

The Torpedo Effect: Myth or Reality?

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General evidence indicates that managers manage earnings at three common earnings thresholds: analyst forecasts, prior period earnings, and zero earnings. We examine one market-based motivation suggested for this behavior. If managers perceive the market penalty for barely missing an earnings threshold to be disproportionately high (i.e., a torpedo effect), they may use discretion to manage earnings upward to meet the earnings threshold. This market-based incentive would explain the evidence in favor of earnings management at earnings thresholds. To test the existence of a torpedo effect, we employ a comprehensive model that measures the market's reaction to reported earnings that barely miss earnings thresholds. This model controls for the level of unexpected earnings and several other firm characteristics known to affect the relation between returns and earnings. Overall, we conclude that there is little evidence of a torpedo effect. This conclusion holds for both low-growth and high-growth firms and is unaffected by the firm's history of meeting the threshold. Our paper dispels some commonly held beliefs about the market's response to earnings thresholds.

Keywords: Earnings Management, Earnings Thresholds, Market Reaction, Torpedo Effect

1. Introduction

Conventional wisdom, arising primarily from anecdotes in the business press and asserted in some academic research, is that stock prices are disproportionately affected by earnings that barely miss earnings thresholds (i.e., a torpedo effect). Perhaps this belief originates from a speech given by Arthur Levitt, former commissioner of the Securities and Exchange Commission (SEC). He states,

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Increasingly, I have become concerned that the motivation to meet Wall Street earnings expectations may be overriding common sense business practices. Too many corporate managers, auditors, and analysts are participants in a game of nods and winks. In the zeal to satisfy consensus estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation. As a result, I fear that we are witnessing an erosion in the quality of earnings, and therefore, the quality of financial reporting. Managing may be giving way to manipulation; integrity may be losing out to illusion. . . . While the problem of earnings manipulation is not new, it has swelled in a market that is unforgiving of companies that miss their estimates. I recently read of one major U.S. company, that failed to meet its so-called numbers by one penny, and lost more than six percent of its stock value in one day. (Levitt [1998])

Academic research has not provided a thorough test of this proposition.¹ The purpose of our study is to examine the market's reaction to reported earnings that barely miss earnings thresholds. We compare this reaction to reported earnings that easily miss earnings thresholds. This comparison allows for a test of the "torpedo" effect. For completeness, we also examine the market reaction to reported earnings that barely meet and easily meet earnings thresholds.

One motivation for investigating the market's reaction to reported earnings around thresholds is that earnings management behavior could be related to market-based incentives. If managers believe the market penalty is disproportionately high for missing an earnings target, they have additional incentives to manipulate earnings to achieve these thresholds. While discretion within Generally Accepted Accounting Principles (GAAP) may allow for some manipulation of earnings, it is not likely to help firms that will easily miss earnings targets. Instead, only those firms whose true earnings will barely miss the earnings threshold are able to use discretion within GAAP to manage reported earnings to meet the threshold, and thereby avoid a potentially large market penalty. This scenario leads to the prediction that, across the distribution of reported earnings, there will be an unusually low (high) number of observations that barely miss (meet) the earnings threshold.

Academic research provides evidence consistent with this type of managerial behavioral (e.g., Burgstahler & Dichev [1997]; DeGeorge, Patel, & Zeckhauser [1999]; Payne & Robb [2000]; Bartov, Givoly, & Hayn [2002]; Beatty, Ke, & Petroni [2002]; Moehrlle [2002]; Burgstahler & Eames [2003]; Das & Zhang [2003]; Payne & Thomas [2003]; Brown & Caylor [2005]; Graham, Harvey, & Rajgopal [2005]). The evidence in these studies is consistent with managers attempting to avoid reporting a loss, avoid reporting an earnings decrease, and

1. In addition, there are certainly many anecdotes in which barely missing a threshold does *not* result in an unusually large negative market reaction. For example, for the analyst forecast (prior period earnings) [zero earnings] threshold, we find that 39.8 percent (44.7%) [41.7] of the observations that barely miss the threshold have *positive* announcement period abnormal returns. This evidence is inconsistent with a torpedo effect.

avoid missing the analyst forecast.² Burgstahler and Dichev (1997) conclude that their results provide evidence consistent with managers acting as though investors price earnings differently based on the relation to earning thresholds. DeGeorge, Patel, and Zeckhauser (1999) suggest that managers first attempt to report a profit and then to report earnings increases, and lastly they are concerned with meeting or beating analysts' forecasts. In contrast, Graham, Harvey, and Rajgopal (2005) report that managers most prefer to avoid reporting an earnings decrease, while Brown and Caylor (2005) show that achieving the analyst forecast threshold has become the most important factor over time.

If manipulation within GAAP allows firms to use discretion to manage some amount of earnings, why do *any* firms report earnings that barely miss an earnings threshold? Is this an indication that all of the firm's "reserves" within GAAP are used up, leading to a particularly bleak outlook for the firm? Does this mean that managers are not concerned with available discretion because they believe the firm lacks future prospects? Are these managers simply not able to effectively use the discretion that exists within GAAP, which could provide a strong signal of managerial incompetence to investors? Are investors simply fixated on achieving thresholds so that barely missing elicits a disproportionately strong psychological response? These are some of the notions conjectured as possible reasons for a torpedo effect. However, we contend that before attempting to understand the reasons for any torpedo effect, a necessary condition is that a torpedo effect must exist. We find no academic research providing convincing support for a torpedo effect, yet many seem to believe that it exists. The purpose of our study is to provide direct evidence of the possible existence of the torpedo effect.

We compare the market's reaction to barely missing earnings thresholds with the market's reaction to easily missing and barely meeting earnings thresholds. This differs from focusing on a comparison of simply meeting versus missing, as we are interested in the existence of a torpedo effect from *barely* missing. Instead of basing conclusions on average market reactions to announced earnings around thresholds, we employ a comprehensive model that controls for the level of unexpected earnings at the time of the earnings announcement and other firm characteristics known to affect the relation between returns and earnings.

In contrast to some beliefs that the market overreacts to announced earnings that fall just short of an earnings threshold (i.e., a torpedo effect), we find little evidence of this. For none of our thresholds do we find convincing evidence that the market reaction per dollar of unexpected earnings or market reaction uncorrelated with unexpected earnings is unusually large for the group of firms that barely miss the thresholds compared with all other groups. Although Skinner and Sloan (2002) often are cited as providing evidence of a torpedo effect, they do not

2. While most prior studies investigate managers' ability to manipulate accruals to avoid missing thresholds, recent research considers other mechanisms by which managers attempt to avoid missing thresholds, such as income classification shifting (Fan, Barua, Cready, & Thomas [2010]) and real activities management (Cohen, Dey, & Lys [2008]).

necessarily claim this result for barely missing. They show evidence of a negative market reaction to missing the analyst forecast being more pronounced for high-growth stocks. They do not, however, provide a detailed investigation of barely missing and barely meeting the analyst forecast, and they do not control for the magnitude of the earnings surprise. Furthermore, Payne and Thomas (2003) document that the results reported by Skinner and Sloan (2002) do not hold after controlling for classification errors that can arise from using Institutional Brokers Estimate System (I/B/E/S) data adjusted for stock splits/dividends. Payne and Thomas (2003) document that the differential price response for high-growth firms tends to be when firms *meet* analysts' forecasts, and not when they *miss*. We find no evidence of a torpedo effect for low-growth or high-growth firms or for firms that consistently have met the earnings threshold in recent quarters.

Although we find no evidence of a torpedo effect, managerial behavior to avoid barely missing earnings targets still may be driven by other incentives, such as managerial careers and other contractual obligations (Graham, Harvey, & Rajgopal [2005]). We document a much larger population that barely meets expectations than those that barely miss (e.g., Burgstahler & Dichev [1997]; DeGeorge, Patel, & Zeckhauser [1999]; Payne & Thomas [2003]). Therefore, earnings management behavior around earnings thresholds is likely influenced by factors other than market-based incentives. However, it could be that managers *perceive* market-based incentives to exist, but we find no basis for this belief.

Section 2 discusses the research design. Section 3 details the sample selection and presents descriptive statistics. Section 4 provides results, and Section 5 summarizes the study.

2. Research Design

Testing for the market reaction to earnings thresholds is not straightforward. For example, to test for a differential market reaction to reporting earnings that barely miss the prior period earnings threshold (i.e., reporting an earnings per share decrease of \$0.01), it is not enough to simply measure the announcement return and compare that to the announcement return of firms that report earnings that do not barely miss the prior period earnings threshold. We know this to be true based on a multitude of studies that the market's reaction to announced earnings is largely dependent on the sign and magnitude of unexpected earnings (e.g., Kothari [2001]; Nichols & Wahlen [2004]). If average unexpected earnings for the sample of firms that barely misses the threshold differs from the average unexpected earnings of other firms, then market reactions are expected to differ, but not because of any torpedo effect. For example, suppose that firms that report an earnings decrease of \$0.01 have unexpected earnings that are on average more negative than unexpected earnings reported by firms that do not report an earnings decrease of \$0.01. In this case, firms reporting an earnings decrease of \$0.01 are expected to have more negative announcement returns, but not because of a torpedo effect. The more negative market reaction of these firms is due simply to them reporting more negative unexpected earnings on average.

In addition, prior research provides evidence that differences in firm characteristics can lead to differences in the market's reaction to announced earnings. To the extent that firm characteristics differ across groups, conclusions of a torpedo effect are confounded. Therefore, to test the market's reaction to earnings thresholds, we employ a comprehensive approach that controls for both unexpected earnings and several firm characteristics. We explain these firm characteristics and their importance in more detail below.

We begin with a basic model that cumulative abnormal returns (CAR) are a function of unexpected earnings (UE).

$$CAR_{i,q} = \beta_1 * UE_{i,q} + \varepsilon_{i,q} \quad (1)$$

For our study, CAR is measured as the three-day market-adjusted return surrounding the earnings announcement (i.e., day -1 to $+1$) for firm i in quarter q . UE is defined as reported earnings less the last available individual analyst forecast, scaled by stock price at the beginning of the quarter. β_1 is the slope coefficient measuring the market reaction per dollar of UE . To test for a torpedo effect, we consider the average market reaction unrelated to UE by adding an intercept term and introducing an indicator variable (D) for reported earnings that barely miss the earnings threshold.

$$CAR_{i,q} = I_1 + I_2 * D_{i,q} + \beta_1 * UE_{i,q} + \varepsilon_{i,q} \quad (2)$$

I_2 measures the average incremental market reaction unrelated to UE for firms that barely miss the earnings thresholds. I_1 measures the average market reaction unrelated to unexpected earnings for all other firms. A torpedo effect would suggest that the average market reaction would be more negative for firms that barely miss, indicating that I_2 will be negative.

We also consider that the market's perception of earnings persistence could differ across firms, which would be revealed in differential slope coefficients. To control for this possibility, we also measure the incremental slope coefficient (β_2) to barely missing the earnings threshold. Allowing both the intercept and slope coefficients to vary gives us a more complete understanding of whether the market reaction to earnings thresholds varies.

$$CAR_{i,q} = I_1 + I_2 * D_{i,q} + \beta_1 * UE_{i,q} + \beta_2 * UE_{i,q} * D_{i,q} + \varepsilon_{i,q} \quad (3)$$

To be complete in our empirical investigation, we modify eq. (3) by classifying all sample firms into one of four mutually exclusive and collectively exhaustive groups:

Easily Miss = Firms reporting earnings that *easily miss* the earnings threshold.

Barely Miss = Firms reporting earnings that *barely miss* the earnings threshold.

Barely Meet = Firms reporting earnings that *barely meet* the earnings threshold.

Easily Meet = Firms reporting earnings that *easily meet* the earnings threshold.

The full model becomes:

$$CAR_{i,q} = \sum_{d=1}^4 (\alpha_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \varepsilon_{i,q} \quad (4)$$

eq. (4) provides a tractable way to compare intercept effects and slope effects across the four groups. In other words, these estimates allow us to determine whether the market reaction to unexpected earnings differs for firms that barely miss the earnings threshold compared with other firms.

We define barely meeting (missing) the analyst forecast threshold as reporting an earnings surprise of \$0.00 to 0.02 (\$−0.01 to \$−0.03) per share.³ We define barely meeting (missing) the prior period earnings threshold as reporting a change in earnings of \$0.00 to \$0.02 (\$−0.01 to \$−0.03) per share. We define barely meeting (missing) the zero earnings threshold as reporting earnings of \$0.00 to \$0.03 (\$−0.01 to \$−0.04) per share. The decision about which amounts to include as barely meeting and barely missing is somewhat arbitrary. Amounts are chosen so that a small portion of the sample falls into the “barely” category, while enough observations remain to provide reliable tests. As we detail below, the number of observations falling into the barely missing and barely meeting category are, respectively, as follows: analyst forecast (15.0 percent and 39.2 percent), prior period earnings (6.2 percent and 10.4 percent), and zero earnings (2.0 percent and 3.9 percent). In Table 1, we provide the distributions of reported earnings relative to each threshold for our sample of firms. As expected, the distributions for each of the three thresholds show an unusual pattern at the point of the threshold, suggesting that managers could be responding to market-based incentives to avoid missing thresholds.⁴

A final consideration is the extent to which firm characteristics differ across the four groups. Bartov, Lynn, and Ronen (2005) specifically address the importance of control variables and other research design issues when making inferences about the market’s reaction to announced earnings. We add a number of control variables to eq. (4) that potentially affect the market’s reaction to announced earnings. We control for nonlinearity in the returns/earnings relation (*LIN*), forecast dispersion (*DISP*), firm size (*SIZE*), beta (*BETA*), market-to-book ratio (*MB*), and timeliness of analysts’ forecasts (*AGE*). Each variable is defined as follows:

LIN = square root of the absolute value of *UE*.

DISP = the standard deviation of forecasts included in the most recent consensus forecast, scaled by price at the beginning of the quarter.

SIZE = the log of market capitalization the day before the three-day earnings announcement period.

3. We also have considered \$0.02 intervals (i.e., \$0.00 to \$0.01 and \$−0.01 to \$−0.02) and obtain similar results.

4. The distributions for our sample of firms are very similar to those reported in Payne and Thomas (2003).

BETA = slope from the standard market model using daily returns and the equally weighted market index over a sixty-day return interval ending the day before the three-day earnings announcement period.

MB = the ratio of market value to book value at the end of the current quarter.

AGE = the number of trading days between the last individual analyst forecast and the earnings announcement.

TABLE 1
Distribution of Reported Earnings Near Each Threshold

Earnings Interval	Analyst Forecast	Prior Period Earnings	Zero Earnings
< -0.10	5,537	14,693	7,524
-0.10	588	958	340
-0.09	713	1,023	383
-0.08	882	1,104	369
-0.07	1,009	1,239	375
-0.06	1,199	1,324	408
-0.05	1,613	1,478	443
-0.04	2,028	1,557	458
-0.03	2,682	1,726	458
-0.02	4,029	1,818	444
-0.01	6,444	1,889	359
0.00	13,570	2,634	552
0.01	12,072	3,022	976
0.02	8,817	3,491	989
0.03	5,919	3,779	925
0.04	4,261	3,945	934
0.05	3,147	3,977	1,069
0.06	2,296	3,797	1,026
0.07	1,693	3,405	987
0.08	1,471	3,048	1,017
0.09	1,118	2,605	942
0.10	969	2,468	1,163
> 0.10	<u>5,813</u>	<u>22,890</u>	<u>65,729</u>
Total	87,870	87,870	87,870

Note: The analyst forecast threshold is defined as the last individual analyst's forecast. The prior period earnings threshold is defined as earnings reported in the same quarter in the previous year. All earnings variables are those reported by Institutional Brokers' Estimate System (I/B/E/S) in per share amounts. The total sample size is 87,870 firm-quarter observations, as detailed in Table 2.

Prior research documents a nonlinearity (S-shaped relation) in the market's response to unexpected earnings (Freeman & Tse [1992]; Kinney, Burgstahler, & Martin [2002]; Bartov, Lynn, & Ronen [2005]). We control for this expected S-shaped relation by including the square root of the absolute value of unexpected earnings (*LIN*). For two of our threshold tests (i.e., zero earnings and prior period earnings) this S-shaped relation is not expected to center on the earnings threshold. For the analyst forecast threshold (which provides a direct measure of unexpected earnings), the S-shaped relation is expected to center on the threshold, consistent with prior research. We can then test whether the analyst forecast threshold elicits an incremental market reaction beyond the already expected S-shape relation documented in the literature. In other words, we can test for a kink in the S-shaped relation (i.e., an extra market penalty for barely missing the analyst forecast threshold) if a torpedo effect exists.

Simply because the S-shaped relation predicts a larger market reaction per dollar of negative unexpected earnings for firms that barely miss compared with those that easily miss, this is not necessarily evidence of a torpedo effect if one considers a more comprehensive view of the returns-earnings relation. The S-shaped relation also predicts a larger market reaction per dollar of positive unexpected earnings to barely meeting compared with easily meeting. Therefore, finding a more negative market reaction to unexpected earnings for barely missing compared with easily missing cannot alone be concluded as evidence of a torpedo effect, unless one also is willing to conclude that there is an extra market *reward* for barely meeting compared with easily meeting. This is why we provide tests that compare the market reaction of barely missing with the market reaction of barely meeting (in addition to barely missing versus easily missing).

DISP controls for measurement error in unexpected earnings. As forecast dispersion increases, any analyst's forecast is less likely to represent actual market expectations, resulting in measurement error and a downwardly biased slope coefficient. Thus, the coefficient on the interaction of *DISP* and *UE* is expected to be negative. *SIZE*, *BETA*, and *MB* control for additional variables that relate to the magnitude of the market's response to unexpected earnings (Freeman [1987]; Collins & Kothari [1989]; Easton & Zmijewski [1989]). We expect both *SIZE* and *BETA* to relate negatively to the slope coefficient, and *MB* to relate positively.⁵ *AGE* provides an additional control for measurement error in unexpected earnings. Research shows that forecast optimism increases as the forecast horizon expands (e.g., O'Brien [1988]; Brown [2001]; Richardson, Teoh, & Wysocki [2004]). The further the forecast date from the earnings announcement date, the more likely that the analyst forecast is greater than the true market expectations at the earnings announcement.⁶ Thus, the market reaction to announced earnings will be more positive (or less negative) for a given level of forecast error as the age of the forecast

5. We also used analysts' long-term earnings growth forecasts as a measure of expected growth, instead of the market-to-book ratio. Using this alternative variable had no impact on conclusions.

6. The mean (median) number of trading days between the earnings announcement and the last individual analyst forecast used to calculate unexpected earnings is 10.3 (9) for our sample.

increases. Unlike the other control variables that are interacted with unexpected earnings, we include *AGE* as a noninteracted independent variable and expect it to have a positive coefficient. Thus, our full model becomes:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} \\
 & + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \varepsilon_{i,q} \quad (5)
 \end{aligned}$$

3. Sample and Descriptive Statistics

The initial sample consists of 188,582 firm-quarter observations that have the necessary actual earnings and earnings forecast data from I/B/E/S and returns data from Center for Research in Security Prices (CRSP) for the years 1985–2006. As detailed in Table 2, the sample reduces for the following reasons: missing control variables (dispersion, market capitalization, and forecast age) from I/B/E/S (22,656), missing market-to-book ratios from *Compustat* (57,094), negative book values (1,444), firms in regulated industries (SIC code between 4400 and 5000 or between 6000 and 6500) (16,038), and firms in the top or bottom percentile of announcement period return or forecast error each year (3,480). The final sample includes 87,870 firm-quarter observations.

Announcement period returns are the three-day market-adjusted cumulative abnormal returns around the earnings announcement date (day -1 to $+1$). Unexpected earnings equal reported quarterly earnings minus the most recent individual analyst forecast before the earnings announcement. We also compare reported earnings with the most recent individual analyst forecast to determine whether the firm meets the analyst forecast threshold. The change in earnings equals current quarter earnings minus earnings of the same quarter in the previous year. All earnings variables are those reported by I/B/E/S, scaled by stock price at the beginning of the quarter. We adjust the I/B/E/S data by the split factor (Payne & Thomas [2003]).

Table 3 provides descriptive statistics. Panel A shows average amounts for the analyst forecast (prior period earnings) [zero earnings] threshold. Panel B provides distributional statistics for *CAR* and *UE*. One noticeable result in Panel A is that average market reactions differ across groups. For example, *CAR* is most negative (positive) for firms that report earnings that easily miss (easily meet) analysts' forecasts. However, this reaction makes sense when one considers how *UE* differs across groups. *UE* is most negative (positive) for firms that report large negative (positive) analyst forecast errors. These results demonstrate the difficulty of relying on simple statistics to make conclusions regarding a torpedo effect. Furthermore, firm characteristics differ across groups. Firms easily missing analysts' forecasts tend to have more extreme earnings (i.e., expected nonlinearity in the

TABLE 2
Sample Selection

	Firm-Quarter Observations
Firms with nonmissing returns data from CRSP and nonmissing actual earnings and earnings forecast data from I/B/E/S over the 1985–2006 period	188,582
Less: Firms with missing control variables from I/B/E/S (dispersion, market capitalization, and forecast age)	(22,656)
Less: Firms with missing market-to-book ratios from <i>Compustat</i>	(57,094)
Less: Firms with negative book values	(1,444)
Less: Firms in regulated industries (SIC code between 4400 and 5000 or between 6000 and 6500)	(16,038)
Less: Outliers (firms having the top or bottom percentile of announcement period return or forecast error in a year)	<u>(3,480)</u>
Final Sample	87,870

Note: CRSP = Center for Research in Security Prices; I/B/E/S = Institutional Brokers' Estimate System; SIC = Standard Industrial Classification.

returns-earnings relation), higher dispersion, lower market-to-book ratios, lower earnings levels, and more negative changes in earnings. The same conclusions can be made for the prior period earnings and zero earnings thresholds.

The distribution statistics reported in Panel B indicate similar results for *CAR* and *UE* for each threshold. Because the magnitude of *UE* is known to affect the returns-earnings relation and because it varies across groups, it represents an omitted correlated variable if not included in the model, potentially affecting inferences regarding the market's reaction to reported earnings. Therefore, we base conclusions of a torpedo effect on our multivariate model instead of simple statistics of *CAR*.

4. Results

4.1 Tests of Threshold Effects

Prior research investigates three earnings thresholds: analyst forecasts, prior period earnings, and zero earnings. Anecdotes about the torpedo effect typically focus on the analyst forecast threshold (e.g., Levitt [1998]) so we present this analysis first followed by an examination of the prior period earnings threshold (i.e., change in reported earnings) and then zero earnings threshold (i.e., the level of reported earnings).

TABLE 3

Descriptive Statistics

<i>Panel A: Mean amounts for test variables.</i>												
Threshold	N	CAR (× 100)	UE (× 100)	LIN (× 100)	DISP (× 100)	SIZE	BETA	MB	AGE	E (× 100)	ΔE (× 100)	
<i>Analyst forecast:</i>												
Easily Miss	13,569	-2.04	-0.81	7.94	0.32	20.03	1.29	2.61	10.15	0.22	-0.81	
Barely Miss	13,155	-1.42	-0.13	3.16	0.17	20.16	1.30	3.17	10.16	0.82	-0.10	
Barely Meet	34,459	0.14	0.06	1.68	0.12	20.41	1.32	3.76	10.45	1.02	0.11	
Easily Meet	26,687	2.08	0.39	5.64	0.19	20.51	1.32	3.30	10.25	1.41	0.42	
	87,870											
<i>Prior period earnings:</i>												
Easily miss	23,376	-0.94	-0.25	5.42	0.30	20.00	1.29	2.63	10.15	0.09	-1.55	
Barely miss	5,433	-0.64	-0.02	3.88	0.17	19.98	1.28	3.02	10.19	0.73	-0.18	
Barely meet	9,147	-0.33	0.02	3.21	0.13	20.08	1.28	3.22	10.33	1.07	0.08	
Easily meet	49,914	0.85	0.11	3.62	0.13	20.59	1.33	3.75	10.38	1.42	0.79	
	87,870											
<i>Zero earnings:</i>												
Easily miss	9,842	-1.09	-0.40	7.36	0.48	19.43	1.35	3.56	10.07	-2.88	-1.34	
Barely miss	1,719	-0.77	-0.09	5.50	0.30	19.49	1.33	3.16	10.19	-0.39	-0.27	
Barely meet	3,442	-0.59	-0.04	4.89	0.27	19.36	1.36	2.94	9.81	0.21	-0.24	
Easily meet	72,867	0.38	0.05	3.55	0.13	20.54	1.30	3.35	10.36	1.58	0.24	
	87,870											
<i>Panel B: Distribution statistics for cumulative abnormal returns (CAR) and unexpected earnings (UE).</i>												
Threshold	CAR (× 100)						UE (× 100)					
	Std	Min	Q1	Median	Q3	Max	Std	Min	Q1	Median	Q3	Max
<i>Analyst forecast:</i>												
Easily Miss	6.46	-31.76	-5.12	-1.51	1.31	32.77	1.05	-17.89	-0.98	-0.47	-0.24	-0.01
Barely Miss	6.46	-31.15	-4.69	-1.14	1.91	33.19	0.16	-3.05	-0.15	-0.08	-0.04	0.00

TABLE 3 (Continued)

Panel B: Distribution statistics for cumulative abnormal returns (CAR) and unexpected earnings (UE).

Threshold	CAR (× 100)					UE (× 100)						
	Std	Min	Q1	Median	Q3	Max	Std	Min	Q1	Median	Q3	Max
Barely Meet	6.81	-32.71	-3.35	0.03	3.57	33.80	0.11	0.00	0.00	0.03	0.07	3.20
Easily Meet	6.70	-32.33	-1.64	1.46	5.51	33.72	0.40	0.01	0.14	0.25	0.48	3.76
Prior period earnings:												
Easily miss	6.94	-32.71	-4.46	-0.94	2.49	33.57	0.93	-17.89	-0.37	-0.03	0.10	3.45
Barely miss	7.07	-31.76	-4.14	-0.66	2.98	33.71	0.43	-3.95	-0.13	0.00	0.11	3.15
Barely meet	6.70	-31.97	-3.70	-0.39	3.07	33.72	0.34	-3.34	-0.07	0.00	0.10	3.02
Easily meet	6.70	-32.64	-2.64	0.58	4.21	33.80	0.42	-9.40	0.00	0.05	0.19	3.76
Zero earnings:												
Easily miss	8.02	-31.81	-5.52	-1.18	2.99	33.57	1.37	-17.89	-0.73	-0.06	0.23	3.41
Barely miss	8.04	-29.36	-5.52	-1.16	3.46	32.88	0.72	-6.90	-0.33	0.00	0.20	3.45
Barely meet	8.02	-29.32	-5.11	-0.86	3.73	33.72	0.62	-4.86	-0.21	0.00	0.19	2.87
Easily meet	6.54	-32.71	-2.97	0.17	3.65	33.80	0.38	-8.76	-0.03	0.04	0.14	3.76

Note: The four groups within each threshold are mutually exclusive and collectively exhaustive. Group 1 consists of firms that easily miss the earnings threshold, Group 2 consists of firms that barely miss the earnings threshold (i.e., the “torpedo” group), Group 3 consists of firms that barely meet the earnings threshold, and Group 4 consists of firms that easily meet the threshold. Each firm-quarter observation falls into one (and only one) of the four groups for each threshold test. We define barely meeting (missing) the analyst forecast threshold as reporting an earnings surprise of \$0.00 to 0.02 (\$-0.01 to \$-0.03) per share. We define barely meeting (missing) the prior period earnings threshold as reporting a change in earnings of \$0.00 to \$0.02 (\$-0.01 to \$-0.03) per share. We define barely meeting (missing) the zero earnings threshold as reporting earnings of \$0.00 to \$0.03 (\$-0.01 to \$-0.04) per share.

Variable Definitions:

CAR equals three-day market-adjusted return surrounding the earnings announcement date (-1 to +1). UE equals quarterly unexpected earnings (i.e., actual earnings minus the last available individual analyst forecast). E equals quarterly earnings. ΔE equals the change in quarterly earnings based on the same quarter in the previous year. All earnings variables are those reported by Institutional Brokers’ Estimate System (I/B/E/S) scaled by price at the beginning of the quarter. L1N equals the square root of the absolute value of unexpected earnings; D/SP equals standard deviation of forecasts included in the most recent consensus forecast, scaled by price at the beginning of the quarter; S/IZE equals log of market capitalization the day before the three-day earnings announcement return interval, BETA equals slope from the standard market model using daily returns and the equally weighted market index over a sixty-day return interval ending the day before the three-day earnings announcement period, MB equals the market-to-book ratio at the end of the current quarter; and AGE equals the number of trading days between the last individual analyst forecast and the earnings announcement.

Table 4 reports the results of eq. (5) for the analyst forecast threshold. We show results for three versions of eq. (5). Column 1 includes intercepts, slopes, and control variables; column 2 includes intercepts and slopes but no control variables; column 3 contains only intercepts and control variables. To conclude that a threshold effect exists, we require the following. For firms that barely miss the threshold, either (1) their intercept should be more negative than the intercepts of all other groups, or (2) their slope coefficient on *UE* should be more positive than the slope coefficients of all other groups. A more negative intercept indicates a greater market penalty uncorrelated with the amount of unexpected earnings. A more positive slope coefficient indicates a greater reaction per dollar of unexpected earnings. If we cannot find evidence that the market reaction of the barely miss group is more extreme compared with *all* other groups, then we cannot conclude that this group is “special” (i.e., that a torpedo effect exists).

For the analysis with intercepts, slopes, and control variables (column 1), we find that the intercept for the barely miss group is negative (-0.007) and significant at the 0.05 level. For the easily miss group, the intercept is also negative (-0.011), significant at the 0.01 level, and significantly *more* negative than the intercept of the barely miss group at the 0.01 level. Furthermore, the slope coefficient for the barely miss group (3.340) is the lowest among all groups, suggesting that the market reaction per dollar of unexpected earnings is not unusually large. Overall, we conclude that there is no evidence of a torpedo effect associated with barely missing the analyst forecast threshold.

In column 2 of Table 4, we provide results with intercepts and slopes, but without control variables. As expected, compared with the model with control variables, slope coefficients are noticeably smaller. Furthermore, those groups closer to zero unexpected earnings (i.e., barely miss and barely meet) have larger slope coefficients compared with other groups. This is consistent with a greater linear relation between unexpected returns and unexpected earnings near zero unexpected earnings, that is, the S-shaped relation discussed earlier (Kinney, Burgstahler, & Martin [2002]). If one compares only the slope coefficients for barely missing and easily missing, then at first one might consider this evidence of a torpedo effect. However, it is important to view the results of the full model. The coefficient for barely meeting is greater than all other slope coefficients. Thus, if one considers that the “large” coefficient on barely missing is unusual (compared to easily missing) and therefore evidence of the torpedo effect, one must also conclude that the response to barely meeting is even more unusual (i.e., firms get an even greater reward for barely meeting), which is not consistent with the notion of a torpedo effect. Thus, we conclude that whether control variables are included or not, we find no consistent evidence of a torpedo effect.

In column 3 of Table 4, we provide results with intercepts only. Notice that the intercepts relate closely to the mean *CARs* in Table 3; for example, the intercept for easily missing is -0.022 in Table 4 and -0.0204 in Table 3 (after division by 100). This serves as confirmation that our interpretation of the descriptive statistics in Table 3 goes unchanged in our analyses using Fama and MacBeth (1973)

TABLE 4

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Analyst Forecast Threshold ($N = 87,870$)

<i>Panel A: Regression coefficients</i>			
	(1)	(2)	(3)
Intercepts:			
I_1 (Easily Miss)	-0.011***	-0.019***	-0.022***
I_2 (Barely Miss)	-0.007**	-0.011***	-0.013***
I_3 (Barely Meet)	0.003	0.000	0.002**
I_4 (Easily Meet)	0.016***	0.015***	0.019***
Slopes:			
β_1 (Easily Miss)	3.561***	0.384***	
β_2 (Barely Miss)	3.340***	1.287***	
β_3 (Barely Meet)	5.421***	2.826**	
β_4 (Easily Meet)	4.187***	1.077***	
Controls	Yes	No	Yes

<i>Panel B: Tests of differences in intercepts and slopes</i>			
Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_3 < 0$)			
I_2 (Barely Miss) vs. I_1 (Easily Miss)	0.004***	0.008***	0.009***
I_2 (Barely Miss) vs. I_3 (Barely Meet)	-0.010***	-0.011***	-0.014***
Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)			
β_2 (Barely Miss) vs. β_1 (Easily Miss)	-0.221	0.903**	
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-2.081	-1.538	

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the analyst forecast threshold, we define barely meeting (missing) the threshold as reporting an earnings surprise of \$0.00 to \$0.02 (\$-0.01 to \$-0.03) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} \\
 & + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \varepsilon_{i,q}
 \end{aligned}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definitions:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions.

regressions with the inclusion of control variables. Although the intercepts for both easily missing and barely missing are significantly negative, easily missing is significantly more negative, indicating a greater negative reaction to earnings that easily miss the analyst forecast threshold.

Table 5 provides results for the prior period earnings threshold. We find no evidence of a torpedo effect. For the full sample with control variables, we find that the intercepts and slope coefficients for firms that barely miss the prior period earnings threshold are not significantly different from those of firms that easily miss or barely meet the threshold. When we do not include control variables or when we exclude slope coefficients, conclusions do not change. The only significant difference we find is the intercept for easily missing is significantly more negative than is the coefficient for barely missing, inconsistent with a torpedo effect. Thus, across all of these tests, we detect no evidence that the market reaction to barely missing the prior period earnings threshold is unusual.

Table 6 provides results for the zero earnings threshold. Here, we again find no evidence of a torpedo effect. With only one exception, all differences in intercepts and slope coefficients are not significant across our tests. The one exception includes the slope coefficient for barely missing being significantly less than the slope coefficient for barely meeting in the model excluding control variables. This result is not consistent with a greater market reaction to barely missing the zero earnings threshold. In conclusion, across three thresholds, for models with and without control variables, we detect no consistent evidence of a torpedo effect.

4.2 Influence of Growth Expectations and History of Meeting Earnings Thresholds

In this section, we consider whether any torpedo effect may be isolated to certain types of firms. First, some may suggest that “glamour” stocks (i.e., those with high expected growth) are especially susceptible to investor disappointment (Lakonishok, Shleifer, & Vishny [1994]), exacerbating any torpedo effect. Therefore, in our first test, we partition the sample into low expected growth versus high expected growth based on the median market-to-book ratio at the end of the current quarter. One might expect to observe more evidence of a torpedo effect for high market-to-book firms. As shown in the first two columns of Table 7 for the analyst forecast threshold, the results for the low-growth and high-growth samples are similar to one another and neither shows consistent evidence of a torpedo effect for barely missing. The first two columns of Table 8 (Table 9) provide results of low-growth and high-growth firms for the prior period earnings (zero earnings) threshold. We observe no evidence of a torpedo effect for these thresholds.

Second, we examine whether the company’s history of meeting a threshold impacts conclusions of a torpedo effect for barely missing in the current period (Kim [2002]). Burgstahler and Dichev (1997) find that the distributions of reported earnings levels and earnings changes become more kinked just below zero as the

TABLE 5

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Prior Period Earnings Threshold ($N = 87,870$)

<i>Panel A: Regression coefficients</i>			
	(1)	(2)	(3)
<i>Intercepts:</i>			
I_1 (Easily Miss)	0.000	-0.007***	-0.010***
I_2 (Barely Miss)	0.000	-0.006***	-0.005***
I_3 (Barely Meet)	0.001	-0.004***	-0.003***
I_4 (Easily Meet)	0.009***	0.005***	0.008***
<i>Slopes:</i>			
β_1 (Easily Miss)	5.656***	1.577***	
β_2 (Barely Miss)	5.527***	2.212***	
β_3 (Barely Meet)	6.027***	2.852***	
β_4 (Easily Meet)	6.118***	2.628***	
Controls	Yes	No	Yes

<i>Panel B: Tests of differences in intercepts and slopes</i>			
<i>Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_1 < 0$)</i>			
I_2 (Barely Miss) vs. I_1 (Easily Miss)	0.000	0.001	0.005***
I_2 (Barely Miss) vs. I_3 (Barely Meet)	-0.001	-0.002	-0.002
<i>Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)</i>			
β_2 (Barely Miss) vs. β_1 (Easily Miss)	-0.129	0.635	
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-0.500	-0.640	

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the prior period earnings threshold, we define barely meeting (missing) the threshold as reporting change in earnings of \$0.00 to \$0.02 (\$-0.01 to \$-0.03) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} \\
 & + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \varepsilon_{i,q}
 \end{aligned}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definitions:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions.

TABLE 6

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Zero Earnings Threshold (N = 87,870)

Panel A: Regression coefficients

	(1)	(2)	(3)
Intercepts:			
I_1 (Easily Miss)	-0.002	-0.009***	-0.010***
I_2 (Barely Miss)	-0.003	-0.008***	-0.008***
I_3 (Barely Meet)	-0.003	-0.006***	-0.007***
I_4 (Easily Meet)	0.004	0.001	0.004***
Slopes:			
β_1 (Easily Miss)	6.444***	0.999***	
β_2 (Barely Miss)	6.389***	1.575***	
β_3 (Barely Meet)	6.885***	2.407***	
β_4 (Easily Meet)	7.785***	3.651***	
Controls	Yes	No	Yes

Panel B: Tests of differences in intercepts and slopes

Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_3 < 0$)			
I_2 (Barely Miss) vs. I_1 (Easily Miss)	-0.001	0.001	0.002
I_2 (Barely Miss) vs. I_3 (Barely Meet)	0.000	-0.002	-0.001
Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)			
β_2 (Barely Miss) vs. β_1 (Easily Miss)	-0.055	0.576	
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-0.496	-0.832**	

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the zero earnings threshold, we define barely meeting (missing) the threshold as reporting earnings of \$0.00 to \$0.03 (\$-0.01 to \$-0.04) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$CAR_{i,q} = \sum_{d=1}^4 (I_d^* D_{d,i,q} + \beta_d^* UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \epsilon_{i,q}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definitions:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions.

TABLE 7

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Analyst Forecast Threshold, Conditioned on Growth Expectations and History of Meeting

<i>Panel A: Regression coefficients</i>				
	Low Growth	High Growth	Meet Past Two Qtrs.	Meet Past Four Qtrs.
Intercepts:				
I_1 (Easily Miss)	-0.004	-0.020***	-0.022***	-0.021***
I_2 (Barely Miss)	0.002	-0.019***	-0.016**	-0.017**
I_3 (Barely Meet)	0.009	-0.008	-0.005	-0.008
I_4 (Easily Meet)	0.017***	0.008	0.009	0.005
Slopes:				
β_1 (Easily Miss)	4.129***	6.576***	3.822**	9.564**
β_2 (Barely Miss)	3.361***	7.561***	2.976**	11.358**
β_3 (Barely Meet)	5.750***	11.233***	8.760***	13.157***
β_4 (Easily Meet)	4.841***	7.018***	5.367***	10.680***
Controls	Yes	Yes	Yes	Yes
N	43,928	43,942	45,412	28,231

Panel B: Tests of Differences in Intercepts and Slopes

Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_3 < 0$)				
I_2 (Barely Miss) vs. I_1 (Easily Miss)	0.006**	0.001	0.006**	0.004
I_2 (Barely Miss) vs. I_3 (Barely Meet)	-0.008***	-0.011***	-0.011***	-0.009**
Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)				
β_2 (Barely Miss) vs. β_1 (Easily Miss)	-0.768	0.985	-0.846	1.794
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-2.389	-3.672	-5.784*	-1.799

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the analyst forecast threshold, we define barely meeting (missing) the threshold as reporting an earnings surprise of \$0.00 to \$0.02 (\$-0.01 to \$-0.03) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} \\
 & + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \varepsilon_{i,q}
 \end{aligned}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definitions:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions. The low (high) growth sample consists of observations that have a market-to-book ratio at the end of the quarter less than (greater than or equal to) the median in each year. Firms classified as meeting the threshold for two (four) quarters are those that report earnings that meet or exceed the analyst forecast for at least the prior two (four) quarters.

TABLE 8

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Prior Period Earnings Threshold, Conditioned on Growth Expectations and History of Meeting

Panel A: Regression coefficients

	Low Growth	High Growth	Meet Past Two Qtrs.	Meet Past Four Qtrs.
Intercepts:				
I_1 (Easily Miss)	0.004	-0.010	-0.006	-0.007
I_2 (Barely Miss)	0.006	-0.012**	-0.008	-0.008
I_3 (Barely Meet)	0.008	-0.011**	-0.004	-0.006
I_4 (Easily Meet)	0.015***	-0.003	0.004	0.002
Slopes:				
β_1 (Easily Miss)	5.378***	8.949***	10.711***	13.175***
β_2 (Barely Miss)	5.285***	8.803***	10.633***	13.745***
β_3 (Barely Meet)	5.935***	8.999***	10.144***	13.659***
β_4 (Easily Meet)	5.751***	9.401***	11.274***	14.048***
Controls	Yes	Yes	Yes	Yes
N	43,928	43,942	45,277	31,199

Panel B: Tests of differences in intercepts and slopes

Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_3 < 0$)				
I_2 (Barely Miss) vs. I_1 (Easily Miss)	0.001	-0.002	-0.002	-0.001
I_2 (Barely Miss) vs. I_3 (Barely Meet)	-0.002	-0.001	-0.004	-0.002
Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)				
β_2 (Barely Miss) vs. β_1 (Easily Miss)	-0.095	-0.146	-0.078	0.570
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-0.650	-0.196	0.489	0.086

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the prior period earnings threshold, we define barely meeting (missing) the threshold as reporting change in earnings of \$0.00 to \$0.02 (\$-0.01 to \$-0.03) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d^* D_{d,i,q} + \beta_d^* UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q}^* LIN_{i,q} + \beta_{11} UE_{i,q}^* DISP_{i,q} \\
 & + \beta_{12} UE_{i,q}^* SIZE_{i,q} + \beta_{13} UE_{i,q}^* BETA_{i,q} + \beta_{14} UE_{i,q}^* MB_{i,q} + \varepsilon_{i,q}
 \end{aligned}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definition:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions. The low (high) growth sample consists of observations that have a market-to-book ratio at the end of the quarter less than (greater than or equal to) the median in each year. Firms classified as meeting the threshold for two (four) quarters are those that report earnings that meet or exceed the prior period earnings threshold for at least the prior two (four) quarters.

TABLE 9

Market Reaction to Reporting Earnings That Barely Meet/Miss or Easily Meet/Miss the Zero Earnings Threshold, Conditioned on Growth Expectations and History Of Meeting

<i>Panel A: Regression coefficients</i>				
	Low Growth	High Growth	Meet Past Four Qtrs.	Meet Past Eight Qtrs.
Intercepts:				
I_1 (Easily Miss)	0.006	-0.016***	0.004	0.011
I_2 (Barely Miss)	0.011	-0.019***	-0.001	-0.015
I_3 (Barely Meet)	0.006	-0.013**	-0.011***	-0.009
I_4 (Easily Meet)	0.012**	-0.010	0.001	0.001
Slopes:				
β_1 (Easily Miss)	5.759***	11.187***	14.581***	17.458***
β_2 (Barely Miss)	6.124***	10.557***	13.819***	15.541***
β_3 (Barely Meet)	6.384***	11.607***	12.928***	15.118***
β_4 (Easily Meet)	6.862***	13.306***	14.598***	17.111***
Controls	Yes	Yes	Yes	Yes
N	43,928	43,942	65,539	50,513

Panel B: Tests of differences in intercepts and slopes

Intercept Differences ($H_a: I_2 - I_1 < 0$ and $I_2 - I_3 < 0$)				
I_2 (Barely Miss) vs. I_1 (Easily Miss)	0.005	-0.003	-0.005	-0.026
I_2 (Barely Miss) vs. I_3 (Barely Meet)	0.005	-0.006	0.010	-0.006
Slope Differences ($H_a: \beta_2 - \beta_1 > 0$ and $\beta_2 - \beta_3 > 0$)				
β_2 (Barely Miss) vs. β_1 (Easily Miss)	0.365	-0.630	-0.762	-1.917
β_2 (Barely Miss) vs. β_3 (Barely Meet)	-0.260	-1.050	0.891	0.423

Note: Each firm-quarter observation falls into one (and only one) of the four groups. For the zero earnings threshold, we define barely meeting (missing) the threshold as reporting earnings of \$0.00 to \$0.03 (\$-0.01 to \$-0.04) per share. The relation between announcement returns and unexpected earnings for each of these four groups is estimated using the following model:

$$\begin{aligned}
 CAR_{i,q} = & \sum_{d=1}^4 (I_d * D_{d,i,q} + \beta_d * UE_{d,i,q}) + \beta_5 DISP_{i,q} + \beta_6 SIZE_{i,q} + \beta_7 BETA_{i,q} \\
 & + \beta_8 MB_{i,q} + \beta_9 AGE_{i,q} + \beta_{10} UE_{i,q} * LIN_{i,q} + \beta_{11} UE_{i,q} * DISP_{i,q} \\
 & + \beta_{12} UE_{i,q} * SIZE_{i,q} + \beta_{13} UE_{i,q} * BETA_{i,q} + \beta_{14} UE_{i,q} * MB_{i,q} + \varepsilon_{i,q}
 \end{aligned}$$

***, ** denote significance at the 1 and 5 percent levels, respectively, for a two-tailed test using the Fama and Macbeth (1973) procedure. Reported amounts are averages of annual coefficients.

Variable Definitions:

$D_{d,i,q}$ equals one for firm i in quarter q in group d , zero otherwise. See Table 3 for other variable definitions and group descriptions. The low (high) growth sample consists of observations that have a market-to-book ratio at the end of the quarter less than (greater than or equal to) the median in each year. Firms classified as meeting the threshold for four (eight) quarters are those that report earnings that meet or exceed the zero earnings threshold for at least the prior four (eight) quarters.

firm's history of meeting the benchmark increases. Thus, investors may be especially disappointed if the firm misses an earnings target in the current quarter after having achieved it for the past several quarters. For the analyst forecast and prior period earnings thresholds, we examine firms that met the threshold for at least the past two quarters or at least the past four quarters. For the zero earnings threshold, we examine firms that met the threshold for at least the past four quarters or at least the past eight quarters. We are able to examine a longer history for the zero earnings threshold because of the greater number of firms that achieve this. Only about 12.9 percent (18.2%) of the sample observations achieve the analyst forecast (prior period earnings) threshold for at least eight consecutive quarters. Given that we have four groups per threshold (easily miss, barely miss, barely meet, and easily meet), the relatively small number of observations provides less reliable tests.

The results are presented in the final two columns of Tables 7, 8, and 9 for the analyst forecast, prior period earnings, and zero earnings thresholds, respectively. For firms that have consistently met the threshold, we find results similar to those reported for the full sample. For none of the thresholds do we find evidence that barely missing results in a more negative intercept or a more positive slope coefficient compared with the other groups. We conclude that for each of these groups, there is no consistent evidence of a torpedo effect.

4.3 Sensitivity Analyses

We first consider that in recent years firms more commonly disclose additional information at the time earnings are announced. Perhaps the disclosure of additional information better helps investors understand the nature of barely missing a threshold so there is less of a strong reaction when this occurs. If this is the case, then we would expect to find more evidence of a torpedo effect in the early years of our sample. To test this, we split the sample in half (1985–1995 and 1996–2006). In untabulated analyses, we find that results are consistent across the two subperiods. There is no evidence of a torpedo effect in either subperiod.

Next, we consider whether our treatment for outliers affects inferences. Recall that for our tests, we delete the extreme percentiles of *CAR* and *UE*. As a sensitivity test, we instead winsorize these variables at the extreme percentiles. Our results are not affected by this change.

As a third sensitivity test, we consider whether conclusions of a torpedo effect change when we use each earnings threshold as our measure of *UE*. For example, to test the zero earnings threshold, we use the level of reported earnings per share (scaled by price) as *UE*, and for the prior period earnings threshold, we use the change in earnings per share (scaled by price). Although we believe that the analyst forecast error provides the superior measure of *UE* for all of our earnings threshold tests, it could be that using these alternative definitions of *UE* based on the corresponding threshold makes sense if a torpedo effect exists due to investors'

behavioral biases. With these alternative measures of *UE*, we find results very similar to those reported in Tables 5, 6, 8, and 9. Specifically, we find that the intercepts and slope coefficients for firms that barely miss the threshold are not significantly different from those of firms that either easily miss or barely meet the thresholds. Therefore, we continue to conclude that a torpedo effect does not exist.

For the fourth sensitivity test, we consider whether evidence of a torpedo effect might be greater in the fourth quarter versus the first three quarters. Prior research provides the general conclusion that earnings management behavior is greater in the fourth quarter (Givoly & Ronen [1981]; Jeter & Shivakumar [1999]; Jacob & Jorgensen [2007]; Das, Shroff, & Zhang [2007]; Cohen, Mashruwala, & Zach [2008]; Fan, Barua, Cready, & Thomas [2010]). We find that results are very similar in the fourth quarter versus first three quarters, and neither sample shows evidence of a torpedo effect.

5. Conclusion

Extensive prior research provides evidence indicating that managers manage earnings at three common earnings thresholds: zero earnings, prior period earnings, and analyst forecasts. One rationale for this result is that managers face disproportionately large market penalties for barely missing an earnings threshold, prompting managerial manipulation of reported earnings that otherwise would have fallen just short of the threshold. We compare the market's reaction to barely missing earnings thresholds to the market's reaction to easily missing and barely meeting earnings thresholds. We find no consistent evidence of an extra market penalty for barely missing any of the earnings thresholds. In other words, we find no evidence of a torpedo effect.

This raises an important question. If short-term market incentives do not provide motivation for earnings management around thresholds, what incentives are present? Although managers may perceive market-based incentives to avoid barely missing earnings thresholds (Graham, Harvey, & Rajgopal [2005]), we are not able to document short-term price reactions as being a valid motivation for this behavior. Researchers should continue to explore managers' beliefs related to market-based incentives and investigate additional reasons why managers are motivated to manipulate earnings at these thresholds.⁷

7. For example, Frankel, Mayew, and Sun (2010) test whether investor relations costs increase when a firm misses the analyst forecast threshold by a penny. They document that conference call length increases by 3 percent and conclude that while this result is statistically significant, it is not economically meaningful. Thus, they are not able to document an economic rationale for why managers would take action to avoid barely missing the analyst forecast threshold.

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