Sell on the News: Differences of Opinion and Returns around Earnings Announcements

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Abstract

We present strong evidence that high differences of opinion stocks earn lower returns around earnings announcements. The evidence is similar across six different proxies for differences of opinion (earnings volatility, return volatility, dispersion of analysts' earnings forecasts, number of analysts, firm age, and share turnover). The three-day hedge returns (returns on low minus high differences of opinion stocks) around earnings announcements are equivalent to annualized returns of 14% to 60% depending upon the proxy used. The results are even stronger for firms that are more difficult to short. Our findings are consistent with Miller's (1977) hypothesis that stock prices contain an optimistic bias and that resolution of uncertainty results in downward price corrections. Our conclusions are not affected when we control for size, book-to-market, post-earnings-announcement-drift, leverage, price momentum and price reversals. Our conclusions are also not affected when we control for the return premium around earnings announcements.

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Miller (1977) hypothesizes that stock prices reflect an optimistic bias so long as there are differences of opinion among investors about stock value, and pessimistic investors do not take adequate short positions due to institutional restrictions or other behavioral reasons. With periodic announcements that may resolve uncertainty, optimistic investors, on average, are disappointed and stock valuations become more reasonable as these investors “sell on the news”. One testable implication of this model is that around events that resolve uncertainty about stock value, returns, on average, would be lower for stocks with high differences of opinion than for stocks with low differences of opinion.

Several empirical papers in the literature have attempted to test the Miller hypothesis directly, or their empirical analysis can be viewed as indirect tests of the Miller hypothesis. Diether, Malloy and Scherbina (2002, henceforth DMS) is probably the most important paper in this line of research. They use standard deviation (dispersion) of analysts’ earnings forecasts as a proxy for differences of opinion and form stock portfolios based on this proxy. They find that portfolios of stocks in the highest quintile of dispersion of analysts’ earnings forecasts underperform portfolios of stocks in the lowest quintile by 0.79% (9.48% annualized) during the month following the portfolio formation month. DMS conclude that this evidence supports the Miller hypothesis. Lee and Swaminathan (2000) and Ang, Hodrick, Xing, and Zhang (2006) report results that are also consistent with the Miller hypothesis, even though they do not set out to test the Miller hypothesis directly. They find that two other variables (share turnover and idiosyncratic stock return volatility) that can be viewed as proxies for differences of opinion are also associated with future monthly stock returns.

This evidence is important as it challenges the traditional equilibrium capital asset pricing models which usually conclude that firm-specific volatility and other similar variables are not important (e.g., Sharpe-Lintner and other models). Some models even predict results that are opposite to the above mentioned evidence (e.g., Easley and O'Hara (2004)). However, the link between the above mentioned evidence and the Miller hypothesis is not without controversy. Two recent papers present alternative explanations for the DMS evidence. Johnson (2004) argues that the DMS results are due to a leverage effect and not due to differences of opinion. Chen and Jiambalvo (2006) conclude that the DMS results are subsumed by the post-earnings-announcement-drift (e.g., see Bernard and Thomas (1989, 1990)). Similarly, Datar, Naik, and Radcliffe (1998) argue that the high return of low turnover stocks represents a liquidity premium, while Bali and Cakici (2007) indicate that there is no robust, significant relation between idiosyncratic volatility and expected returns. In research designs that rely on monthly returns, this controversy is difficult to resolve because many firm-specific variables are correlated and the power of the tests is low. It is also difficult to measure expected monthly returns.

Our main contribution in this paper is to focus on periods of resolution of uncertainty to resolve the above-mentioned controversy or at least to provide less controversial results. The DMS (2002) analysis depends on the implicit assumption that resolution of uncertainty occurs during months following the portfolio formation month. We believe that narrowing the time frame of uncertainty resolution would provide for a more powerful test of the Miller hypotheses if such events can be identified *ex-ante*. Earnings announcements, as we argue below, are just such events. Hence, we compare the earnings announcement period returns of high and low differences of opinion stocks. If the Miller hypothesis is true, we expect the results around earnings announcements to be even stronger than those in the prior research of DMS and others. In addition, focusing on specific dates when uncertainty is resolved allows us to better distinguish between the Miller hypothesis and several plausible alternative explanations. At the same time, our focus on short window returns mitigates the concern that the results may be explained by differences in systematic risk. Over short windows (three days), the effects from errors in the measurement of risk premia should be small.[1]

One important assumption in the Miller model is that pessimistic investors are kept out or stay out of the market because of short-sale constraints. In the absence of short-sale constraints, all relevant information (both good and bad) would be reflected in the stock price and differences of opinion would not matter for earnings announcement period returns. Using this argument we provide additional evidence on the Miller hypothesis. We examine whether the predictive power of differences of opinion for announcement period returns is stronger for the subsample of firms that are more difficult to short. We use institutional ownership as a proxy for short-sale constraints. Because institutional investors such as mutual funds and asset managers do most of the lending of shares, stocks with low institutional ownership are particularly difficult to short (e.g. Asquith, Pathak, and Ritter (2005), Nagel (2005)). Hence, we examine whether high differences of opinion is an even stronger predictor of announcement period returns for the subsample of firms with low institutional ownership. None of the alternative explanations predict such a relationship.

To further ensure that our results are indeed related to differences of opinion and do not reflect previously documented patterns in returns around earnings announcements, we also present a thorough analysis of the announcement period returns. First, we control for other well-known effects such as the size effect, the book-to-market effect, price momentum, and price reversals. Second, we examine Johnson (2004)'s argument that high differences of opinion stocks have low

[1] Our approach of focusing on earnings announcements is similar to that of LaPorta, Lakonishok, Shleifer and Vishny (LLSV, 1997) who examine the difference between returns on value and glamour stocks. This approach is also discussed in Chopra et al. (1992), Chan et al. (1996), and Bernard et al. (1997).

returns because of a leverage effect. Similar to Johnson, we incorporate two additional control variables that capture the leverage effect: leverage and an interaction between leverage and differences of opinion (leverage multiplied by differences of opinion). Third, we address the concerns raised by Chen and Jiambalvo (2006) that the results in DMS are subsumed by the previously known anomaly of post-earnings-announcement-drift. Beyond that, it is possible that earnings announcements themselves are associated with greater risk and return premium. Chari, Jagannathan and Ofer (1988) and Frazzini and Lamont (2006) find that excess returns around earnings announcements, on average, are positive. We control for such unknown sources of risk by using the methodology from Frazzini and Lamont (2006).

We choose earnings announcements because managers make conscious efforts to communicate relevant information to the market through this process. Beyond earnings, these announcements also provide substantial details to help the market understand the financial information just released. In most cases, firms also hold a conference call in which the CFO and/or the CEO discuss the quarterly results and take questions from financial analysts. The earnings announcements and the conference calls are among the most anticipated events through which a large amount of information is conveyed to the market. It seems reasonable to argue that this process helps resolve uncertainty not only about earnings but also about other variables.[2] Hence, these announcements are likely to reduce differences of opinion among investors.

[2] A typical earnings press release runs into several pages. In most cases, revenues, changes in capital structure, dividends, and major restructurings are also discussed along with earnings. Thus, these announcements not only reflect the resolution of uncertainty about earnings but also reflect resolution of uncertainty about other value-relevant variables. Given our research design, what is important is that some uncertainty is resolved around these events; we need not worry about the details of specific variables for which uncertainty is resolved.

Financial analysts are also known to use earnings announcements to update their forecasts in a manner consistent with resolution of uncertainty. Brown and Han (1992) and Bamber, Barron and Stober (1997) show that analysts' forecasts of future earnings are more likely to converge than diverge after the announcement of current earnings. As earnings are announced, prices adjust to a new level in a short time period of a few hours to a few days.[3] For the current quarter, the announcements essentially resolve all uncertainty about earnings. Since expected future earnings are based on current earnings, the announcement of current earnings would also reduce the uncertainty about future earnings. We are not suggesting that all differences of opinion among investors about the stock value are resolved. We are only arguing that, on average, differences of opinion are reduced.[4] As expected, there is also an increase in trading volume around these announcements just as there is an increase in trading volume around most corporate and macroeconomic announcements. The increase in trading volume may be viewed as one mechanism by which uncertainly is resolved.[5]

We use several proxies to capture differences of opinion among investors as investors are likely to form their opinion based on data from a variety of sources. DMS (2002) use standard deviation of analysts' earnings forecasts in their empirical analysis. There are at least three specific weaknesses of this proxy. First, smaller firms are usually followed by only a few analysts or not

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[3] Patell and Wolfson (1981, 1984) and Jennings and Starks (1985, 1986) discuss potential resolution of uncertainty from earnings announcements and the speed of adjustment of stock prices. Using stock options data, Patell and Wolfson (1981) find a decline in implied volatility around earnings announcements. These results are consistent with a reduction in uncertainty around earnings announcements.

[4] In discussing the resolution of uncertainty, Miller (1977) also emphasizes earnings. On page 1156, he states, "Over time the uncertainty is reduced as the company acquires a history of earnings or lack of them, and the market indicates how it will value these earnings." Similar discussions are presented in many other papers. For examples, see Bernard et al. (1997, p. 95), LaPorta et al. (1997, p.860), and DMS (2002, p. 2137).

[5] We present additional discussion of trading volume as a proxy for differences of opinion in the next section.

followed at all. When only a few analysts follow a firm, the standard deviation of forecasts is likely to be measured with substantial error. Second, financial analysts' forecasts are not always unbiased because analysts have incentives to place the firm in a better limelight.[6] Third, one assumption in using this proxy is that investors' expectations are the same as analysts' expectations. There is no strong evidence in the literature to support this assumption. To address these concerns we use several proxies for differences of opinion that do not rely on analysts' forecasts. We also use the proxy used by DMS (2002). The use of several proxies decreases the likelihood that the results are spurious or that the results are sample or proxy specific.

We consider stock market-based proxies, earnings-based proxies and analysts' forecasts-based proxies. Stock market-based proxies capture uncertainty related to all future events, earnings-based proxies reflect historical uncertainty related to earnings announcements, and analysts' forecasts-based proxies reflect the uncertainty among informed investors. The specific proxies are stock return volatility, share turnover, earnings volatility, firm age, number of analysts, and standard deviation of analysts' earnings forecasts. It is important to emphasize that we are careful to use only *ex-ante* measures of differences of opinion (prior to earnings announcements). We discuss our reasons for selecting each proxy in the next section.

Our results are consistent with the Miller hypothesis. We find that the three-day hedge returns (returns on low minus high differences of opinion stocks) are between 0.1665% and 0.7132% for the six proxies for differences of opinion. These translate into annualized returns between 14% and 60% which are substantially larger than the annualized hedge returns of 9.48% reported by DMS (2002). The returns are also larger than the annualized hedge returns of 12.72% reported by Ang et

[6] The evidence that analysts' forecasts are biased is well established. The bias is more pronounced when an analyst's employer has an investment banking relationship with the firm being followed by the analyst. See Kothari (2001, especially, pp. 153-154) for a review of this literature.

al. (2006). Consistent with Miller hypothesis, we also show that the results are even stronger for the subsample of firms that are more difficult to short (firms with low institutional ownership).

The above-mentioned results are robust with respect to several other variables. The results remain robust when we control for size, market-to-book ratio, price momentum, and price reversals. We find that our results cannot be explained by the option-like properties of levered equity as suggested by Johnson (2004). We also find that our results are not driven by the post-earnings announcement drift or the presence of a return premium around earnings announcements. Additional tests show that the results are equally strong within the sample of firms without analyst coverage; different measures of uncertainty each have incremental predictive power for announcement period returns; and price corrections continue to occur at several future earnings announcements. Overall, we provide strong evidence that is consistent with the Miller hypothesis.

This paper provides unambiguous results on the relationship between differences of opinion and stock returns. While prior papers have investigated the Miller hypothesis, none focused primarily on the resolution of uncertainty around short windows. Some evidence consistent with our findings may be gleaned from the work of Lee and Swaminathan (2000). They also report that high volume (share turnover) stocks earn lower returns around earnings announcements. However, their focus is on the interaction between momentum and volume and hence they do not control for a variety of other potential explanations. The Miller hypothesis represents a challenge to the traditional asset pricing models and hence additional research is warranted. Researchers could examine other financial markets (bonds, futures, commodities, etc.) to explore the nature and extent to which the Miller hypothesis can be generalized. Future theoretical research may also be undertaken to help us better understand the empirical results.

The rest of the paper is organized as follows. In Section 1, we discuss our proxies for differences of opinion. In Section 2, we describe our sample and discuss summary statistics. Section 3 contains our main findings on the relationship between differences of opinion and stock returns around earnings announcements. In Section 4, we examine whether alternative explanations can account for our findings. Section 5 contains the results of various additional robustness tests. In Section 6, we summarize our findings and briefly discuss their importance.

1. Proxies for Differences of Opinion (DIFOPN)

One challenge in testing the Miller hypothesis is to find satisfactory proxies that capture differences of opinion among investors about stock value *prior* to announcements that may reduce such differences of opinion. No proxy will be perfect because it is almost impossible to find reliable information (hard data) on investor opinion especially from those who trade and influence prices. Both DMS (2002) and Johnson (2004) use dispersion in analysts' earnings forecasts in their analysis. As mentioned earlier, this proxy has several weaknesses. Hence, it is important to use several proxies that reflect differences of opinion among investors.[7] We select six proxies that cover somewhat different notions of differences of opinion.

Our first proxy for differences of opinion (DIFOPN) is given by historical income volatility (INCVOL). Historical earnings are usually an important source for forecasting future earnings. If a firm's historical earnings have been more volatile, forecasting earnings for that firm would be more difficult and consequently investors would disagree more with respect to the firm's stock value. This measure is also independent of analysts' forecasts allowing us to include firms which are followed by only a few financial analysts or are not followed at all. We measure INCVOL as the

[7] We only use proxies that can be constructed from data available prior to earnings announcements. Doukas et al. (2006) use a proxy constructed with data from both before and after earnings announcements. Their results provide no support for the Miller hypothesis.

standard deviation of seasonally-differenced quarterly operating income before depreciation (Compustat Quarterly Data #22) divided by average total assets (Compustat Quarterly Data #44), measured over the twenty quarters prior to the earnings announcement quarter. We require a minimum of eight quarters of operating income data to measure INCVOL.

Our second differences of opinion proxy is given by stock return volatility (RETVOL) which is defined as the standard deviation of a firm's monthly stock returns relative to the value-weighted CRSP index for the six calendar months prior to the earnings announcement month. Note that by using stock returns relative to index returns, we control for common volatility across stocks. Stock prices play an important role in aggregating information from many sources. If most investors agreed on the value of a stock, the stock price volatility would be rather low. High RETVOL reflects frequently changing investor beliefs about the value of the firm. This proxy for differences of opinion is expected to be closely related to INCVOL as firms in more volatile businesses are likely to have high return volatility as well. However, while accounting income is backward looking, stock returns capture expectations. Thus, the first two measures are likely to complement one another. We set RETVOL to missing for firm-quarters with fewer than six monthly excess return observations.

The next two proxies (third and fourth proxies) are derived from the Institutional Brokers Estimates System (I/B/E/S). Following DMS (2002), high (low) dispersion in analysts' forecasts (DISP) reflects high (low) differences of opinion among analysts and among investors. We define DISP as the standard deviation of analysts' quarterly earnings-per-share forecasts two days prior to the earnings announcement date. We use data contained in the Detailed I/B/E/S split-adjusted file to measure analyst forecasts.[8] Forecasts are included only if they have been reviewed by I/B/E/S during the month prior to the earnings announcement date.[9] We standardize dispersion by price-per-share measured two days prior to the earnings announcement.[10] We set DISP to missing for firm-quarters with fewer than two forecasts.

Our fourth proxy is also from I/B/E/S and is defined as the number of analysts (NAL) covering the firm. Analysts collect, analyze, and disseminate information about the firms they cover. If a firm is covered by a large number of analysts, investors on average would have better information about firm value. We expect greater analyst coverage to be associated with lower differences of opinion among investors about firm value. For the regression tests in Section 3 and Section 4 we transform NAL to Ln(1/NAL). Ln(1/NAL) is more consistent with the other proxies in the sense that it is increasing in uncertainty. Taking logarithm of the raw measures is appropriate as the raw measure is skewed. We set NAL to missing if a firm does not have any valid forecasts prior to the earnings announcement.

Our fifth proxy is given by firm age (AGE), which we define as the number of years the firm has been listed on CRSP prior to the earnings announcement date. Older firms face less uncertainty because they have had longer operating history and are frequently in more mature industries. For consistency with other proxies, we transform AGE to Ln(1/AGE) in the regression tests in Sections 3 and 4.

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[8] Payne and Thomas (2003) show that the practice of rounding forecasts to the nearest penny on the Summary I/B/E/S split-adjusted file may lead to a downward bias in the standard deviation of analysts' forecasts for firms with multiple stock splits. They state that the problem is likely to be less severe for the Detailed I/B/E/S file, where data are rounded to four (rather than two) decimal points.

[9] In a few cases, the I/B/E/S review date falls before the I/B/E/S estimate date. In such cases we assume that the review date is the same as the estimate date.

[10] Our results are similar if we standardize dispersion by assets-per-share or by the absolute value of reported earnings-per-share.

Our sixth and final proxy is average daily turnover (TURN) prior to earnings announcements. Daily turnover equals number of shares traded divided by number of shares outstanding as reported on the CRSP daily tapes. TURN is defined as the average daily turnover over the six calendar months prior to the earnings announcement date. For Nasdaq-traded stocks, we divide the CRSP reported number of shares traded by two to adjust for the double counting of dealer trades.[11] We require a minimum of 100 observations to calculate TURN. Several empirical papers (see Karpoff (1987) for a survey) as well as theoretical papers (e.g., Harris and Raviv (1993)) suggest that differences of opinion among investors bring forth trading. Clearly, this is one reason but not the only reason for trading. We assume that other reasons for trading (such as portfolio rebalancing) in the pre-announcement periods do not nullify the effect from differences of opinion. Given these arguments, high (low) TURN for a stock indicates high (low) differences of opinion about stock value. We expect that stocks with high (low) TURN in periods prior to earnings announcements would earn smaller (larger) returns around earnings announcements.

It is worth emphasizing that we do not have any prediction on the behavior of the various proxies around the earnings announcements themselves. This is especially important for trading volume. Trading volume generally increases at announcements because that is one mechanism by which uncertainty is resolved quickly.[12] The TURN proxy is justified so long as we use the trading volume data from days prior to earnings announcements.

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[11] This is a crude adjustment because not all Nasdaq trades are recorded identically. As a robustness test, we verify that our results are similar when we examine NYSE and AMEX stocks separately from NASDAQ stocks.

[12] For example, trading volume is higher around earnings announcements when there is considerable uncertainty about earnings (e.g., see Bamber (1987)). In the macroeconomics literature, it is well known that trading volume increases around various announcements (e.g., see Flannery and Protopapadakis (2002)).

The six differences of opinion proxies complement each other because they capture different aspects of the uncertainty facing investors. Among the proxies used, analysts' forecast dispersion, return volatility and turnover are potentially the best short-term measures as they can be computed using recent data. An interesting feature of return volatility and turnover is that they are based on the decisions made by the market participants and hence, unlike other proxies, they are direct measures of differences of opinion among investors. On the other hand, earnings volatility is solely based on accounting data and is not affected by the perception of market participants.[13]

2. Sample

2.1. Data Sources and Variable Definitions

The sample consists of quarterly earnings announcements made by firms listed on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and NASDAQ during the period from January 1985 to December 2005. The sample starts in 1985 because there are insufficient data on analysts' quarterly earnings forecasts prior to that year. Earnings announcement dates are obtained from the Compustat Quarterly files. We exclude foreign stocks, real estate investment trusts (REITs), unit investment trusts, American trusts, financials (CRSP SIC Codes 6000 to 6999), and regulated utilities (CRSP SIC Codes 4900 to 4999). To reduce the potential effects of outliers and stale prices on the results, we exclude earnings announcements of firms with $10 million or less in total assets (measured as of the prior fiscal quarter), $10 million or less in market value of equity, and stock price of less than $1 per share as reported on CRSP two days prior to the earnings announcement date.

[13] Researchers have used variables similar to our proxies in other studies. For additional discussion of these variables, see Ang, Hodrick, Xing and Zhang (2006), Lee and Swaminathan (2000), Jiang, Lee and Zhang (2005), and Zhang (2006).

We define earnings announcement period excess returns (EXRET) as the firm's buy-and-hold return over the three-day period centered at the earnings announcement date minus the corresponding buy-and-hold return on the value-weighted CRSP index. Our inferences are similar if we use cumulative daily excess returns instead of excess buy-and-hold returns. We exclude announcements of firms with missing returns on CRSP for any one of the three announcement days. We use institutional ownership as a proxy for short-sale constraints because institutional investors do most of the lending of shares. We classify stocks with low institutional ownership as having more binding short-sale constraints. Institutional ownership (INSOWN) is measured as the total fraction of the company's shares held by institutional investors prior to the earnings announcement as reported on the Thomson Financial's CDA/Spectrum Institutional (13f) Holdings. We set INSOWN to missing if no ownership data are available for a firm-quarter during the 180 days prior to the earnings announcement, or if INSOWN is greater or equal to one.

We use several variables to control for risk and other previously documented patterns in stock returns. We use market value of common stock (MV) and market-to-book (MB) ratio to control for differences in risk (Fama and French (1992), and Lakonishok, Shleifer and Vishny (1994)). MV is given by price multiplied by number of shares outstanding as reported on CRSP two days prior to the earnings announcement date. For computing the MB ratio, both the numerator and the denominator are from Compustat for consistency. It is defined as market value of common stock (Compustat Quarterly Data #14*Data #15) divided by book value of common stock (Compustat Quarterly Data #59) at the prior fiscal quarter end. We set MB ratios of less than 0.01 or greater than 100 to missing. To test the Johnson (2004) model, we measure leverage (LEV) as total debt (Compustat Quarterly Data #51 + Data #45) divided by total assets (Compustat Quarterly Data #44) at the prior fiscal quarter end. We set LEV to missing if it is less than zero or greater than one.

We also control for the effects of prior period earnings surprises, short-term price momentum, and long-term price reversals. Earnings surprises are measured as standardized unexpected earnings (SUE) which are the seasonally-adjusted quarterly earnings-per-share divided by the price-per-share measured at the start of fiscal quarter *q*. Consistent with prior research, we convert SUEs to their quarterly decile rankings (1 through 10) using the raw SUEs of all sample firms reporting earnings in the respective calendar year-quarter. To capture the effects of short-term momentum (MOM), we calculate each firm's excess buy-and-hold returns (relative to the CRSP value-weighted index) over the twelve calendar months prior to the earnings announcement date. To capture the effect of long term reversals (REV), we calculate each firm's excess buy-and-hold returns (relative to the CRSP value-weighted index) over the 36 calendar months prior to the earnings announcement date. Finally, to control for the return premium around earnings announcements, we measure the concentration of trading volume around earnings announcements (ANNVOL). ANNVOL is given by the average daily volume around the four consecutive earnings announcements preceding fiscal quarter *q* (three days around each announcement), divided by the average daily volume for the 250 trading days ending 10 days prior to the earnings announcement for fiscal quarter *q*.

Despite eliminating the smallest firms from our sample, some variables in the sample have extreme values. To ensure that our results are not driven by outliers, we winsorize INCVOL, RETVOL, DISP, and TURN at 99% level, and MOM, REV, and ANNVOL at 1% and 99% levels. Table 1 presents the definitions of the various variables used in this study in one place.

2.2. Summary Statistics

Table 2, Panel A presents summary statistics for the six DIFOPN proxies and other variables. The maximum number of observations is 319,442 firm-quarter observations with data on excess returns around earnings announcements. For four of the DIFOPN proxies (TURN, AGE, INCVOL and RETVOL), a high percentage of the observations are available (between 217,345 and 319,442). The two DIFOPN proxies that are based on analysts' forecasts (DISP and NAL) yield a noticeably smaller number of observations (134,090 and 178,618, respectively).

The average (median) market value of firms in the sample is $1,769 million ($174 million). The average buy-and-hold return in the three days around earnings announcements is positive (0.19%) but the median is close to zero (-0.04%). A positive average return is consistent with the results in prior studies. The average standard deviation of seasonally-adjusted operating income (INCVOL) is 2.25% of firm assets, while the average standard deviation of excess monthly stock returns (RETVOL) is 12.13%. The average dispersion of analysts' forecasts of earnings (DISP) is 0.22% of the stock price. The average number of analyst forecasts (NAL) for firms with at least one valid forecast is 4.6. The average firm age (AGE) of the firms in the sample is 14.3 years, while the average daily share turnover (TURN) is 0.49% of outstanding shares.

Table 2, Panel B presents the correlation coefficients among the main variables of interest. Pearson correlation coefficients are presented below the diagonal and Spearman rank correlation coefficients are presented above the diagonal. We calculate correlation coefficients within each calendar year-quarter using only firms that report earnings in that quarter. We then report the average of the 84 quarterly coefficients and their *t*-statistics. We discuss the Pearson correlation coefficients throughout the text. Spearman correlation coefficients lead to similar inferences.

All six DIFOPN proxies are negatively related to the announcement period excess returns. For example, firms with higher earnings volatility (INCVOL) have lower announcement period returns (EXRET), as indicated by the negative correlation coefficient between EXRET and INCVOL (coefficient of -0.0281, *t*-stat of -6.38). Similarly, firms with high stock return volatility (RETVOL), firms with high dispersion of analysts' forecasts (DISP), firms with low analyst coverage (as measured by high Ln(1/NAL)), young firms (as measured by high Ln(1/AGE)), and firms with high share turnover (TURN) all have lower returns. The pair-wise correlations between our six differences of opinion proxies are positive in all cases except one. Thus, these proxies do capture similar although not identical characteristics related to the firms.

3. Results

In this section, we first report earnings announcement period returns for portfolios sorted by the six different proxies of differences of opinion among investors. This analysis helps us determine the economic magnitude of the effect. We then examine the results in a regression framework that controls for the size effect and the book-to-market effect. We use the Fama-MacBeth (1973) regression methodology for this analysis. Finally, we examine the role of short-sale constraints for the relationship between differences of opinion and returns around earnings announcements.

3.1. Preliminary Test of the Miller Hypothesis

In Table 3, we report excess earnings announcement period returns for five portfolios formed using DIFOPN proxies. We first compute the average three-day excess return for each portfolio in each of the 84 quarters. The reported portfolio returns are weighted averages of this sequence of quarterly averages, where the weights correspond to the number of observations in each quarter.[14] In the final row, we report the difference (hedge returns) between the announcement period returns of high and low DIFOPN portfolios and their corresponding *p*-values.

Consistent with the predictions of Miller (1977), high DIFOPN portfolios have significantly lower excess announcement period returns than low DIFOPN portfolios. Remarkably, this pattern is

[14] The weighted-average approach is preferred because the number of observations in earlier periods is smaller than the corresponding number in later periods; a simple average of the quarterly statistics would give undue weight to year-quarters with fewer observations. The results are similar when we calculate simple average returns instead.

true for all the six DIFOPN proxies. DMS (2002) use DISP as the proxy for differences of opinion. For the same proxy but concentrating on announcement period returns, we find that stocks in the high DIFOPN portfolio earn excess announcement period returns of -0.1186%. On the other hand, stocks in the low DIFOPN portfolio earn excess announcement period returns of 0.2836%. The difference of -0.4022% (p-value < 0.001) is economically significant. Assuming 252 trading days in a year, it translates into annualized hedge returns in absolute value terms of 33.78% (0.4022*252/3). In contrast, DMS (2002) and Ang et al. (2006) report hedge returns of only 9.48% and 12.72%, respectively, annualized from monthly returns that they use. Thus, there are substantial benefits from focusing our analysis on earnings announcements. For the six different proxies, the annualized returns range from a low of 13.99% (for NAL) to a high of 59.91% (for TURN). Even for NAL which generates the lowest hedge returns, the annualized hedge returns are larger than those reported by DMS (2002) and Ang et al. (2006).

The hedge return methodology discussed above is a prevalent approach in finance as it controls for two potential effects that may otherwise distort the evidence. First, note that the average excess return for the three-day earnings announcement window is 0.19% (see Table 2) which is similar to the results in Chari et al. (1988) and is generally interpreted as the earnings announcement premium. Thus, returns to any one portfolio would be overstated (larger) by that amount but the hedge returns would not be affected. In our case, if we subtract 0.19% from each of the portfolio returns, the excess returns to high DIFOPN portfolios would be *negative* for each of the six portfolios (consistent with Miller (1977)). Second, other unknown factors may also affect returns around earnings announcements. Such effects are controlled for as we use differences in returns across portfolios. In other words, returns to high DIFOPN portfolios are benchmarked against returns to low DIFOPN portfolios. Any factors which influence returns in general are expected to be netted out in the difference of returns across the two portfolios.

3.2. Size and Market-to-Book Controls in a Regression Analysis

To control for differences in size and market-to-book ratios, we use the following model that includes Ln(MV) and Ln(MB) along with one DIFOPN proxy at a time:

$$EXRET_{i,q} = \alpha + \beta_1 * Ln(MV)_{i,q} + \beta_2 * Ln(MB)_{i,q} + \beta_3 * DIFOPN_{i,q} + \varepsilon_{i,q}, \qquad (1)$$

where *i* identifies the firm and *q* identifies the quarterly earnings announcement. We estimate each model by calendar year-quarter and report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics, where the weights correspond to the number of observations available in each calendar year-quarter.

Table 4 reports the results for Equation (1), using the six different DIFOPN proxies. The coefficient on DIFOPN is negative and significant in all six models in Table 4. Size and market-to-book do not account for the relationship between differences of opinion and announcement period returns.[15] Furthermore, the economic significance of the effect is similar to the one reported in Table 3. For example, controlling for differences in size and market-to-book, the coefficient on INCVOL is - 0.0918 (*t*-stat of -7.76). An increase in INCVOL of 6.17% (which corresponds to the difference between the INCVOL of high and low INCVOL portfolios, not tabulated) is associated with 0.57% lower returns in the three days around quarterly earnings announcements. This difference is larger than the 0.46% spread in returns between high and low INCVOL stocks reported in Table 3.

Additional analysis of the quarterly Fama-MacBeth coefficient estimates reveals that the results are not driven by a few quarters. The coefficients on DIFOPN (β_3) for all the six proxies are

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[15] Consistent with prior research, large firms and firms with high MB ratios (growth firms) have lower announcement period returns.

negative for the majority of quarters. For example, the coefficient on INCVOL is negative for 65 out of the 84 quarters in the study (77%). For all the six proxies together, the β_3 coefficient is negative in 70% of all cases. The effect of differences of opinion on earnings announcements period returns is not specific to any particular subperiod and, unlike DMS, we do not find the results to be weaker in the latter subperiods. For example, for the last one-third (one-half) of the study period, 77% (76%) of the coefficients are negative. Overall, the results provide strong support for the Miller hypothesis that differences of opinion among investors lead to an upward bias in stock prices and that this bias is partly corrected with the arrival of earnings news. In the next subsection, we examine whether high differences of opinion stocks experience even greater corrections when they are more difficult to short.

3.3. Short-sale Constraints and Returns around Earnings Announcements

Because short-sale constraints are central to the Miller model, high differences of opinion stocks with more binding short-sale constraints should exhibit relatively larger corrections around earnings announcements. The main difficulty in testing this idea is in identifying firms that have short-sale constraints in the minds of those who consider the stock to be overvalued.[16] Lacking direct data on short-sale constraints, we use institutional ownership (INSOWN) as a proxy for short-sale constraints. Low institutional ownership should make it more difficult (more costly) for investors to borrow the stock.

To examine how short-sale constraints affect our results, each calendar quarter we separate the sample into two subsamples depending on whether a firm's institutional ownership is above or

[16] Investors may face binding short-sale constraints if they are unable to borrow the shares. Alternatively, many investors avoid short selling because of the possibility of large (theoretically infinite) losses. For example, during the telecom bubble in the late 1990s, investors were reluctant to take short positions in technology stocks even when the stocks were selling at astronomical multiples (price to earnings, price to dividends or price to sales). Lamont and Stein (2004) document that during this period, short interest was relatively low.

below the medium institutional ownership for that quarter. We then re-estimate Equation (1) separately for each subsample. We report the results for the subsample of firms with low institutional ownership in Table 5, Panel A, and those for firms with high institutional ownership in Table 5, Panel B. Consistent with the Miller (1977) hypothesis, we find that the negative relationship between DIFOPN and EXRET is particularly strong within the subsample of firms that are more difficult to short (low institutional ownership). The coefficients on all six DIFOPN variables are more negative for the subsample of firms that are more difficult to short (Panel A) relative to the results for the subsample of firms that are easier to short (Panel B). For example, the absolute value of the coefficient on RETVOL in Table 5, Panel A (-0.0337, *t*-stat of -7.45) is more than four times greater than the absolute value of the coefficient on RETVOL in Table 5, Panel B (-0.0079, *t*-stat of -1.54). The results for TURN are even more extreme: within the subsample of firms with low institutional ownership, the coefficient on TURN is -1.9168 (*t*-stat of -11.26), compared to a coefficient of only -0.1416 (*t*-stat of -1.12). Furthermore, five of the six DIFOPN coefficients are statistically significant within the short-sale constrained subsample. In contrast, only two of the coefficients are significant within the short-sale unconstrained subsample.

We provide some additional evidence on the role of short-sale constraints in the Appendix. We compute the difference between the return on high and low DIFOPN stocks (based on quintile sorts) within quintiles of stocks with different level of institutional ownership. Consistent with our results in Table 5, we find that the DIFOPN hedge returns are magnified within the subsample of stocks that are the most difficult to short (low institutional ownership). On the other hand, the DIFOPN hedge returns are small and insignificant within the groups of stocks that are easier to short (high institutional ownership). We conclude that the results on short-sale constraints are also consistent with Miller's hypothesis.

Our analysis in Section 3 is related to several asset-pricing puzzles. As mentioned in the introduction, Ang et al. (2006) find that firms with high return volatility earn abysmally low monthly returns. We find that high return volatility firms also earn low returns around earnings announcements, which is consistent with the idea that investors are overly optimistic about the prospects of high return volatility stocks. These results allay the concerns of Bali and Cakici (2007) that the negative relationship between idiosyncratic volatility and returns is not robust. Our results also extend the findings in Lee and Swaminathan (2000) by showing that the effect of share turnover on earnings announcement period returns is significantly stronger for firms that are *ex-ante* more difficult to short. Our focus on short window periods also makes it less likely that the low returns of high turnover stocks reflect lower liquidity risk as suggested by Datar, Naik, and Radcliffe (1998). Finally, our finding of lower earnings announcement period returns for younger stocks is consistent with the hypothesis that the low returns following initial public offerings (e.g. Loughran and Ritter (1995)) are at least partly due to overly optimistic investor expectations for firms going public.

4. Alternative Explanations

In this section we consider whether our results can be accounted for by several firm characteristics that do not necessarily reflect differences of opinion. Section 4.1 examines whether our results are sensitive to including leverage and the interaction of leverage with DIFOPN in our specification. Section 4.2 examines whether the post-earnings-announcement-drift phenomena affects our results. Section 4.3 examines whether the results are robust to controlling for price momentum and price reversals. Finally, Section 4.4 examines whether the results reflect return premium around earnings announcements.

4.1. Control for the Effect of Leverage

In a recent paper, Johnson (2004) argues that the negative relationship between differences of opinion proxies and returns does not necessarily reflect systematic mispricing. He suggests that differences of opinion may proxy for idiosyncratic asset risk. Because levered equity is essentially an option on the assets of the firm, standard option-pricing results predict that the expected return on levered equity is decreasing in idiosyncratic asset risk. Johnson proposes a simple test of his theory: the negative relationship between differences of opinion and returns should be increasing in financial leverage. In addition, Johnson predicts that differences of opinion will not explain the returns of firms with no leverage.

We use Equation (2) given below to test whether leverage can account for our findings. The leverage effect is controlled through the two leverage variables (LEV and LEV*DIFOPN) suggested by Johnson (2004). We also control for size and market-to-book ratios by including Ln(MV) and Ln(MB). If the Miller (1977) hypothesis is true, the coefficient on the various DIFOPN proxies (i.e., β_3) should be significantly negative even after controlling for the leverage effect. Using monthly returns (without focusing on earnings announcement dates) and the dispersion in analyst forecasts as a DIFOPN proxy, Johnson (2004) finds that β_3 is not significant and hence the original DMS (2002) results are subsumed by the leverage effect. We revisit this issue by focusing on earnings announcements.[17] Equation (2) is given by,

$$\begin{aligned} EXRET_{i,q} = \alpha &+ \beta_1 * Ln(MV)_{i,q} + \beta_2 * Ln(MB)_{i,q} + \beta_3 * DIFOPN_{i,q} \\ &+ \beta_4 * LEV_{i,q} + \beta_5 * (LEV_{i,q} * DIFOPN_{i,q}) + \varepsilon_{i,q}, \end{aligned} \qquad (2)$$

[17] It is possible that both the Miller (1977) hypothesis and the Johnson (2004) model are correct. Our focus is on testing the Miller hypothesis and we do not make any conclusions with reference to the Johnson model.

where *i* identifies the firm and *q* identifies the quarterly earnings announcement. $DIFOPN_{i,q}$ proxies for differences of opinion about the value of stock *i* prior to the release of earnings announcement *q*. We estimate Equation (2) by quarter and report weighted Fama-MacBeth (1973) coefficient estimates where the weights correspond to the number of observations available in each quarter.

Table 6 provides the estimates of Equation (2) for each of the six DIFOPN proxies. In stark contrast to the results in Johnson (2004), we find that the coefficient on each of the DIFOPN proxies is significantly negative. Hence the evidence is consistent with the Miller hypothesis. Overall, Johnson's model does not account for our results of a negative relationship between differences of opinion and stock returns around earnings announcements. We attribute our findings to our focus on short windows around earnings announcements when resolution of uncertainty is more likely to occur. This focus helps us resolve the controversy between DMS (2002) and Johnson (2004).

Johnson's model suggests that there should be no relationship between dispersion and returns for firms with zero leverage. Hence, we also estimate (results not tabulated) the above regression for firms with very low leverage ($LEV \leq 0.05$). We use a 0.05 cutoff to ensure a reasonable sample size. The coefficients estimates on DIFOPN variables are similar to the corresponding estimates when the full sample is used and are statistically significant for five out of the six proxies.[18]

4.2. Control for Post-Earnings-Announcement Drift

In this subsection, we examine whether the post-earnings-announcement-drift anomaly (Bernard and Thomas (1989, 1990) and Chan et al. (1996)) affects our finding of a negative relationship between differences of opinion and excess returns around earnings announcements. Chen and Jiambalvo (2006) find that for monthly returns, the DMS (2002) results can be explained

[18] For the sample of firms with exactly zero leverage (approximately 11% of the sample), the coefficients are negative for five out of the six proxies and are still significant for three out of the six proxies.

by the post-earnings-announcement-drift. They use monthly returns and do not focus on short windows around earnings announcements. We revisit this issue using earnings announcement period returns instead of monthly returns. The new specification is given by

$$\begin{aligned} EXRET_{i,q} = \alpha &+ \beta_1{*}Ln(MV)_{i,q} + \beta_2{*}Ln(MB)_{i,q} + \beta_3{*}DIFOPN_{i,q} \\ &+ \beta_4{*}SUE_{i,q-1} + \beta_5{*}SUE_{i,q-2} + \beta_6{*}SUE_{i,q-3} + \beta_7{*}SUE_{i,q-4} + \varepsilon_{i,q}, \end{aligned} \quad (3)$$

where SUE represents a firm's standardized unexpected earnings. We include SUE lags of up to four quarters as SUE beyond four lags is unlikely to represent the post-earnings announcement-drift. Table 7 provides the results using each of the six DIFOPN proxies. The coefficient estimates and the significance levels for all the six DIFOPN proxies remain similar to the estimates of Equation (1) presented in Table 4. This shows that our earlier conclusions are not affected when we control for prior earnings surprises. The results are robust to including any of the past SUEs separately. The results are also robust to using excess earnings announcement period returns and analyst forecast errors as alternatives to past SUEs.

4.3. Control for Price Momentum and Price Reversals

Jegadeesh and Titman (1993), among others, document that recent past winners continue to outperform recent past losers over the subsequent six to twelve months. In addition, DeBondt and Thaler (1984) show that long-run winners and losers experience price reversals. We examine whether the results are robust to including measures of short-run price momentum (MOM) and long-run price reversals (REV). The new specification is given by:

$$\begin{aligned} EXRET_{i,q} = \alpha &+ \beta_1{*}Ln(MV)_{i,q} + \beta_2{*}Ln(MB)_{i,q} + \beta_3{*}DIFOPN_{i,q} \\ &+ \beta_4{*}MOM_{i,q} + \beta_5{*}REV_{i,q} + \varepsilon_{i,q}. \end{aligned} \quad (4)$$

Table 8 provides the estimates of Equation (4). We find that the coefficient estimates and significance levels for all the six DIFOPN proxies are similar to those from Equation (1) shown in Table 4. Thus, momentum and reversals in stock prices are also not a possible explanation of our results. Consistent with the results of Jegadeesh and Titman (1993) and DeBondt and Thaler (1984) we find that MOM (REV) is positively (negatively) associated with announcement period returns.

4.4. Control for Earnings Announcement Premium

In another recent paper, Frazzini and Lamont (2006) show that trading volume around earnings announcement is positively related to earnings announcement period returns. Furthermore, they show that firms with past high trading volume around earnings announcements have larger volume and larger returns around future earnings announcements. One interpretation of this evidence is that risk around earnings announcements is large and that the premium related to this risk (earnings announcement premium) is different for different firms. We control for this possible return premium in a manner similar to the methodology in Frazzini and Lamont (2006) and incorporate ANNVOL in our regression. ANNVOL measures the concentration of trading volume around the past four earnings announcement. The new specification is given by:

$$EXRET_{i,q} = \alpha + \beta_1 * Ln(MV)_{i,q} + \beta_2 * Ln(MB)_{i,q} + \beta_3 * DIFOPN_{i,q} + \beta_4 * ANNVOL_{i,q} + \varepsilon_{i,q}. \quad (5)$$

Table 9 provides the estimates for Equation (5). The results show that our conclusions are not affected as the coefficients on the DIFOPN variable are similar to those in Table 4.[19] The results are similar if we include ANNVOL along with LEV, LEV*DIFOPN, MOM, REV and past SUEs.

Overall, we conclude that our results are most consistent with the Miller hypothesis.

5. Additional Robustness Tests

In this section we discuss the results from several additional tests. Section 5.1 reports the results of tests that control for nonlinearity and outliers. Section 5.2 reports results for the subsamples of small, medium, and large firms. Section 5.3 reports the results for the subsample of

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[19] Consistent with Frazzini and Lamont (2006), we find that there is an earnings premium as the coefficients on ANNVOL is reliably positive.

firms with no analyst coverage. Section 5.4 examines whether each DIFOPN proxy predicts announcement period returns controlling for the effect of the other five proxies. Finally, Section 5.5 reports results on whether price corrections continue to occur at future quarterly earnings announcements. For brevity, the results are not tabulated and are available from the authors upon request.

5.1. Nonlinearity and Outliers

We examine alternative specifications that control for outliers and allow for a non-linear relationship between DIFOPN proxies and announcement period returns. We convert MV, MB, LEV, each DIFOPN proxy, MOM, REV, and ANNVOL to their deciles ranking and re-estimate Equation (1) through Equation (5). The coefficients on INCVOL, RETVOL, DISP, and TURN remain negative and significant for all five specifications. The coefficient on NAL is negative in all specifications, but is statistically significant only for Equation (4). The coefficient on AGE is negative and significant in all specifications except Equation (4). We find similar results if we re-estimate Equation (1) through Equation (5) using DIFOPN dummy variables that equal one if a firm is in the top 20% of the DIFOPN distribution and zero if the firm is in the bottom 80% of the DIFOPN distribution. Overall, we conclude the results are not driven by outliers and are robust to less restrictive regression models that allow for non-linearity.

5.2. Firm Size

Although we control for firm size in our regressions, we perform two additional tests to verify that we are not simply documenting a small firm effect. First, we exclude firms with market value of equity of less than $50 million and re-estimate Equation (1). All DIFOPN variables are significant at the ten percent level or lower with the exception of firm age. When we replace Ln(1/AGE) with an age dummy that equals one if firm age is less than five years, the age dummy is negative and significant with a *t*-statistic of -2.20. Therefore, our results are robust to dropping the smallest group of firms from our sample.

Next, we divide the sample into three size categories: small (bottom three NYSE size deciles), medium (middle four NYSE size deciles) and large (top three NYSE size deciles). We then re-estimate the specification shown in Equation (1) for each size group. For the small-size group, all DIFOPN variables with the exception of Ln(1/NAL) remain significant. The analyst coverage variable may not be significant within the small-size group due to the low coverage of small firms. For the medium-size group, INCVOL, DISP and Ln(1/NAL) remain significant, while for the large-size group, none of the DIFOPN coefficients are significant. Therefore, the link between DIFOPN and earnings announcement period returns is driven by small- and medium-size firms. This is not surprising because using NYSE size deciles results in relatively fewer stocks being classified as large. Thus, for the vast majority of stocks, the results are valid.

5.3. The Role of Analysts

Scherbina (2005) suggests that the low monthly returns of high DIFOPN stocks may reflect an optimistic bias in analyst forecasts that is related to institutional rather than behavioral factors. Scherbina argues that it is less costly for analysts to inflate their earnings forecasts when analyst forecast dispersion is high. In addition, because the most pessimistic analysts may choose not to issue a forecast, high disagreement among analysts would lead to more optimistically biased mean and median forecasts. If naïve investors do not discount for these institutional biases in analyst forecasts, they will be systematically disappointed by the earnings of high DIFOPN stocks.

We examine whether Scherbina's hypothesis can account for the negative relationship between DIFOPN and announcement period returns. We re-estimate Equation (1) using the subsample of firms that do not have any analyst forecasts. We use the remaining four DIFOPN proxies that do not require analyst forecast data (INCVOL, RETVOL, AGE, and TURN). We find negative and significant coefficients on all four DIFOPN proxies. This shows that our results are not driven by biased analyst forecasts. The magnitude of the coefficients is also similar to the results reported in Table 4.

5.4. Incremental Effects of DIFOPN Proxies

As shown in Table 2, Panel B, the six DIFOPN proxies are positively correlated with each other. We explore whether each measure is negatively associated with announcement period returns controlling for the effect of the other five measures. In general, we find that the six DIFOPN proxies capture different aspects of differences of opinion. For example, when we control for DISP, we find that INCVOL, RETVOL, Ln(1/NAL) and Ln(1/AGE) remain significant. When we include all six DIFOPN proxies together, the coefficients on INCVOL, DISP and Ln(1/NAL) remain negative and significant. The coefficients on RETVOL, Ln(1/AGE) and TURN are not significant. However, this result partly reflects the requirement that firms have at least two analyst forecasts to calculate DISP.

5.5. Future Quarterly Earnings Announcements

Uncertainty may not get fully resolved with a single earnings announcement. We examine whether the negative relationship between DIFOPN and announcement period returns is also evident when firms report earnings for future quarters. In particular, we re-estimate Equation (1) replacing the dependent variable with each of the four future earnings announcement period excess returns. Overall, we find that DIFOPN proxies continue to predict announcement period returns for the next four quarters. By quarter four the results weaken but remain significant for INCVOL, RETVOL, Ln(1/NAL) and TURN. The results are consistent with several behavioral models which predict that public information alters investors' overoptimistic beliefs gradually over time (e.g. Daniel et al. (1998)).

6. Conclusion

We provide evidence that stocks with higher differences of opinion among investors about stock value earn lower returns around earnings announcements. This evidence is consistent with the Miller (1977) hypothesis which predicts that events that reduce differences of opinion among investors reduce the upward bias in stock prices. We argue that earnings announcements are such events because earnings are an important input into stock valuation. We use several proxies for differences of opinion (earnings volatility, return volatility, dispersion of analysts' earnings forecasts, number of analysts, firm age, and share turnover) to ensure that the results are not proxy-specific. By focusing on narrow windows (3-days) around earnings announcements, we are able to present results that are less open to alternative interpretations.

The difference in abnormal returns around earnings announcements between stocks with high and low differences of opinion is economically meaningful: the three-day hedge returns based on the two extreme quintile portfolios are between 0.1665% (14% annualized) and 0.7132% (60% annualized), depending upon the proxy of differences of opinion. Consistent with Miller, we show that the results are even stronger for the subsample of firms that are more difficult (costly) to short. Our conclusions are not affected when we control for size, book-to-market, post-earnings-announcement-drift, leverage, price momentum, price reversals, and return premium around earnings announcements. Additional tests show that the differences of opinion are equally important for the announcement period returns of firms without analyst coverage; different measures of differences of opinion have incremental predictive power for announcement period returns; and that price corrections are also evident around several future earnings announcements.

Our results also help interpret the prior findings of low monthly returns for stocks with high differences of opinion as measured by firm age, return volatility, share turnover, and the dispersion of analysts' forecasts of earnings. Since prior research did not focus on days around resolution of uncertainty (such as earnings announcements) or control for a myriad of alternative explanations, their conclusion have been controversial and have been challenged in the literature. Our analysis also sheds additional light on low earning announcement period returns of growth stocks (high market-to-book stocks) documented by LLSV (1997) and Bernard et al. (1997). So long as growth stocks are associated with high differences of opinion among investors, they are more subject to overpricing and subsequent corrections around earnings announcements.

Our results suggest many avenues to further enhance our understanding of the Miller (1977) model. It may be fruitful to examine whether stocks with high differences of opinion have lower returns around other public signals such as dividend announcements or management announcements of earnings forecasts. The Miller model may also be tested in other markets such as the commodities market and around other announcements such as the Federal Reserve announcements on interest rates. Future theoretical research may also be undertaken to help us better understand the empirical results.

Table 1
Variable definitions

Variable	Definition
EXRET	Buy-and-hold excess returns (in %) over the three days centered at the quarterly earnings announcements date. Excess returns are defined relative to the buy-and-hold returns of the VW CRSP index.
MV	Market value of equity (price multiplied by number of shares outstanding) as reported on CRSP two days prior to the earnings announcement date.
MB	Market value of common stock (Compustat Quarterly Data #14*Compustat Quarterly Data #15) divided by book value of common stock (Compustat Quarterly Data #59), measured at the end of the prior fiscal quarter.
INCVOL	Operating income volatility (in %). The standard deviation of seasonally-differenced quarterly operating income before depreciation (Compustat Quarterly Data #22) divided by average total assets (Compustat Quarterly Data #44), measured over twenty quarters prior to the earnings announcement quarter. Minimum of eight quarterly observations per firm required.
RETVOL	The standard deviation (in %) of excess monthly stock returns (relative to the VW CRSP index) for the six calendar months prior to the earnings announcement month.
DISP	Dispersion of analyst forecasts (in %). Standard deviation of EPS forecasts on the I/B/E/S files, measured two days prior to the earnings announcement date, divided by price-per-share measured two days prior to the earnings announcement.
NAL	The number of analysts on the I/B/E/S files with valid EPS forecasts during the month ending two days prior to the earnings announcement date. NAL is set to missing for firm-quarters without analyst forecasts.
AGE	Number of years the firm has been listed on CRSP prior to the earnings announcement date.
TURN	Average daily turnover (in %), measured over the six calendar months prior to the earnings announcement month. Daily turnover equals number of shares traded divided by number of shares outstanding, as reported on the CRSP daily tapes. For Nasdaq-traded stocks, the reported number of shares traded on CRSP is divided by two to adjust for the double counting of dealer trades. Minimum of 100 daily turnover observations required.

Table 1 (continued)

Variable	Definition
INSOWN	Institutional ownership (in %). Total fraction of the company's shares held by institutional investors prior to the earnings announcement as reported on the Thomson Financial's CDA/Spectrum Institutional (13f) Holdings.
LEV	Financial leverage (total debt divided by total assets) measured at the end of the prior fiscal quarter. Total debt equals long term debt (Compustat Quarterly Data #51) plus debt in current liabilities (Compustat Quarterly Data #45). Total assets equal Compustat Quarterly Data #44.
SUE	Quarterly decile of standardized unexpected earnings defined as (EPS_q – EPS_{q-4}) divided by price-per-share measured at the start of fiscal quarter q. EPS is defined as basic earnings-per-share excluding extraordinary items (Compustat Quarterly Data #19), adjusted for stock splits and stock dividends.
MOM	Price momentum (in %). Excess buy-and-hold monthly return (relative to VW CRSP index) over the twelve calendar months prior to the earnings announcement date.
REV	Price reversals (in %). Excess buy-and-hold monthly return (relative to VW CRSP index) over the 36 calendar months prior to the earnings announcement date.
ANNVOL	Concentration of trading volume around earnings announcements. Average daily volume around the four consecutive earnings announcements preceding fiscal quarter q (three days around each announcement), divided by the average daily volume for the 250 trading days ending 10 days prior to the earnings announcement for fiscal quarter q.

Table 2
Sample Characteristics

This table reports summary statistics for the sample of firm-quarter observations with data on earnings announcement dates on the Compustat Quarterly files and price data on the CRSP daily files. The sample excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Panel A reports summary statistics for the main variables in the study. Panel B reports average quarterly Pearson (below diagonal) and Spearman (above diagonal) correlation coefficients between these variables. We report *p*-values from a *t*-test of whether the average quarterly correlation coefficients are different from zero. Variable definitions are presented in Table 1

Panel A: Summary Statistics

Variable	# Obs.	Mean	Min	Q1	Median	Q3	Max
EXRET (in %)	319,442	0.19%	-87.85	-3.33	-0.04	3.45	277.71
MV (in Mil. $)	319,442	$1,769	10	54	174	701	579,242
MB	309,588	2.93	0.03	1.22	1.86	3.12	99.93
INCVOL (in %)	217,345	2.25%	0.00	0.64	1.36	2.74	16.29
RETVOL (in %)	312,385	12.13%	0.29	6.47	9.89	15.21	47.70
DISP (in %)	134,090	0.22%	0.00	0.03	0.08	0.20	2.96
NAL	178,618	4.6	1	2	3	6	44
AGE	319,442	14.3	0.01	3.9	9.5	19.7	80.0
TURN (in %)	315,340	0.32%	0.0003	0.10	0.21	0.41	1.80
LEV	314,875	0.22	0.00	0.04	0.18	0.34	0.999
MOM (in %)	281,852	5.80%	-88.68	-29.58	-3.54	26.00	284.58
REV (in %)	241,960	17.22%	-162.99	-59.86	-9.04	55.48	659.16
ANNVOL	282,864	1.41	0.30	0.96	1.28	1.71	4.11
INSOWN (in %)	303,414	36.77%	0.00	15.52	33.32	55.70	99.99

Table 2 (continued)

Panel B: Correlation Coefficients

	EXRET	Ln(MV)	Ln(MB)	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
EXRET	1	0.0245	-0.0054	-0.0402	-0.0416	-0.0302	-0.0179	-0.0132	-0.0197
		(8.02)	(-1.43)	(-8.54)	(-10.28)	(-6.63)	(-4.51)	(-3.97)	(-4.78)
Ln(MV)[a]	-0.0050	1	0.3325	-0.3586	-0.3220	-0.2221	-0.6786	-0.3070	0.3906
	(-1.70)		(28.33)	(-26.33)	(-23.86)	(-26.58)	(-160.08)	(-37.76)	(27.58)
Ln(MB)[a]	-0.0163	0.3033	1	0.1487	0.0898	-0.3767	-0.1541	0.1370	0.2749
	(-4.34)	(26.12)		(19.25)	(7.81)	(-42.92)	(-16.32)	(14.77)	(23.23)
INCVOL	-0.0281	-0.2790	0.2218	1	0.4717	0.2164	0.1322	0.2277	0.1746
	(-6.38)	(-35.10)	(31.53)		(75.08)	(27.79)	(14.43)	(23.70)	(14.78)
RETVOL	-0.0223	-0.3088	0.0844	0.3817	1	0.1745	0.1807	0.3263	0.2715
	(-5.34)	(-28.24)	(6.85)	(90.03)		(21.63)	(19.50)	(53.58)	(23.97)
DISP	-0.0248	-0.2549	-0.2503	0.1726	0.2319	1	-0.0137	-0.0123	0.0824
	(-3.67)	(-42.96)	(-25.07)	(23.09)	(29.84)		(-3.24)	(-1.46)	(9.08)
Ln(1/NAL)[a]	-0.0098	-0.6885	-0.1464	0.1427	0.1772	0.0646	1	0.2706	-0.3611
	(-2.23)	(-156.54)	(-15.83)	(24.03)	(21.83)	(14.36)		(38.07)	(-37.09)
Ln(1/AGE)[a]	-0.0075	-0.3193	0.1475	0.2296	0.2880	0.0470	0.2708	1	0.0083
	(-2.31)	(-39.37)	(15.82)	(49.82)	(58.76)	(6.71)	(39.08)		(0.68)
TURN	-0.0279	0.2801	0.2465	0.1561	0.2920	0.0743	-0.3001	0.0445	1
	(-7.10)	(23.99)	(23.20)	(18.04)	(27.72)	(13.37)	(-31.66)	(4.16)	

[a] MV, MB, NAL, and AGE are transformed using the log function so that their distributions are not highly skewed. NAL and AGE are further inverted so that DIFOPN proxies are interpreted similarly across all six measures (larger numerical values imply high differences of opinion while smaller numerical values imply low differences of opinion).

Table 3
Excess buy-and-hold returns around earnings announcements for differences of opinion (DIFOPN) portfolios

This table reports the excess returns for DIFOPN portfolios formed using six DIFOPN proxies. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each calendar year-quarter, firms reporting earnings in that quarter are sorted into quintile portfolios based on each of the six DIFOPN proxies. We calculate the excess returns for each portfolio in each calendar year-quarter, and then calculate and report weighted average values across the 84 quarters in our sample. The weights correspond to the number of observations available in each calendar quarter. *p*-values are from a *t*-test of whether the weighted average difference between the returns of High and Low DIFOPN firms is different from zero. Variable definitions are presented in Table 1.

	Excess Returns (in %) for Differences of Opinion (DIFOPN) Proxies					
DIFOPN Portfolio	INCVOL Low to High	RETVOL Low to High	DISP Low to High	NAL[a] High to Low	AGE High to Low	TURN Low to High
1 (Low DIFOPN)	0.3086%	0.2998%	0.2836%	0.2972%	0.2773%	0.5933%
2	0.3606	0.3135	0.3705	0.2451	0.3094	0.3052
3	0.3950	0.3499	0.4146	0.2255	0.1959	0.1635
4	0.4037	0.2041	0.2579	0.2214	0.1759	0.0001
5 (High DIFOPN)	-0.1515	-0.2286	-0.1186	0.1307	0.0024	-0.1198
High DIFOPN – Low DIFOPN	-0.4601%	-0.5284%	-0.4022%	-0.1665%	-0.2749%	-0.7132
p-value	<0.0001	<0.0001	<0.0001	0.0215	0.0032	<0.0001

[a] NAL Portfolio 1 consists of firms followed by at least nine analysts; NAL Portfolio 2 consists of firms followed by five to eight analysts; NAL Portfolios 3 consists of firms followed by three to four analysts; NAL Portfolio 4 consists of firms followed by two analysts; and NAL Portfolio 5 consists of firms followed by a single analyst.

Table 4
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, basic specification

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, controlling for the effects of market value and market-to-book ratio. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.8950	0.8355	0.5070	0.2959	0.2575	0.3825
	(9.15)	(7.88)	(2.62)	(1.39)	(2.31)	(3.92)
Ln(MV)	-0.0642	-0.0395	-0.0198	-0.0211	-0.0160	0.0221
	(-4.46)	(-2.80)	(-0.75)	(-0.56)	(-1.14)	(1.27)
Ln(MB)	-0.0842	-0.1273	-0.0509	-0.0952	-0.1646	-0.1341
	(-2.14)	(-3.14)	(-0.83)	(-1.66)	(-3.88)	(-3.31)
DIFOPN[a]	-0.0918	-0.0267	-0.5077	-0.1085	-0.0711	-0.6568
	(-7.76)	(-6.52)	(-5.12)	(-2.09)	(-2.98)	(-5.60)
Avg. Adj. R^2	0.0031	0.0030	0.0046	0.0037	0.0022	0.0031
Avg. Obs.	2,522	3,629	1,553	2,070	3,686	3,663

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Table 5
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, conditional on institutional ownership

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, conditional on institutional ownership and controlling for the effects of market value and market-to-book ratio. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each calendar quarter firms are classified as having high (low) institutional ownership depending on whether they are at or above (below) the median institutional ownership for that quarter. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1. Panel A reports the results for the subsample of firms with low institutional ownership. Panel B reports the results for the subsample of firms with high institutional ownership.

Panel A: Low Institutional Ownership (Short-sale Constrained)

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	1.5955	1.4726	0.8927	0.6454	0.7085	1.0422
	(11.01)	(9.72)	(3.49)	(2.72)	(5.11)	(8.32)
Ln(MV)	-0.2218	-0.1746	-0.1216	-0.1049	-0.1250	-0.0989
	(-8.29)	(-7.33)	(-2.94)	(-2.34)	(-5.41)	(-4.36)
Ln(MB)	-0.1969	-0.2236	-0.1134	-0.2483	-0.2808	-0.1616
	(-3.64)	(-4.66)	(-0.93)	(-3.02)	(-5.39)	(-3.36)
DIFOPN[a]	-0.1010	-0.0337	-0.5870	-0.1169	-0.0681	-1.9168
	(-6.89)	(-7.45)	(-3.73)	(-1.51)	(-2.60)	(-11.26)
Avg. Adj. R^2	0.0059	0.0049	0.0090	0.0047	0.0031	0.0065
Avg. Obs.	1,100	1,709	362	647	1,746	1,732

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Table 5 (Continued)

Panel B: High Institutional Ownership (Short-sale Unconstrained)

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.6730	0.5468	0.7036	0.5127	0.3898	0.4460
	(4.18)	(3.66)	(3.06)	(2.05)	(2.02)	(2.65)
Ln(MV)	-0.0390	-0.0241	-0.0414	-0.0364	-0.0205	-0.0121
	(-1.84)	(-1.18)	(-1.41)	(-0.88)	(-0.96)	(-0.49)
Ln(MB)	0.0485	0.0067	-0.0045	0.0110	-0.0094	0.0043
	(1.00)	(0.14)	(-0.07)	(0.18)	(-0.19)	(0.09)
DIFOPN[a]	-0.0588	-0.0079	-0.4550	-0.0414	-0.0272	-0.1416
	(-3.08)	(-1.54)	(-3.69)	(-0.77)	(-0.79)	(-1.12)
Avg. Adj. R^2	0.0032	0.0027	0.0044	0.0037	0.0029	0.0033
Avg. Obs.	1,293	1,751	1,121	1,335	1,763	1,759

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Table 6
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, controlling for the leverage effect as per Johnson (2004)

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, controlling for the effects of market value, market-to-book ratio, and financial leverage. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.9189	0.8982	0.5929	0.2942	0.2846	0.3905
	(8.56)	(8.54)	(2.87)	(1.32)	(2.23)	(3.79)
Ln(MV)	-0.0641	-0.0400	-0.0257	-0.0257	-0.0179	0.0191
	(-4.43)	(-2.86)	(-1.01)	(-0.69)	(-1.28)	(1.15)
Ln(MB)	-0.0810	-0.1238	-0.0546	-0.0972	-0.1637	-0.1350
	(-2.08)	(-3.22)	(-0.95)	(-1.82)	(-3.96)	(-3.52)
DIFOPN[a]	-0.0940	-0.0305	-0.7138	-0.1592	-0.0654	-0.5971
	(-6.18)	(-6.39)	(-5.50)	(-2.49)	(-2.08)	(-4.14)
LEV	-0.1230	-0.3339	-0.1485	0.1291	-0.0033	0.0700
	(-0.88)	(-2.16)	(-0.62)	(0.58)	(-0.01)	(0.47)
LEV*DIFOPN[a]	0.0165	0.0236	0.8102	0.1857	-0.0037	-0.3200
	(0.34)	(1.77)	(2.03)	(1.33)	(-0.05)	(-0.88)
Avg. Adj. R^2	0.0038	0.0036	0.0063	0.0044	0.0026	0.0037
Avg. Obs.	2,503	3,594	1,538	2,051	3,650	3,627

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Table 7
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, controlling for past earnings surprises

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, controlling for the effects of past earnings surprises, market value and market-to-book ratio The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.8865	0.7843	0.5908	0.3100	0.2317	0.3565
	(7.50)	(6.37)	(2.74)	(1.31)	(1.63)	(2.89)
Ln(MV)	-0.0651	-0.0391	-0.0199	-0.0361	-0.0154	0.0166
	(-4.25)	(-2.64)	(-0.78)	(-0.95)	(-1.07)	(0.93)
Ln(MB)	-0.0794	-0.1639	-0.0512	-0.1141	-0.2013	-0.1689
	(-1.98)	(-4.22)	(-0.93)	(-2.14)	(-4.93)	(-4.38)
DIFOPN[a]	-0.0980	-0.0244	-0.4255	-0.1275	-0.0682	-0.5821
	(-8.05)	(-5.12)	(-4.09)	(-2.37)	(-2.46)	(-4.81)
SUE_{q-1}	0.0742	0.0824	0.0162	0.0500	0.0801	0.0810
	(7.77)	(8.35)	(1.18)	(3.86)	(8.06)	(8.21)
SUE_{q-2}	0.0168	0.0171	0.0193	0.0176	0.0165	0.0180
	(1.92)	(2.11)	(1.59)	(1.66)	(2.04)	(2.23)
SUE_{q-3}	-0.0200	-0.0156	-0.0097	-0.0085	-0.0145	-0.0137
	(-2.48)	(-2.31)	(-0.83)	(-0.82)	(-2.13)	(-2.04)
SUE_{q-4}	-0.0650	-0.0703	-0.0380	-0.0396	-0.0689	-0.0677
	(-7.31)	(-9.26)	(-3.48)	(-3.64)	(-8.95)	(-8.89)
Avg. Adj. R^2	0.0057	0.0057	0.0062	0.0060	0.0046	0.0058
Avg. Obs.	2,272	2,847	1,285	1,671	2,849	2,848

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Table 8
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, controlling for price momentum and price reversals

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, controlling for the effect of price momentum, price reversals, market value and market-to-book ratio. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.8872	0.8738	0.5719	0.5193	0.3500	0.5139
	(8.90)	(8.08)	(2.94)	(2.53)	(2.85)	(5.26)
Ln(MV)	-0.0618	-0.0433	-0.0261	-0.0555	-0.0191	0.0097
	(-4.16)	(-3.06)	(-1.01)	(-1.59)	(-1.38)	(0.54)
Ln(MB)	-0.1058	-0.1899	-0.0633	-0.1468	-0.2209	-0.2014
	(-2.54)	(-4.74)	(-1.16)	(-2.74)	(-5.22)	(-4.98)
DIFOPN[a]	-0.0906	-0.0235	-0.4091	-0.1629	-0.0565	-0.6565
	(-7.79)	(-5.36)	(-4.26)	(-3.45)	(-1.99)	(-5.02)
MOM[b]	0.4024	0.4825	0.3983	0.4685	0.4214	0.4827
	(5.58)	(6.98)	(3.49)	(4.40)	(6.06)	(7.30)
REV[b]	-0.0959	-0.0932	-0.0644	-0.0662	-0.0874	-0.0788
	(-3.86)	(-4.46)	(-2.21)	(-2.45)	(-4.14)	(-3.81)
Avg. Adj. R^2	0.0050	0.0045	0.0080	0.0067	0.0036	0.0050
Avg. Obs.	2,426	2,957	1,266	1,659	2,957	2,957

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

[b] For ease of exposition, the coefficients on MOM and REV have been multiplied by 100.

Table 9
Differences of opinion (DIFOPN) and excess buy-and-hold returns around earnings announcements, controlling for trading volume concentration around earnings announcements

This table examines the association between differences of opinion proxies and stock returns around quarterly earnings announcements, controlling for the effect of market value, market-to-book ratio, and trading volume concentration around earnings announcements. The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each model is estimated by calendar year-quarter using all firms that reported earnings during that quarter. We report weighted Fama-MacBeth (1973) coefficient estimates and their corresponding *t*-statistics (in parenthesis), where the weights correspond to the number of observations available in each quarter. Avg. Obs. represents the average number of firm-quarter observations over the 84 quarters in the study. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
Model	INCVOL	RETVOL	DISP	Ln(1/NAL)	Ln(1/AGE)	TURN
Intercept	0.7702	0.7570	0.2829	0.1378	0.1413	0.2745
	(9.02)	(7.17)	(1.64)	(0.72)	(1.37)	(3.01)
Ln(MV)	-0.0629	-0.0406	-0.0132	-0.0161	-0.0194	0.0242
	(-4.43)	(-2.82)	(-0.53)	(-0.44)	(-1.35)	(1.40)
Ln(MB)	-0.0789	-0.1433	-0.0823	-0.1210	-0.1788	-0.1458
	(-1.97)	(-3.54)	(-1.41)	(-2.16)	(-4.29)	(-3.68)
DIFOPN[a]	-0.0969	-0.0279	-0.4730	-0.0955	-0.0960	-0.6844
	(-7.87)	(-6.44)	(-4.86)	(-1.83)	(-3.57)	(-5.64)
ANNVOL	0.0906	0.0845	0.1427	0.1187	0.0640	0.0909
	(2.55)	(2.78)	(2.59)	(2.69)	(2.07)	(2.95)
Avg. Adj. R^2	0.0034	0.0033	0.0050	0.0040	0.0023	0.0035
Avg. Obs.	2,403	3,287	1,441	1,896	3,288	3,288

[a] DIFOPN is different for each column; it is given by the differences of opinion proxy shown at the top of the respective column. Other variables are the same for each column.

Appendix
Hedge Returns (Returns on High DIFOPN – Returns on Low DIFOPN stocks), Conditional on Institutional Ownership

This table reports the difference between the returns on high DIFOPN stocks (DIFOPN Portfolio 5) and low DIFOPN stocks (DIFOPN Portfolio 1), conditional on the level of institutional ownership (INSOWN). The sample consists of firms with available earnings announcement dates on the Compustat Quarterly files and with available price data on the CRSP daily files. It excludes financials, utilities, foreign stocks, American depository receipts, real estate investment trusts, unit investment trusts, and American trusts. Each calendar year-quarter, firms reporting earnings in that quarter are sorted into quintile portfolios based on INSOWN. Within each INSOWN portfolio, we then calculate and report weighted average values of the difference between the returns on high DIFOPN stocks and low DIFOPN stocks across the 84 quarters in our sample. The weights correspond to the number of observations available in each calendar quarter. *p*-values are from a *t*-test of whether the weighted average difference between the returns of High and Low DIFOPN firms is different from zero. Variable definitions are presented in Table 1.

	Differences of Opinion (DIFOPN) Proxies					
INSOWN Portfolios	INCVOL High - Low	RETVOL High - Low	DISP High - Low	NAL[a,b] Low - High	AGE Low - High	TURN High - Low
1 (Low Inst. Ownership)	-0.9832	-0.9706	-0.8439	0.7234	-0.5822	-1.9424
	(<.0001)	(<.0001)	(0.0002)	(0.0816)	(<.0001)	(<.0001)
2	-0.6350	-0.6761	-0.1221	-0.0570	-0.4107	-1.3730
	(0.0005)	(<.0001)	(0.4983)	(0.7894)	(0.0053)	(<.0001)
3	-0.3630	-0.5702	-0.2425	0.1178	0.0209	-0.9313
	(0.0223)	(0.0000)	(0.1759)	(0.4325)	(0.8811)	(<.0001)
4	-0.1324	-0.1189	-0.2685	-0.0972	-0.2547	-0.1448
	(0.3650)	(0.4076)	(0.0699)	(0.5379)	(0.0788)	(0.3526)
5 (High Inst. Ownership)	0.0970	0.0468	-0.1055	-0.2676	-0.0295	-0.0117
	(0.4985)	(0.7591)	(0.5714)	(0.1182)	(0.7943)	(0.9325)

[a] NAL Portfolio 1 consists of firms followed by at least nine analysts; NAL Portfolio 2 consists of firms followed by five to eight analysts; NAL Portfolios 3 consists of firms followed by three to four analysts; NAL Portfolio 4 consists of firms followed by two analysts; and NAL Portfolio 5 consists of firms followed by a single analyst.

[b] Based on quarters with at least 10 firms in the Low and High NAL portfolios.

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