Increase in spreads at the time of earnings announcements], and the difference between the average spread during the period just after earnings announcements (days +2...+10) and the average spread during the earnings announcement period [ie., calculated so that a negative value indicates the Decrease in spreads that occurs just after earnings announcements].

Overall change represents the difference between the average spread during the period before earnings announcements (days -20...-11) and the average spread during the period after earnings announcements (days +11...+21).

TABLE 2

Summary Statistics from Estimating 2,784 Time-Series Regressions of a Standardized Bid-Ask Spread Measure on Contemporaneous and Lagged Standardized Trading Volume Measures and an Earnings Announcement Period Indicator Variable. Each Regression is Estimated Using 41 Trading Days of Data, from 20 days before each Earnings Announcement through 20 days after each Earnings Announcement.*

$Spd_t = \alpha_0 + \alpha_1.Indicator_t + \beta_1.Vol_t + \beta_2.Vol_{t-1} + \varepsilon_t$

	a1	b1	b2
$Spd_t = \alpha_0 + \beta_1.Vol_t + \beta_2.Vol_{t-1} + \varepsilon_t$			
Average	NA	-0.013	-0.004
Minimum	NA	-0.339	-0.471
Maximum	NA	0.368	0.303
t-statistic	NA	-10.43	-3.19
$Spd_t = \alpha_0 + \alpha_1.Indicator_t + \beta_1.Vol_t + \varepsilon_t$			
Average	0.012	-0.013	NA
Minimum	-0.629	-0.301	NA
Maximum	1.810	.274	NA
t-statistic	2.70	-10.97	NA
$Spd_t = \alpha_0 + \alpha_1.Indicator_t + \beta_1.Vol_t + \beta_2.Vol_{t-1} + \varepsilon_t$			
Average	0.014	-0.012	-0.004
Minimum	-0.650	-0.336	-0.495
Maximum	1.810	0.370	0.303
t-statistic	2.95	-10.05	-3.13

*These 2,784 earnings announcements comprise a randomly chosen subset of the full sample of earnings announcements used in the paper. These are ordinary least squares regressions. I have also estimated these regressions using time-series techniques assuming the residuals follow a fourth order autoregressive process (using the SAS AUTOREG procedure), with almost no difference in either the parameter estimates or in their statistical significance.

The dependent variable (Spd_t) is defined as the ratio of the bid-ask spread on day t to the average bid-ask spread calculated over days -20 through +20 (after excluding days -1, 0, +1), minus one. The volume measures (Vol_t, Vol_{t-1}) are defined as the natural logarithm of the ratio of trading volume on day t to median trading volume calculated over days -20 through +20 (after excluding days -1, 0, +1). The indicator variable takes a value of one for days -1, 0, +1, and zero otherwise.

TABLE 3

Average percentage bid-ask spreads for the 41 trading days centered on 12,914 earnings announcement dates for 695 NASDAQ National Market System stocks over the January 1983 through December 1989 period: Observations are partitioned into earnings surprise deciles based on the stock price reaction to the release.

	Earnings Surprise Deciles									
	1	2	3	4	5	6	7	8	9	10
Average Percentage Spreads:										
Days -20...-11	3.95	3.46	3.13	2.88	3.47	3.46	2.85	2.70	2.93	3.63
Days -10...-2	3.87	3.46	3.12	2.84	3.43	3.44	2.81	2.73	2.97	3.65
Days -1,0,+1	4.09	3.55	3.11	2.82	3.32	3.38	2.76	2.71	2.99	3.81
Days +2...+10	3.86	3.44	3.07	2.83	3.37	3.40	2.79	2.72	2.94	3.74
Days +11...+21	3.85	3.33	3.09	2.85	3.45	3.40	2.82	2.71	2.92	3.70
Announcement Period:										
Increase	0.22**	0.09*	-0.01	-0.02	-0.11**	-0.06	-0.05	-0.02	0.02	0.16**
Decrease	-0.23**	-0.10**	-0.04	0.01	0.05	0.02	0.03	0.01	-0.05	-0.07
Overall Change:	-0.10*	-0.13**	-0.04	-0.03	-0.02	-0.06	-0.03	0.01	-0.01	0.07
Median Market Capitalization ($ millions)	54.47	72.66	79.50	94.67	77.92	83.61	101.23	96.67	87.32	59.72

*Mean change is significantly different from zero at the five percent level, two-tailed test.
**Mean change is significantly different from zero at the one percent level, two-tailed test.

The table reports average percentage bid-ask spreads, ie., [(ask price - bid price)/day -21 bid-ask midpoint], for various event periods relative to the Compustat earnings announcement date. To be included, a firm-announcement observation must have non-missing spread data for all 41 event days.

The 12,914 firm-announcement observations, ranked according to the earnings surprise, are assigned to ten groups in approximately equal numbers. Decile 1 observations convey the most negative earnings surprises while decile 10 observations convey the most positive earnings surprises. The earnings surprise is calculated as the market-adjusted stock return (computed using the average of the closing bid and ask quotations) over the announcement period (days -1 and 0).

Increase and Decrease denote, respectively, the difference between the average spread during the earnings announcement period and the average spread just beforehand (days -10...-2) [ie., calculated so that a positive value indicates the Increase in spreads at the time of earnings announcements], and the difference between the average spread during the period just after earnings announcements (days +2...+10) and the average spread during the earnings announcement period [ie., calculated so that a negative value indicates the Decrease in spreads that occurs just after earnings announcements].

Overall change represents the difference between the average spread during the period before earnings announcements (days -20...-11) and the average spread during the period after earnings announcements (days +11...+21).

TABLE 4

Median daily percentage increase (decrease) in stock-market trading volume relative to non-announcement period trading volume (with Z-statistics in parentheses) for the 21 trading days centered on 7,031 earnings announcement dates for NASDAQ National Market System stocks over the January 1983 through December 1989 period: Observations are partitioned into two groups according to whether they convey good or bad earnings news.

Day	Bad News		Good News		Z-statistic for Difference*
Obs.	3,752		3,279		
-10	-1.17	(-0.75)	-2.95	(-1.75)	-0.07
-9	-0.70	(-0.44)	-3.64	(-1.42)	0.67
-8	-0.58	(-0.25)	-1.77	(-1.05)	0.75
-7	0.88	(0.49)	-3.75	(-1.63)	0.99
-6	1.93	(0.96)	-3.68	(-1.99)	1.92
-5	1.84	(0.95)	3.22	(1.12)	0.18
-4	-0.12	(-0.13)	-0.53	(-0.28)	0.21
-3	2.54	(1.17)	2.62	(0.93)	-0.23
-2	6.16	(3.11)	14.32	(5.38)	-2.29
-1	55.73	(20.15)	87.36	(27.53)	-7.89
0	77.95	(28.47)	134.77	(36.37)	-10.65
1	41.42	(16.72)	63.84	(23.20)	-6.47
2	20.45	(9.06)	35.89	(14.80)	-5.35
3	16.84	(7.89)	22.57	(8.25)	-2.19
4	18.90	(8.17)	21.98	(8.09)	-1.04
5	18.32	(7.72)	16.70	(6.60)	-0.63
6	14.29	(6.26)	14.91	(6.13)	-1.49
7	8.66	(3.84)	8.90	(3.97)	-1.08
8	10.63	(4.58)	9.48	(3.74)	0.28
9	8.00	(3.69)	10.37	(4.41)	-0.78
10	3.30	(1.75)	8.85	(4.16)	-1.79

The table reports median percentage increases (decreases) in announcement-period trading volume. A firm-announcement is classified as conveying bad news if the accompanying announcement-period abnormal return is -2% or less and as good news if the accompanying announcement-period abnormal return is +2% or more.

For each firm-announcement on each event day, I subtract median daily non-announcement period trading volume from actual daily trading volume. I then calculate the median of these numbers across all firm-announcements on that event day. Median abnormal volume is then deflated by median non-announcement volume to yield a percentage increase (decrease). The non-announcement period comprises days -50 through -11 and +11 through +50 defined relative to the Compustat earnings announcement date. I report (in parentheses) Z-statistics from a large-sample approximation to the Fisher sign-test. This test examines the null hypothesis that the number of observations for which trading volume on a given event day exceeds the non-announcement period median is the same as the number of observations for which trading volume is less than the non-announcement period median (ties are excluded).

*The Z-statistic in the right-hand column is from a Wilcoxon rank sums test of the null hypothesis that median abnormal trading volume for the sample of bad news announcements equals median abnormal trading volume for the sample of good news announcements on a particular trading day.

TABLE 5

Average percentage bid-ask spreads for the 41 trading days centered on 11,316 earnings announcement dates for 693 NASDAQ National Market System stocks over the January 1983 through December 1989 period: Observations are first partitioned into three groups according to whether the earnings announcement conveys "bad," "intermediate," or "good" news, and then into three subcategories according to whether the announcement is "early," "on time (OT)," or "late."

	Bad News			Intermediate News			Good News		
	Early	OT	Late	Early	OT	Late	Early	OT	Late
Obs.	327	2,280	427	603	4,496	520	401	2,027	235
Average Percentage Spreads:									
Days -20...-11	3.86	3.29	4.68	3.89	2.79	4.25	4.21	2.80	4.65
Days -10...-2	3.91	3.25	4.66	3.82	2.77	4.27	4.25	2.82	4.77
Days -1,0,+1	4.04	3.32	4.92	3.90	2.71	4.20	4.29	2.91	4.81
Days +2...+10	3.84	3.25	4.53	3.87	2.73	4.33	4.24	2.85	4.70
Days +11...+21	3.81	3.20	4.57	3.93	2.77	4.18	4.24	2.83	4.67
Announcement Period:									
Increase	0.13*	0.07**	0.26***	0.08	-0.06**	-0.07	0.04	0.09***	0.04
Decrease	-0.20***	-0.07***	-0.39***	-0.03	0.02	0.13*	0.00	-0.06**	-0.11
Overall Change:	-0.05	-0.09***	-0.11	0.04	-0.02	-0.07	0.03	0.03	0.02
Median Market Capitalization ($ millions)	45.21	82.93	38.77	47.37	117.45	40.51	38.22	98.11	40.43
Abnormal Trading Volume (Days -1,0,+1)	156.1	187.4	167.7	25.11	47.04	46.33	342.9	282.7	240.37

*Mean change is significantly different from zero at the ten percent level, two-tailed test.
**Mean change is significantly different from zero at the five percent level, two-tailed test.
***Mean change is significantly different from zero at the one percent level, two-tailed test.

The table reports average percentage bid-ask spreads, ie., [(ask price - bid price)/day -21 bid-ask midpoint], for various event periods relative to the Compustat earnings announcement date. To be included, a firm-announcement observation must have non-missing spread data for all 41 event days.

The 11,316 firm-announcement observations are classified into nine categories. The announcement is classified as conveying bad news if the announcement period market-adjusted stock return is less than or equal to -2%, as good news if the announcement period market-adjusted stock return is greater than or equal to +2%, and as intermediate news otherwise. In addition, I classify the announcements according to whether they are early, on time, or late relative to the date on which earnings were announced for the same quarter of the previous year. Specifically, the announcements are classified as early, late, or on time if the announcement is more than five trading days early, more than five trading days late, or somewhere in between, respectively.

Increase and Decrease denote, respectively, the difference between the average spread during the earnings announcement period and the average spread just beforehand (days -10...-2) [ie., calculated so that a positive value indicates the Increase in spreads at the time of earnings announcements], and the difference between the average spread during the period just after earnings announcements (days +2...+10) and the average spread during the earnings announcement period [ie., calculated so that a negative value indicates the Decrease in spreads that occurs just after earnings announcements].

Overall change represents the difference between the average spread during the period before earnings announcements (days -20...-11) and the average spread during the period after earnings announcements (days +11...+21).

Abnormal trading volume represents the percentage increase in trading volume during the earnings announcement period relative to that in the non-announcement period. Thus, for the sample of early, bad news releases trading volume is 156% above normal levels during days -1, 0, and +1. See the notes to table 4 for more details.

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