Financial reporting frequency and investor myopia

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This version: March 31st, 2018

Keywords: Financial reporting frequency; investor myopia; myopic pricing

Acknowledgements: We appreciate helpful comments from Hyesun Chang, Andrew Jackson, Theo Sougiannis, Oktay Urcan, Wei Zhu and workshop participants at the National University of Singapore, Singapore Management University, University of Georgia Ph.D. seminar, University of Illinois at Urbana-Champaign, and 2018 UTS Australian Summer Accounting Conference.

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Abstract

Critics of mandatory quarterly reporting have long claimed that more frequent reporting leads to investor myopia. This study directly tests this claim by exploring mandatory increases in financial reporting frequency in the U.S. over the period of 1954 to 1972 to examining the effect of reporting frequency on investors' myopic pricing of earnings. Our difference-in-differences analyses show that the mandatory reporting frequency increase is associated with an increase in the weight investors put on long-term earnings and a decrease in the weight investors put on near-term earnings. We further find that the mandatory reporting frequency increase is associated with an increase in the extent to which stock returns reflect future earnings information. Overall, these findings are contrary to the critics' claim and suggest that higher reporting frequency mitigates investor myopia by providing investors more information on future earnings. However, we also find that this mitigating effect of higher reporting frequency on investor myopia disappears among the subset of firms where the mandatory reporting frequency increase likely attracted more short-term investors.

1 Introduction

Mandatory reporting frequency has been a subject of heated debate among regulators, investors, and companies for decades. At the heart of this debate is the wide-spread, long-standing claim from critics that more frequent reporting leads investors and managers to focus excessively on near-term performance and thereby make myopic decisions. For example, U.K. regulators eliminated quarterly reporting requirements in 2014, concluding that "rigid quarterly reporting requirements can promote an excessive focus on short-term results by company management and investors" (FCA 2014). In the U.S., this claim has also raised significant concerns among regulators and business leaders. For example, Director of the Division of Corporation Finance at the SEC, Alan Beller, recognized the concern that "…quarterly reports encourage short-termism on the part of investors, with excessive focus on short-term numbers and insufficient attention to longer term trends in value and the business" (Beller 2004). Recently, these concerns have led many commentators to call for an end to mandatory quarterly reporting (Benoit 2015; Berlau and Kuiper 2015), and prompted the SEC to discuss the merits and demerits of discontinuing quarterly reporting (Higgins 2016).

This policy debate has spurred an emerging literature examining the impacts of reporting frequency. However, extant research has largely focused on the effects on managers' myopic decisions (e.g., Ernstberger et al. 2016; Kraft et al. 2017; Nallareddy et al. 2017). Surprisingly, to the best of our knowledge, no research to date has examined how reporting frequency influences investors' (myopic) pricing decisions – another key concern expressed by critics of frequent reporting. Besides the direct implications for the ongoing policy debate on reporting frequency, understanding how reporting frequency affects investors' myopic pricing is important in its own right, because myopic pricing can reduce the market efficiency in resource allocation and induce

managers to make myopic investment decisions. In this study we examine how reporting frequency affects investors' myopic pricing of earnings in the sense of overweighing near-term earnings and underweighting long-term earnings (Abarbanell and Bernard 2000; Bushee 2001).

Despite the long-standing claim by critics of frequent reporting, it is unclear theoretically whether more frequent reporting will increase or decrease investors' myopic pricing of future earnings. On the one hand, it is commonly argued that myopic pricing is caused by short-term investors in the equity market who trade frequently to maximize short-term capital gains (Gigler et al. 2014). These short-term investors care about short-term performance rather than long-term cash flows and trade aggressively on short-term earnings that may not reflect long-term firm value (Froot et al. 1992). Their excessive focus on short-term earnings can result in an overweighting (underweighting) of short-term (long-term) earnings. Consistent with this argument, Bushee (2001) finds evidence that institutional investors with short investment horizons exhibit preferences for near-term earnings over long-term value, and the proportion of such investors is associated with myopic pricing of future earnings. Therefore, to the extent that more frequent reporting attracts more of such short-term investors, it can lead to more myopic pricing of future earnings.

On the other hand, however, more frequent reporting can mitigate myopic pricing by providing investors with more, timelier information that facilitates their valuation of both short-term and long-term earnings. Interim reports provide valuable new information about not only near-term earnings but also long-term earnings. For example, the trend and seasonal pattern of interim earnings provide incremental information beyond annual earnings on firms' ability to generate long-term cash flows (Bernard and Thomas 1990). Additional financial information provided in quarterly reports (e.g., order backlog) can also allow investors to better assess

managers' progress in implementing their strategies to achieve the firm's long-term goals. Further, more frequent reporting potentially increases analysts' following (Nallareddy et al. 2017), which in turn enhances information production (Lang and Lundholm 1993). More information generated by more frequent reporting, directly or indirectly, can help investors more efficiently predict and price future earnings, resulting in less myopic pricing of future earnings.

To identify the effect of reporting frequency on myopic pricing, we follow prior research (e.g., Butler et al. 2007; Fu et al. 2012; Kraft et al. 2017) to explore the staggered mandatory reporting frequency increases in the U.S. over the period of 1954 to 1972 as an exogenous shock to reporting frequency. Using hand-collected reporting frequency data for U.S. firms over the period of 1952 to 1974, we first identify firms that involuntarily increased reporting frequency (mandatory switchers). For each mandatory switcher, we then identify a propensity score matched control firm with similar firm size, growth, and performance at the beginning of the event year (i.e., the year the matched mandatory switcher increased reporting frequency). The control firms are identified from the population of firms that already voluntarily switched to a higher reporting frequency at least two years prior to the event year. We then conduct a difference-in-difference analysis comparing changes in myopic mispricing from the two-year pre-event period to the two-year post-event period for mandatory switchers relative to their matched control firms. To gauge investors' myopic pricing, we follow Abarbanell and Bernard (2000) and Bushee (2001) and conduct a price-level test of investors' weighting of future short-term versus long-term earnings.

We find that relative to control firms, mandatory switchers exhibit a significant decrease in myopic pricing of future earnings around the mandatory switch to more frequent reporting. More specifically, we find no evidence of myopic pricing in either the pre- or post-switch periods

for control firms. In contrast, for mandatory switchers, we find that investors overweight near-term earnings and underweight long-term earnings in the pre-event period, but this myopic pricing of future earnings significantly decreases in the post-event period. Further, our falsification tests that examine two pseudo-event years around the mandatory switch (i.e., two years prior to the actual switching year and two years after the actual switching year) yield no evidence of a relative change in myopic pricing for mandatory switchers relative to control firms around either of these two adjacent pseudo-event years. These results suggest that our results are not confounded by a general trend in investors' pricing for mandatory switchers.

To corroborate our price-level tests and provide evidence on the channel through which reporting frequency mitigates myopic pricing of earnings, we further examine the effect of mandatory frequency increases on the extent to which current stock prices reflect information about future earnings. If more frequent reporting mitigates myopic pricing by providing investors with more information about future earnings, we should expect an increase in the informativeness of a firm's current returns with respect to its future earnings after the firm switches to more frequent reporting (Lundholm and Myers 2002). This is indeed what we find in the data. Relative to control firms, mandatory switchers exhibit a significant increase in the future earnings response coefficient (FERC) after the mandatory reporting frequency increases.

While we find a decrease in investor mispricing on average, it is possible that this average result may not hold or may even reverse for the subset of firms with increases in pressure from short-term investors. Given the unavailability of data on investor composition (e.g., institutional ownership data) during our sample period, we hand-collect managerial guidance of near-term earnings or revenue for our sample firms, and use increases in the short-term managerial guidance after mandatory frequency increases to identify firms that face higher pressure from

short-term investors. This proxy is reasonable because prior research shows that a primary driver of managers issuing guidance of near-term earnings is demand from short-term investors (e.g., Houston et al. 2010; Chen et al. 2011; Karageorgiou et al. 2014; Kim et al. 2017). We find that a significant proportion (31%) of mandatory switchers issued more managerial guidance of near-term earnings or revenue, relative to their matched control firms, after mandatory frequency increases. More importantly, differing from our average results, we do not find any decrease in myopic pricing of earnings for this subsample of firms. This finding suggests that more frequency reporting is unlikely to mitigate investor myopia when it results in greater pressure from short-term investors.

Our finding of a decrease in investor myopic pricing may appear to be inconsistent with the decrease in managers' investments documented by Kraft et al.'s (2017). However, it is important to note that although myopic pricing is one channel for reporting frequency to induce managerial myopia, frequent reporting can induce managerial myopia through channels unrelated to mispricing, such as managerial compensation and career concerns (e.g., Fundenberg and Tirole 1995; Hall and Murphy 2003; Graham et al. 2005). Thus, one possibility is that the increased pressure from short-term investors after mandatory frequency increase leads at least some firms to tie managerial compensation to near-term earnings more strongly, inducing their managers to cut long-term investments. While we cannot directly test this possibility due to the unavailability of compensation data during our sample period, we find that the investment decrease documented by Kraft et al. (2017) is concentrated in firms with an increase in short-term managerial guidance. As mentioned above, these firms are most likely to face greater pressure from short-term investors, and exhibit no decrease in myopic pricing after the frequency increase.

Our study contributes to our understanding of the economic consequences of mandatory reporting frequency. Prior research examines the effects of higher reporting frequency on earnings timeliness (Butler et al. 2007), cost of capital (Fu et al. 2012), and myopic managerial behavior (Ernstberger et al. 2016; Kraft et al. 2017; Nallareddy et al. 2017). To our knowledge, we are the first study to examine how reporting frequency affects investor myopia. In contrast to the common claim that more frequent reporting leads investors to focus excessively on short-term performance and price firms myopically, we find that more frequent reporting increases the amount of information impounded into stock prices and reduces myopic pricing on average. Our results also highlight that the effect of more frequent reporting on myopic pricing varies across firms, depending on whether more frequent reporting attracts more short-term investors. Our findings offer important implications for the ongoing debate among regulators and practitioners on the desirability of mandatory quarterly reporting requirements in the U.S.

Our study also adds to the literature on investors' myopic pricing of earnings. While Abarbanell and Bernard (2000) find no evidence of myopic pricing of earnings for all firms on average, Bushee (2001) demonstrates that short-term institutional investors exhibit preferences for near-term earnings over long-term firm value and ownership by such short-term investors is positively associated with myopic pricing of earnings. Kim et al. (2017) find that quarterly earnings guidance is associated with higher ownership by short-term institutional investors and more myopic pricing of earnings. We extend this line of research by examining how reporting frequency influences myopic pricing of earnings. We document that differing from voluntary earnings guidance, mandatory frequent reporting mitigates myopic pricing of earnings. Consistent with Bushee (2001), we show that short-term investors play an important role in determining the effect of reporting frequency on myopic pricing across firms.

2 Related research and hypothesis development

2.1 Related research

Our study belongs to the growing literature on the economic consequences of mandatory financial reporting frequency. One line of research in this literature examines the capital markets effects of mandatory reporting frequency in and outside the U.S. McNichols and Manegold (1983) examine 34 AMEX firms that involuntarily switched from annual to semiannual reporting in the early 1960s, and find that the semiannual reports preempt information in annual reports. Butler et al. (2007) find little evidence that higher reporting frequency increases the timeliness of earnings information being incorporated into stock prices for a sample of 82 NYSE/AMEX firms that mandatorily switched from semiannual to quarterly reporting over 1967-1971. Using a sample similar to Butler et al., Fu et al. (2012) find that higher reporting frequency reduces information asymmetry and the cost of equity. Overall, this line of work suggests that more frequent reporting conveys useful information to the market that leads to capital market benefits.

The second line of research examines the effect of mandatory reporting frequency on managers' myopic behavior. Early studies show theoretically that higher reporting frequency can lead managers to take actions that increase short-term earnings at the expense of long-term firm value (e.g., Gigler et al. 2014; Edmans et al. 2016). For example, Gigler et al. (2014) develop costs and benefits of higher reporting frequency in a rational expectations equilibrium, and show that more frequent reporting generates short-term earnings that less likely reflect long-term value-creating projects, thereby exacerbating managers' disincentives to invest in such long-term projects. More recently, three studies provide empirical evidence on the effect of mandatory financial reporting on managerial myopia. Similar to Butler et al. (2007) and Fu et al. (2012), Kraft et al. (2017) examine U.S. firms' mandatory increases in reporting frequency in the 1950s-1970s.

They show that firms significantly reduce their investment expenditures following the increase in reporting frequency. This reduction in investment is associated with lower future profitability and sales growth, consistent with more frequent reporting inducing myopic managerial investment behavior. Using the introduction of mandated interim management statements (IMS) in the European Union, Ernstberger et al. (2017) find an increase in real activities management for firms that mandatorily switched from semiannual to quarterly IMS reporting, consistent with increased reporting frequency resulting in managerial short-termism. In contrast, exploiting both the start and the end of the quarterly IMS reporting requirement in the United Kingdom, Nallareddy et al. (2017) find that mandating quarterly reporting has little effect on firms' investment decisions.

To our knowledge, no prior research has examined how mandatory reporting frequency influences investor myopia. This is an important omission because investor myopic pricing has long been a major concern expressed by regulators and investors in the ongoing debate on reporting frequency in the U.S. and worldwide. It is important to note that investor myopia is distinct from managerial myopia, and evidence on the effect of mandatory reporting frequency on managerial myopia does not necessarily extend to investor myopia. Managerial myopia can exist without myopic pricing of firms (Stein 1989). As Kraft et al. (2017) point out, managers can behave myopically even in efficient capital markets, as long as (1) managers are concerned about short-term earnings and stock prices (e.g., career concerns or stock-based compensation) when making investment decisions and (2) there exist information asymmetries between managers and investors about the investment projects. Specifically, due to information asymmetry, investors may not recognize that some investments will payoff only in the long-term. They may attribute lower short-term earnings from such investments to managers' poor investment decisions and negatively evaluate the firm/manager in the short-term. This in turn prompts managers to avoid investments

that payoff only in the long-term. In this regard, we add to the mandatory reporting frequency literature by providing the first evidence on the impact of higher reporting frequency on investors' myopic pricing of future earnings.

2.2 Setting and hypotheses

Consistent with prior research (Butler et al. 2007; Fu et al. 2012; Kraft et al. 2017), we use the mandatory reporting frequency increases in the U.S. as our research setting. Before the Securities Act of 1934, stock exchanges made separate decisions regarding their listed firms' reporting frequencies. The New York Stock Exchange (NYSE) began pushing for interim reporting in the 1920s, although it faced opposition from many of its listed firms and had little power for enforcement. Throughout the 1920s and 1930s, the exchange continued to push its firms to report quarterly, and in 1939 NYSE required quarterly reporting in its listing agreement.[1] Although NYSE had difficulty enforcing quarterly reporting for some time, by the mid-1950s, approximately 90% of active U.S. firms listed on the exchange were issuing quarterly reports (Taylor 1963; Kraft et al. 2017). In 1962, the American Stock Exchange (AMEX) began to require quarterly reporting for its newly listed firms and strongly encouraged firms already listed to adopt quarterly reporting. The SEC's mandatory requirements on reporting frequency started in 1934 when firms were required to report financial statements on an annual basis. The SEC mandated semi-annual reporting in 1955 and quarterly reporting in 1970. Thus, by 1971, all publicly listed firms in the U.S. were required to file quarterly reports. We focus on U.S. firms that involuntarily

[1] Leftwich, Watts, and Zimmerman (1981) provide additional detail on the evolution of reporting requirements by NYSE and AMEX. They note that although NYSE required quarterly reporting by 1939, approximately 100 NYSE-listed firms were not issuing quarterly reports, and thus it is unclear how effectively NYSE was able to mandate the requirement at that time.

increased reporting frequency due to the SEC mandates in 1955 and 1970 or due to the pressure from the stock exchanges from years 1962 to 1964.[2,3]

We focus on U.S. firms rather than European Union firms (who under the 2004 directive were required to provide interim management statements) because, unlike in the U.S. where firms are required to report quarterly financial statement information such as quarterly revenues and net income, firms in the European Union are required to report only qualitative information. Nallareddy et al. (2017) find that 94 percent of firms that mandatorily adopted the interim management statements requirement in the UK issued qualitative disclosures that did not include quarterly earnings information. Qualitative disclosures are unlikely to pick up the effects of quarterly reporting in a meaningful way. In support of this argument, Nallareddy et al. (2017) find no evidence of managerial myopia in the European Union setting.

Prior theoretical and empirical work (e.g., Froot et al. 1992; Gigler et al. 2014; Bushee 2001) suggests that myopic pricing arises from short-term investors who trade frequently to maximize short-term capital gains. Gigler et al. (2014) note that short-term investors are essential for the existence of price pressure. They trade aggressively on short-term earnings that may not reflect long-term firm value, and their excessive focus on short-term earnings can result in myopic pricing of the firm's stock – an overweighting (underweighting) of short-term (long-

[2] In untabulated tests, we find that our results are robust to focusing only on firms that involuntarily increased reporting frequency due to the SEC mandates.

[3] Although characteristics of the U.S. economy and capital markets in particular have changed since the 1950s – 1970s, short-termism at the managerial and the investor level was already a concern at this time (Kraft et al. 2017). Warren Buffett, in a letter to his partners written May 1969, laments that "a swelling interest in investment performance has created an increasingly short-term oriented and…more speculative market" (Buffet 1969). Many classical economists also expressed concerns about the short-term focus (e.g., Pigou 1920). John Maynard Keynes (1936) notes that "For most of [the professional investors and speculators] are, in fact, largely concerned, not with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public. They are concerned, not with what an investment is really worth to a man who buys it 'for keeps,' but with what the market will value it at, under the influence of mass psychology, three months or a year hence."

term) earnings (Abarbanell and Bernard 2000). Bushee (2001) provides empirical evidence in support of the link between short-term investors and myopic pricing. He shows that institutional investors who trade frequently to maximize short-term gains exhibit preferences for short-term earnings over long-term value, and their ownership in a firm is positively associated with the degree of myopic pricing of future earnings.

An immediate and natural consequence of more frequent reporting is the availability of more short-term performance information to investors.[4] Prior research suggests that the availability of short-term performance information attracts short-term investors and/or shifts more of existing investors' attention from long-term value creation to short-term stock prices. For example, Kim et al. (2017) find that managerial short-term earnings guidance is associated with an increase in short-term investors and a decrease in long-term investors. Thus, more frequent mandatory reporting could increase the proportion of short-term investors in the firm's investor base and thereby exacerbate investors' myopic pricing of future earnings. These arguments and evidence lead to the following hypothesis:

H1A: The increase in financial reporting frequency is associated with more myopic pricing of future earnings, *ceteris paribus*.

On the other hand, more frequent reporting enhances information transparency and provides more useful information that facilitates investors' valuation of the firm. First, interim reports provide valuable new information about not only near-term earnings, but also long-term earnings. The trend and seasonal pattern of interim earnings provide incremental information beyond annual earnings on firms' ability to generate long-term cash flows (Bernard and Thomas

[4] However, as noted by Fu et al. (2012), more frequent reporting may not increase the quality of information for two reasons. First, unlike annual financial statements, quarterly statements are not audited. Second, quarterly earnings may contain more biases due to greater discretion managers have in making estimates.

1990; Ball and Bartov 1996; Collins and Hribar 2000). Second, more frequent mandatory reporting likely spurs more voluntary disclosure by management (e.g., Li and Yang 2016). Third, more frequent reporting lowers analysts' information collection and processing costs and increases analyst following (e.g., Rahman et al. 2007; Nallareddy et al. 2017). The enhanced information environment helps investors evaluate and price short-term and long-term earnings. It also enhances the stock's liquidity and mitigates the price pressure that leads to myopic pricing. This discussion leads to the following hypothesis:

H1B: The increase in financial reporting frequency is associated with less myopic pricing of future earnings, *ceteris paribus*.

3. Sample Selection of event and matched control firms

We focus on U.S. firms that involuntarily switched their reporting frequency due to the SEC mandates in 1955 and 1970, or because of the pressure to switch to quarterly reporting by AMEX from years 1962 to 1964. Focusing on firms that involuntarily increased their reporting frequency reduces endogeneity concerns associated with firms' *voluntary* decisions to increase reporting frequency. We identify the involuntary, or mandatory, switchers following the approach in Butler et al. (2007), Fu et al. (2012), and Kraft et al. (2017). Specifically, we begin with all firms trading on the NYSE and AMEX exchanges that are in the CRSP/Compustat merged file from 1950 to 1973. We exclude firms in industries typically subject to different SEC disclosure requirements (i.e., railroads and other transportation (SIC 40 – 41); utilities (SIC 49); financial services, insurance, and real estate (SIC 60 – 67); and firms whose SIC code begins with 9; Butler et al. 2007). We then use the *Moody's Industrial News Reports* to identify firms' reporting frequencies and specifically detect when firms changed their reporting frequencies. This results in

an initial sample of 243 firms that involuntarily increased their financial reporting frequency (i.e., 27 firms changing from annual to semi-annual reporting and 216 firms from semi-annual to quarterly reporting).

To alleviate the concern that firm-specific factors may drive our results, we use propensity score matching to identify a set of matched control firms from firms that had previously voluntarily switched to a higher reporting frequency. First, for each involuntary event firm that changed from semi-annual (annual) to quarterly (semi-annual) reporting, we identify a matched control firm that maintained quarterly (semi-annual) reporting during the two years before, year of, and two years following the event firm's reporting change. Next, we estimate a propensity score model to match each involuntary event firm to a control firm with the closest propensity score in the event year. The propensity score model includes log market value of equity (*SIZE*), profitability (*ROA*), market-to-book value of equity (*MB*) at the beginning of the event year, and industry (i.e., 2-digit SIC) and year fixed effects.[5] Table 1 Panel A reports the differences between event and control firms' *SIZE*, *ROA* and *MB*. As expected, we find no significant differences, which suggests successful matching.

As a result of the propensity score matching, we have a final sample of 196 event firms that involuntarily increased their reporting frequency. This includes 21 firms that switched from annual to semi-annual reporting beginning in 1954, consistent with the SEC's mandate; 10 firms listed on AMEX that switched to quarterly reporting between 1962–64 in response to AMEX's increasing pressure to do so; and 165 firms that switched to quarterly reporting after 1967 in response to the SEC's updated mandate.[6] We define the first year during which a firm issued a

[5] In Section 6, we conduct additional tests to ensure that our results are robust to alternate matching procedures, including matching based on industry.

[6] Although the SEC mandated quarterly reporting for quarters ending after 12/31/1970, we follow Butler et al. (2007), Fu et al. (2012), and Kraft et al. (2017), and also consider firms that switched to quarterly reporting in the three years

quarterly (semi-annual) report as the event year. We collect data for the two years prior to the event year and the two years subsequent to the event year for each of the event and matched control firms, resulting in a final sample of 1,514 firm-years.[7]

Stock price and financial data is primarily obtained from the CRSP/Compustat merged database. If the data is missing in the CRSP/Compustat merged database for a certain firm-year, we manually collect values from Moody's Industrial Manuals, consistent with the approach followed in prior literature (e.g., Kraft et al. 2017).

4. Research Design

4.1 Price-level test of myopic pricing

To capture myopic pricing of future earnings, we use the Ohlson (1995) valuation model as empirically adopted by Abarbanell and Bernard (2000) and Bushee (2001). Ohlson (1995) separates firm value (P_t) into book value (b_t) and expected present value of all future abnormal earnings.[8] Abnormal earnings are defined as actual earnings (x_t) minus normal earnings, wherein normal earnings is the prior book value times a rate of return (proxied by the cost of equity capital (r)).

$$P_t = b_t + \sum_{\tau=1}^{\infty} (1+r)^{-\tau} E_t(x_{t+\tau} - r \times b_{t+\tau-1}) \qquad (1)$$

prior to the official mandate as "involuntary" switchers. As there was a significant amount of discussion at the SEC prior to the date the quarterly reporting requirement became effective, it is likely that these firms increased their reporting frequency in anticipation of the upcoming requirement.

[7] Although we collect data for two years before and after the event, a few firms have only one year's data in the pre- or post-event periods, resulting in our final sample of 1,514 firm-years.

[8] Although this relation assumes clean surplus accounting (i.e., the change in book value is equal to earnings minus net dividends), prior literature argues that Equation (1) still provides a valid basis for valuation (Penman and Sougiannis 1998; Abarbanell and Bernard 2000). In particular, departures from clean surplus accounting are small and likely to add noise rather than bias (Abarbanell and Bernard 2000).

Equation (1) is the basis for our price level test. Abarbanell and Bernard (2000) note that at time *t*, the expected price-to-book value premium over a future horizon T is equal to the discounted abnormal earnings for years beyond T.

$$E_t(P_{t+T} - b_{t+T}) = \sum_{\tau=T+1}^{\infty} (1+r)^{-\tau} E_t(x_{t+\tau} - r \times b_{t+\tau-1}) \qquad (2)$$

Following Abarbanell and Bernard (2000) and Bushee (2001), we consider the short run to be one year in the future and the long term to be beyond one year in the future. Under this assumption, substituting Equation (2) into (1) at T=4 for the terminal premium, provides an expression of firm value that is separated into three components:

$$\begin{aligned} P_t &= b_t + [(1+r)^{-1} E_t(x_{t+1} - r \times b_t)] \\ &\quad + [\sum_{\tau=2}^{4} (1+r)^{-\tau} E_t(x_{t+\tau} - r \times b_{t+\tau-1}) + (1+r)^{-4} E_t(P_{t+4} - b_{t+4})] \\ &= BV_t + PVAX_t + PVTV_t \end{aligned} \qquad (3).$$

BV is the portion of firm value that has already been captured by the accounting system. *PVAX* is the portion of firm value that will be realized through accounting earnings in the near term (i.e., next year *t+1*). *PVTV* is the part of firm value that will take the longest to flow through the accounting system. *PVTV* is the sum of (1) the present value of the residual incomes during years *t+2* through *t+4* and (2) the present value of the terminal value at the end of year *t+4*.

Based on Equation (3), we test for myopic pricing with the following regression:

$$P_t = a_0 + a_1 BV_t + a_2 PVAX_t + a_3 PVTV_t + \eta_t \qquad (4).$$

P is the firm's stock price at the end of the first quarter after fiscal year *t*.[9] *BV* is the book value of equity as of the end of the fiscal year *t*, scaled by the number of outstanding shares. *PVAX* is the

[9] To mitigate the possibility that quarterly reported earnings might influence the analysis, we use the stock price at the end of the first quarter after fiscal year *t* (i.e., 3 months after the end of fiscal year *t*). In untabulated analyses, following

present value of the ex-post residual earnings in the fiscal year *t+1* (i.e., $(EPS_{t+1} - r \times BV_t) \div (1+r)$). The discount rate *r* is computed following the CAPM with firm-specific betas and assumed risk premium over the risk-free rate of 6% (Bushee 2001).[10] *PVTV* is the sum of (1) the present value of the residual incomes during years *t+2* through *t+4* (i.e., $\sum[(EPS_{t+i} - r \times BV_{t+i-1}) \div (1+r)^i]$; $i = 2, 3, 4$), and (2) the present value of the terminal value at the end of year *t+4* (i.e., $(PB \times BV_{t+4} - BV_{t+4}) \div (1+r)^4$; *PB* is the price-to-book ratio as of the pricing date).

Since analysts' forecast data on firms' yearly earnings, earnings growth, or future stock price are unavailable for our sample period, we follow Penman and Sougiannis (1998) and use realized values in computing the components of the equation. This assumes that ex-post realizations equal investors' ex-ante expectations, potentially inducing measurement error. We address this issue in Section 5.4. We control for year fixed effects and compute statistics using standard errors clustered by industry and year.

In Equation (4), a_1 denotes investors' weight on past earnings, a_2 denotes investors' weight on future short-term earnings, and a_3 represents the weight on future long-term earnings. As each component is discounted to present value, an additional dollar of *PVAX* or *PVTV* should increase price by one dollar. Thus, $a_1 = a_2 = a_3 = 1$.[11] Abarbanell and Bernard (2000) and Bushee (2001) find that a_1 is not significantly different from 1. However, they find that a_2 (a_3) is significantly greater (less) than 1.

Bushee (2001), we also use the stock price at the end of the second quarter after fiscal year *t* (i.e., 6 months after the end of fiscal year *t*) and find the consistent results.

[10] Our results are robust to using a risk premium of 4% and a constant discount rate of 10%.

[11] Because we have year fixed effects, we do not interpret the intercept, a_0, which should be 0 in the absence of year fixed effects.

To test how a change in reporting frequency affects the pricing of short-term and long-term earnings, we extend Equation 4 allowing *BV*, *PVAX*, and *PVTV* to vary for event and matched firms across the pre- and post-event periods:

$$P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + {}_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t \quad (5).$$

EVENT is an indicator variable equal to one for the involuntary switcher (i.e., event) firm and equal to zero for the matched control firm. *POST* is an indicator variable equal to one for the two years after the event year and zero for the two years before the event year. We omit the event year from our analyses, consistent with prior studies. $\gamma_2 + \gamma_6$ ($\gamma_3 + \gamma_7$) captures the weight of short-term (long-term) earnings on prices for event firms in the period before the increase in frequency. γ_6 (γ_7) captures the incremental weight of short-term (long-term) earnings on prices for event firms relative to matched firms in the pre-event window. γ_{14} (γ_{15}) captures the change in the weight of short-term (long-term) earnings on prices for event firms from the pre- to post-event window, relative to that for matched control firms. $\gamma_2 + \gamma_6$ ($\gamma_3 + \gamma_7$) greater (less) than 1 indicates that event firms' short-term (long-term) earnings are mispriced in the pre-event window. $\gamma_2 + \gamma_6 + \gamma_{10} + \gamma_{14}$ ($\gamma_3 + \gamma_7 + \gamma_{11} + \gamma_{15}$) greater (less) than 1 indicates that event firms' short-term (long-term) earnings are mispriced in the post-event window. A finding of $\gamma_{14}>0$ and $\gamma_2 + \gamma_6 + \gamma_{10} + \gamma_{14} >1$; $\gamma_{15}<0$ and $\gamma_3 + \gamma_7 + \gamma_{11} + \gamma_{15} <1$ would provide support for reporting frequency increasing myopic pricing (i.e., hypothesis H1A). Alternatively, a finding of $\gamma_2 + \gamma_6 >1$, $\gamma_6 >0$, and $\gamma_{14}<0$; $\gamma_3 + \gamma_7 <1$, $\gamma_7 <0$, and $\gamma_{15}>0$ would provide support for reporting frequency decreasing myopic pricing (i.e., hypothesis H1B). The equation also includes year fixed effects (*YEARDUM*) to control for any macro effects. Standard errors are clustered by industry and year.

5. Results

5.1 Descriptive Statistics

Table 1 Panel B reports the descriptive statistics of 1,514 observations for 196 pairs of event and matched control firms. Consistent with prior research (Bushee 2001), we find that much of firm value is concentrated in book value, followed by terminal value, and then the short-term earnings component. The average firm size (in log value) is 3.187 and average market-to-book ratio is 2.535. On average, firms exhibit positive performance.

5.2 Results on price-level test of myopic pricing

Table 2 Panel A reports the baseline results of the mispricing model (Equation 4), replicating Abarbanell and Bernard (2000) and Bushee (2001). Column 3 reports the p-values that test whether the coefficient is different from zero. Column 4 reports the p-values that test whether the coefficient is different from one, which is the null hypothesis. The coefficient on *BV* is 1.015 and is not significantly different from one. However, the coefficient on *PVAX* is significantly greater than 1 (a_2 = 2.258), and the coefficient on *PVTV* is significantly less than 1 (a_3 = 0.756). These results are similar to those reported by Abarbanell and Bernard (2000) and Bushee (2001).[12]

Table 2 Panel B reports our main result of estimating Equation 5. γ_2 (γ_3) and $\gamma_2 + \gamma_{10}$ ($\gamma_3 + \gamma_{11}$) are not significantly differently from 1, consistent with no mispricing of short-term (long-term) earnings of matched firms in the periods before and after the increase in frequency. We find that γ_6 (γ_7) is significantly positive (negative), consistent with the notion that investors of event firms place more (less) weight on short-term (long-term) earnings than they do for matched control firms in the period before the increase in frequency. $\gamma_2 + \gamma_6$ ($\gamma_3 + \gamma_7$) is significantly greater (less) than 1,

[12] Because we have year dummies in the regression, the intercept is not meaningful.

consistent with short-term (long-term) earnings of event firms being mispriced prior to the increase in frequency. We also find that γ_{14} (γ_{15}) is significantly negative (positive), such that $\gamma_2 + \gamma_6 + \gamma_{10} + \gamma_{14}(\gamma_3 + \gamma_7 + \gamma_{11} + \gamma_{15})$ is not significantly differently from 1. This evidence is collectively consistent with increased frequency mitigating the positive (negative) weight of short-term (long-term) earnings in event firms relative to that in matched firms. In sum, these results suggest that increased financial reporting frequency mitigates investor mispricing, supporting H1B (and not H1A).

5.3 Falsification Test

To further support that the myopic pricing results we document in Table 2 Panel B are related to the mandated change in frequency and not to some unknown general trend in myopic pricing, we conduct a falsification test wherein we examine the change in mispricing surrounding a pseudo-event year (i.e., when there should not be any effect of the mandated change in frequency). Specifically, we estimate Equation 5 around pseudo-event years, which are exactly two years *before* or *after* each firm's mandated frequency increase year. In contrast to our expectation as in Table 2, we do not expect that increased reporting frequency mitigates investor mispricing around these pseudo-event years. In particular, when the pseudo-event year is two years prior to the actual switching year (i.e., when control firms report more frequently than event firms for both the pre- and post-event windows), mispricing of earnings for the event firms would likely be significant relative to control firms for the period before the pseudo-event year and continue to be so in the period after the pseudo-event year. On the other hand, when the pseudo-event year is two years subsequent to the actual event year (i.e., when event firms report as frequently as do control firms for both the pre- and post-event windows), mispricing of earnings for the event firms would be no longer significant relative to control firms for the periods before and after the pseudo-event year.

For the falsification test setting the pseudo-event year at two years prior to the actual switching year, we have a sample of 1,204 firm-years.[13] Panel A of Table 3 report the results. Similar to Table 2, $\gamma_2 + \gamma_6 > 1$ and $\gamma_6 > 0$; $\gamma_3 + \gamma_7 < 1$ and $\gamma_7 < 0$, which indicates a mispricing of earnings for event firms, relative to matched control firms, in the period before the pseudo-event year. In contrast to Table 2, we find no evidence on $\gamma_{14}<0$ or $\gamma_{15}>0$, which suggests that the mispricing sustains after the pseudo-event year.

For the falsification test setting the pseudo-event year at two years subsequent to the actual switching year, we have a sample of 1,498 firm-years. Panel B of Table 3 reports the results. Inconsistent with the results in Table 2, but consistent with our expectations, we find no evidence that $\gamma_2 + \gamma_6 > 1$, $\gamma_6 > 0$, or $\gamma_{14}<0$; $\gamma_3 + \gamma_7 < 1$, $\gamma_7 < 0$, or $\gamma_{15}>0$, which suggests no mispricing of event firms, relative to control firms, in both the pre- and post-event periods. Overall, these two falsification tests provide comfort that our main results in Table 2 are attributable to the mandated change in reporting frequency, and not to some unknown general trend in myopic pricing.

5.4 Future ERC tests

Although our main test of investor myopia is based on the well-established Ohlson (1995) pricing model that specifies theoretical coefficient values, an alternative explanation for the results in Abarbanell and Bernard (2000), Bushee (2001), and our Table 2 is based on measurement error in the data. For example, measurement error in the discount rate or in using ex-post realized values as proxies for market expectations of future value may bias the coefficients in Equations 4 and 5 and make it appear like market mispricing. However, irrespective of the underlying cause, for

[13] We verify whether each matched control firm maintained a higher-reporting frequency – as required in the original sample selection – for the two years before and after the pseudo-event year; if not, we exclude the matched control firm and its corresponding event firm from this falsification test.

measurement error to bias our findings, it would have to vary across event and matched firms around the frequency increase event in a pattern consistent with our story. We are not aware of a reason why measurement error would vary in that fashion. Nevertheless, to corroborate our price-level tests and illustrate the channel through which reporting frequency mitigates myopic pricing of earnings, we perform an alternative test using a different methodology. We rely on the notion that investor myopia of current earnings implies that returns reflect less of future earnings. If the increase in reporting frequency provides investors with more information about the firm's future performance, we should then observe that the increase in reporting frequency enhances the ability of returns to reflect future earnings. To test this notion, we rely on the following baseline future ERC model from Collins et al. (1994) as adopted by Lundholm and Myers (2002):

$$R_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t3} + \beta_4 R_{t3} + \varepsilon_t \quad (6),$$

where R_t is the cumulative return for one-year period after the third month of the fiscal year *t*.[14] X_{t-1} is income before extraordinary items in fiscal year *t-1*, scaled by market value of equity as of the beginning of the year. X_t is income before extraordinary items in fiscal year *t*, scaled by market value of equity as of the beginning of the year. X_{t3} is the sum of income before extraordinary items in fiscal years *t+1* through *t+3*, scaled by market value of equity as of the beginning of the year. R_{t3} is the sum of the cumulative returns during fiscal years *t+1* through *t+3*, beginning in the third month of the fiscal year *t+1*. We expect b_3 (i.e., the future ERC) to be positive and significant, which suggests that stock returns incorporate relevant information regarding the firm's future earnings performance.

To test if the increase in reporting frequency results in an increase in the ability of returns to reflect future earnings, we extend the above model by allowing X_{t-1}, X_t, X_{t3}, and R_{t3} to vary across

[14] Results are robust to using year-long stock returns from the beginning of the fiscal year.

the pre- and post-event periods for event- and matched control firms. Specifically, we estimate the following regression:

$$R_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t3} + \beta_4 R_{t3} + (\beta_5 + \beta_6 X_{t-1} + \beta_7 X_t + \beta_8 X_{t3} + \beta_9 R_{t3}) \times EVENT + (\beta_{10} + \beta_{11} X_{t-1} + \beta_{12} X_t + \beta_{13} X_{t3} + \beta_{14} R_{t3}) \times POST + (\beta_{15} + \beta_{16} X_{t-1} + \beta_{17} X_t + \beta_{18} X_{t3} + \beta_{19} R_{t3}) \times EVENT \times POST + e_t \quad (7).$$

EVENT and *POST* are as defined earlier. In the period before the frequency increase, if event firm returns reflect future earnings to a lesser extent than matched control firm returns, we expect a negative coefficient on $X_{t3} \times EVENT$ (i.e., $\beta_8 < 0$). Further, if the increase in frequency results in an increase in the ability of event firm returns to reflect future earnings (relative to matched control firm returns), we expect a positive coefficient on $X_{t3} \times EVENT \times POST$ (i.e., $\beta_{18} > 0$).

Since this analysis requires past, current, and future years' stock returns, the sample for this test (1,343 firm-years) is slightly smaller than the main sample. To be consistent with the mispricing test, we control for year-fixed effects and cluster standard errors by industry and year. The results are reported in Table 4. In column 1, we present the results of the baseline model (Equation 6). The coefficient on X_t is significantly positive, consistent with findings in the ERC literature. The coefficient on X_{t3} is also significantly positive, consistent with returns reflecting future earnings (Gelb and Zarowin 2002; Lundholm and Myers 2002). The negative coefficient on X_{t-1} and R_{t3} is also consistent with prior literature. Column 2 reports the results of estimating Equation 7. The coefficient on $X_{t3} \times EVENT$ is significantly negative, consistent with event firm returns reflecting future earnings to a lesser extent than matched firm returns prior to the mandatory reporting frequency increase. Further, the coefficient on $X_{t3} \times EVENT \times POST$ is significantly positive, consistent with the increase in reporting frequency enhancing the ability of event firm returns to reflect future earnings, relative to matched firm returns. Overall, the future ERC test

results are consistent with the mispricing test results reported earlier; that is, an increase in reporting frequency appears to mitigate investor myopia.

5.5 Do mandatory switchers that issue more short-term earnings guidance after the reporting frequency increase experience an increase in investor myopia?

The above tests suggest that *on average* firms that increase reporting frequency experience a decrease in investor myopia. It is, however, possible that this average result may not hold or may even reverse for a subset of firms. For example, more frequent reporting could attract investors with excessive focus on near-term earnings. Since it is not feasible to obtain data on firms' investor composition for our sample period, we hand-collect managerial guidance of near-term earnings or revenue for our sample firms from the Wall Street Journal Index and Moody's Industrial News Reports. We expect that investors with short investment horizon are likely to demand more information on short-term earnings from managers, which in turn puts pressure on managers to provide short-term management forecasts (Ernst and Young 2014). As prior research suggests that a primary determinant for firms issuing near-term earnings guidance is demand from short-term investors (e.g., Houston et al. 2010; Chen et al. 2011; Karageorgiou et al. 2014; Kim et al. 2017), we consider firms' issuance of short-term guidance a reasonable proxy for the composition of short-horizon investors in the firms.[15] In this regard, we examine (1) if the increase in reporting frequency results in significantly more short-term management forecasts; and (2) whether firms that increase short-term guidance around the frequency increase experience an increase in investor myopia.

[15] Some critics assert that it is not the quarterly reports but the short-term management guidance companies issue that leads to managers' and investors' short-termism (e.g., Zimmerman 2015).

Table 5 reports the results. In Panel A, we examine the change in short-term management forecasts (i.e., earnings or revenue guidance with a forecasting horizon of no more than one year) around the increase in reporting frequency. We find that the average number of management forecasts issued by event firms significantly increases after the increase in reporting frequency, whereas matched control firms exhibit a statistically insignificant change in management forecast issuance. Regarding the percentage of firms that issue at least one forecast, we also find similar patterns after the increase in reporting frequency for the event firms versus their matched control firms.[16]

To test whether firms that increase short-term guidance following the increase in reporting frequency experience an increase in investor myopia, we estimate Equation 5 separately to the subsamples of switching firms that increased and of those that did not increase short-term forecasts around the frequency increase event relative to their matched control firms (i.e., 60 pairs- versus 136 pairs of the event and control firms, respectively).[17] Column 1 in Table 5 Panel B reports the results of estimating Equation 5 to the subsample of switching firms that did *not* increase short-term guidance after the reporting frequency increase event. Similar to our main results in Table 2, we find $\gamma_2 + \gamma_6 > 1$, $\gamma_6 > 0$, and $\gamma_{14} < 0$; $\gamma_3 + \gamma_7 < 1$, $\gamma_7 < 0$, and $\gamma_{15} > 0$, for those firms.[18] On the other hand, as presented in Column 2, we find no evidence that $\gamma_{14} < 0$ or $\gamma_{15} > 0$ in the subsample of switching firms that *increased* short-term guidance after the reporting frequency increase. These results provide no evidence that switching firms that increased short-term guidance, relative to

[16] We find that the differences between the changes in the event firms and the matched control firms (i.e., difference in differences) are significant (p-values < 10%).

[17] A firm is classified as having increased short-term guidance if the firm provides more short-term (i.e., forecasting horizon up to one year) management forecasts in the post-event period than in the pre-event period, relative to the concurrent changes in short-term management forecast issuance by its matched control firm. Unless the event firm provides a short-term management forecast in the post-event period, it is not included in the group of firms that increased short-term guidance.

[18] Untabulated tests indicate that neither of ($\gamma_2 + \gamma_6 + \gamma_{10} + \gamma_{14}$) or ($\gamma_3 + \gamma_7 + \gamma_{11} + \gamma_{15}$) is significantly different from 1.

matched firms, along with the increase in financial reporting frequency experience more investor myopia after the frequency increase. Instead, they collectively suggest that our main results in Table 2 are more likely driven by firms that did *not* increase short-term guidance after the reporting frequency increase.

Our main results that investors' myopic pricing decreases after the increase in reporting frequency may appear to be inconsistent with Kraft et al.'s (2017) results that managers' investment decreases after the increase in reporting frequency. It is notable that frequent reporting can induce managerial myopia, independent of investors' mispricing, through such channels as managerial compensation and career concerns (e.g., Fundenberg and Tirole 1995; Hall and Murphy 2003; Graham et al. 2005). For example, an increased pressure from short-term investors after the frequency increase can induce firms to more tightly link managerial compensation to near-term earnings, which in turn lead the managers to cut long-term investments. In this regard, we test whether firms that increase short-term guidance following the frequency increase experience an increase in managerial myopia by estimating the following model as in Kraft et al. (2017):

$$CHPPE_t = \gamma_0 + \gamma_1 EVENT + \gamma_2 POST + \gamma_3 EVENT \times POST + \gamma_4 EBITDA_t + \gamma_5 INVESTOPP_t + \gamma_6 LEVERAGE_t + \gamma_7 CASH_t + \gamma_8 SIZE + \sum INDUSTRY + \sum YEAR\text{-}STATE + \varepsilon_t \quad (8),$$

where *CHPPE* denotes changes in firm investment, as measured by changes in net fixed assets from the pre-event period (i.e., year *t*-2 through *t*-1) to the post-event period (i.e., year *t*+1 through *t*+2) scaled by beginning of year assets.[19] Following Kraft et al. (2017), we control for factors known to affect firm investment, and provide control variable definitions in Appendix A. Table 5

[19] To be consistent with other tests in our study, we continue to use two-year pre- and post-event periods for this analysis. When we test using longer periods around the reporting frequency increase event as do Kraft et al. (2017), we find consistent results.

Panel C presents the results of estimating Equation (8). As presented in Column 1, we find no significant change in long-term investment following the frequency increase event for firms that did *not* increase short-term guidance after the event, relative to matched control firms (i.e., γ_3 is not significantly different from zero). In contrast, we find a significant decrease in long-term investment following the frequency increase event for firms that *increased* short-term guidance after the event relative to matched control firms (i.e., $\gamma_3 < 0$). Taken together, the results in Panel C suggest that the average decrease in firm investment following the financial reporting frequency increase documented in Kraft et al. (2017) is concentrated in firms that increased short-term guidance following the reporting frequency increase.

6. Robustness Tests

6.1 Alternate matching approach

For the analyses presented until this point, we select matched control firms based on a propensity score model that includes industry fixed effects. In this section, we examine the robustness of our results to selecting control firms (with the closest propensity score) from within the same industry (i.e., 2-digit SIC) as the event firm. We lose about 16% of the sample with this restriction. The results are reported in Table 6. Overall, the results are similar to the results in Table 2 Panel B, consistent with increased reporting frequency mitigating investor mispricing.

6.2 Excluding firms that switched from annual to semi-annual reporting

As mentioned earlier, our event firms of involuntarily switchers consist of 27 firms changing from annual to semi-annual reporting, and 216 firms changing from semi-annual to quarterly reporting. In this subsection, we examine the robustness of our results to including only

firms that involuntarily switch from semi-annual to quarterly reporting. The results are reported in Table 7. Overall, the results are similar to the results in Table 2 Panel B, consistent with increased reporting frequency mitigating investor mispricing.

7. Conclusion

This paper examines the effect of mandatory reporting frequency on investor short-termism, as reflected in investors' myopic pricing of future earnings. Focusing on the SEC mandates that required U.S. firms to increase financial reporting frequency from annual reporting to semi-annual reporting and then to quarterly reporting over 1954-1972, we find that the increase in reporting frequency is associated with an increase (decrease) in the weight investors put on long-term (short-term) earnings. These findings are consistent with more frequent financial reporting mitigating investor myopia by conveying more information about the firm's future earnings.

Our study contributes to the recent regulatory and academic debate on the benefits and costs of frequent financial reporting. For example, U.K. regulators recently eliminated quarterly reporting, citing excessive short-term focus by companies, investors, and market intermediaries. In the U.S., the same claim has led many prominent commentators to call for an end to mandatory quarterly reporting and prompted the SEC to consider discontinuing quarterly reporting. Prior research examines the effects of higher reporting frequency on earnings timeliness, cost of capital, and myopic managerial behavior. We extend this literature by examining how reporting frequency affects investor myopia. Contrary to the common claim that more frequent reporting leads investors to focus excessively on short-term performance and to price firms myopically, we find that more frequent reporting actually increases the amount of information impounded into stock prices and reduces myopic pricing. This finding also contrasts managers' claims that

their own myopic behavior is a response to price pressure from investors to produce short-term results (Graham et al. 2005). Our findings have important implications for the ongoing debate among regulators and practitioners on the desirability of mandatory quarterly reporting requirements in the U.S.

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APPENDIX A
Variable Definitions

SIZE	The natural log of market value of equity (CSHO×PRCC_F) as of the beginning of the event year.
ROA	Income before extraordinary items (IB) scaled by lagged total assets (AT) as of the beginning of the event year.
MB	Market value of equity (CSHO×PRCC_F) divided by book value of equity (CEQ) as of the beginning of the event year.
P	Stock price at the end of the first quarter after the fiscal year *t*.
r	The discount rate computed using the CAPM model as of the pricing date.
PB	The price-to-book ratio of equity as of the pricing date.
BV	Book value of equity as of the end of the fiscal year *t*, scaled by the number of outstanding shares (CEQ ÷ CSHO).
PVAX	Present value of the ex-post residual earnings in the fiscal year *t*+1 ($(EPS_{t+1} - r \times BV_t) \div (1+r)$).
PVTV	Present value of the firm's estimated long-term value, which is the sum of (1) the present value of the residual incomes during years *t*+2 through *t*+4 [$\sum(EPS_{t+i} - r \times BV_{t+i-1}) \div (1+r)^i$, $i = 2,3,4$] and (2) the present value of the terminal value at the end of year *t*+4 [$(PB \times BV_{t+4} - BV_{t+4}) \div (1+r)^4$].
EVENT	An indicator variable equal to one for firms that involuntarily increase their financial reporting frequencies, and equal to zero for matched control firms.
POST	An indicator variable equal to one for the two years after the event year and equal to zero for the two years before the event year.
CHPPE	Change in net fixed assets (PPENT) from the pre-event period (i.e., year *t*-2 through *t*-1) to the post-event period (i.e., year *t*+1 through *t*+2), scaled by beginning of year total assets (AT).
EBITDA	Operating income before depreciation and amortization (EBITDA) scaled by total assets (AT).
INVESTOPP	Decile rank of the firm's Tobin's q: (AT + CSHO×PRCC_F – CEQ) ÷ AT.
LEVERAGE	Book value of long term debt (DLTT + DLC) scaled by total assets (AT).
CASH	Cash (CHE) scaled by total assets (AT).

Table 1
Descriptive Statistics

Panel A: Descriptive statistics of the event firms and matched control firms as of the beginning of the event year

	Event firms (N = 196 Firms)		**Control firms (N = 196 Firms)**		**Difference**			
Variable	Mean	Median	Mean	Median	Mean	t-test p-value	Median	Wilcoxon p-value
SIZE	3.156	2.975	3.194	3.037	0.038	(0.72)	0.062	(0.96)
MB	3.101	2.021	3.241	2.325	0.140	(0.54)	0.304	(0.73)
ROA	0.086	0.068	0.083	0.073	-0.003	(0.64)	0.005	(0.74)

Panel B: Descriptive statistics of the main sample (N=1,514 firm-years)

Variable	Mean	Std Dev	25th Pctl	Median	75th Pctl
BVC	0.641	0.485	0.274	0.508	0.900
AXC	0.000	0.083	-0.018	0.013	0.035
TVC	0.422	0.766	0.040	0.374	0.693
SIZE	3.187	1.263	2.260	3.014	4.003
MB	2.535	2.488	1.036	1.788	3.017
ROA	0.078	0.079	0.035	0.068	0.114

Panel A provides descriptive statistics for the variables used in the propensity score matching procedure, measured at the beginning of the event year.

Panel B provides descriptive statistics for the main sample of 1,514 firm-years over 1952 through 1974. BVC (book value per share divided by stock price), AXC (present value of forecasted abnormal earnings over next year divided by stock price) and TVC (present value of one-year-ahead terminal value divided by stock price) are measured as in Bushee (2001). See Appendix A for remaining variable definitions.

Table 2
Change in the pricing of short-term and long-term earnings around the increase in reporting frequency

Panel A: Base model regression of price on short-term and long-term earnings

Equation 4: $P_t = a_0 + a_1 BV_t + a_2 PVAX_t + a_3 PVTV_t + \eta_t$

(1) Variable	(2) Coefficient	(3) p-value (= 0)	(4) p-value (= 1)
a_1 *BV*	1.015	0.000	0.634
a_2 *PVAX*	2.258	0.000	0.009
a_3 *PVTV*	0.756	0.000	0.000
N	1,514		
Adjusted R^2	0.67		
Year Fixed Effects	Included		

Panel B: Change in the pricing of short-term and long-term earnings around the increase in reporting frequency

Equation 5: $P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + \gamma_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t$

(1) Variable	(2) Coefficient	(3) p-value (= 0)	(4) p-value (= 1)
γ_1 *BV*	1.078	0.000	0.214
γ_2 *PVAX*	1.315	0.149	0.772
γ_3 *PVTV*	0.945	0.000	0.184
γ_4 *EVENT*	0.542	0.677	0.962
γ_5 *BV×EVENT*	-0.119	0.138	0.388
γ_6 *PVAX×EVENT*	**3.591**	**0.001**	**0.000**
γ_7 *PVTV×EVENT*	**-0.485**	**0.000**	**0.000**
γ_8 *POST*	0.622	0.702	0.867
γ_9 *BV×POST*	-0.012	0.894	0.756
γ_{10} *PVAX×POST*	-0.317	0.758	0.841
γ_{11} *PVTV×POST*	-0.008	0.955	0.178
γ_{12} *EVENT×POST*	1.498	0.446	0.104
γ_{13} *BV×EVENT×POST*	0.031	0.796	0.405
γ_{14} *PVAX×EVENT×POST*	**-3.451**	**0.009**	**0.791**
γ_{15} *PVTV×EVENT×POST*	**0.316**	**0.047**	**0.477**
N	1,514		
Adjusted R^2	0.70		
Year Fixed Effects	Included		

Panel A reports the baseline results of the pricing model (Equation 4).

Panel B reports our main results of estimating Equation 5. P-values are two-tailed and based on standard errors clustered by year and industry. “P-value (=0)” represents the p-value that tests whether the coefficient is significantly different from zero. “P-value (=1)” represents the p-value that tests whether the coefficient is significantly different from one. For interaction variables, this test is whether the sum of the interacted and uninteracted coefficients is different from one. Variables are defined in Appendix A.

Table 3
Falsification Test: Change in the pricing of short-term and long-term earnings around a pseudo-event year

Equation 5: $P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + \gamma_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t$

Panel A: Setting the pseudo-event year as two years prior to the actual event year

Variable	Coefficient	p-value (= 0)	p-value (= 1)
γ_1 *BV*	1.228	0.000	0.001
γ_2 *PVAX*	0.091	0.936	0.420
γ_3 *PVTV*	1.088	0.000	0.623
γ_4 *EVENT*	2.373	0.027	0.201
γ_5 *BV*×*EVENT*	-0.279	0.000	0.306
γ_6 *PVAX*×*EVENT*	**2.820**	**0.020**	**0.016**
γ_7 *PVTV*×*EVENT*	**-0.391**	**0.055**	**0.004**
γ_8 *POST*	-0.267	0.868	0.429
γ_9 *BV*×*POST*	-0.034	0.680	0.002
γ_{10} *PVAX*×*POST*	-0.122	0.935	0.313
γ_{11} *PVTV*×*POST*	0.112	0.606	0.113
γ_{12} *EVENT*×*POST*	-0.051	0.981	0.496
γ_{13} *BV*×*EVENT*×*POST*	0.101	0.439	0.805
γ_{14} *PVAX*×*EVENT*×*POST*	**0.789**	**0.638**	**0.002**
γ_{15} *PVTV*×*EVENT*×*POST*	**-0.098**	**0.703**	**0.005**
N	1,204		
Adjusted R^2	0.75		
Year Fixed Effects	Included		

Panel B: Setting the pseudo-event year as two years after the actual event year

Variable	Coefficient	p-value (= 0)	p-value (= 1)
γ_1 *BV*	1.134	0.000	0.077
γ_2 *PVAX*	0.075	0.918	0.235
γ_3 *PVTV*	1.152	0.000	0.188
γ_4 *EVENT*	1.868	0.272	0.539
γ_5 *BV*×*EVENT*	-0.100	0.311	0.543
γ_6 *PVAX*×*EVENT*	**0.938**	**0.423**	**0.845**
γ_7 *PVTV*×*EVENT*	**-0.239**	**0.116**	**0.355**
γ_8 *POST*	0.681	0.532	0.958
γ_9 *BV*×*POST*	0.001	0.990	0.210
γ_{10} *PVAX*×*POST*	0.179	0.872	0.380
γ_{11} *PVTV*×*POST*	0.020	0.867	0.153
γ_{12} *EVENT*×*POST*	-0.823	0.624	0.453
γ_{13} *BV*×*EVENT*×*POST*	0.010	0.935	0.323

γ_{14} *PVAX×EVENT×POST*	**-0.834**	**0.594**	**0.161**
γ_{15} *PVTV×EVENT×POST*	**0.164**	**0.360**	**0.269**
N	1,498		
Adjusted R^2	0.79		
Year Fixed Effects	Included		

This table reports the falsification test results of estimating the extended pricing model (Equation 5) around a pseudo-event year, which is exactly two years before (Panel A) and after (Panel B) each firm's actual mandated frequency change year. P-values are two-tailed and based on standard errors clustered by year and industry. "P-value (=0)" represents the p-value that tests whether the coefficient is significantly different from zero. "P-value (=1)" represents the p-value that tests whether the coefficient is significantly different from one. For interaction variables, this test is whether the sum of the interacted and uninteracted coefficient is different from one. Variables are defined in Appendix A.

Table 4
Change in future ERC around the increase in reporting frequency

Equation 6: $R_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t3} + \beta_4 R_{t3} + \varepsilon_t$

Equation 7: $R_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t3} + \beta_4 R_{t3} + (\beta_5 + \beta_6 X_{t-1} + \beta_7 X_t + \beta_8 X_{t3} + \beta_9 R_{t3}) \times EVENT + (\beta_{10} + \beta_{11} X_{t-1} + \beta_{12} X_t + \beta_{13} X_{t3} + \beta_{14} R_{t3}) \times POST + (\beta_{15} + \beta_{16} X_{t-1} + \beta_{17} X_t + \beta_{18} X_{t3} + \beta_{19} R_{t3}) \times EVENT \times POST + e_t$

Variable	(1) Base Model (Equation 6) Coefficient (*p-value*)		(2) Extended Model (Equation 7) Coefficient (*p-value*)	
$\beta_1 X_{t-1}$	-1.318	***	-1.358	**
	(*0.000*)		(*0.016*)	
$\beta_2 X_t$	1.358	***	0.908	**
	(*0.000*)		(*0.047*)	
$\beta_3 X_{t3}$	0.373	***	0.575	***
	(*0.000*)		(*0.000*)	
$\beta_4 R_{t3}$	-0.145	***	-0.193	***
	(*0.000*)		(*0.000*)	
$\beta_5 EVENT$			0.101	*
			(*0.066*)	
$\beta_6 X_{t-1} \times EVENT$			0.725	
			(*0.388*)	
$\beta_7 X_t \times EVENT$			-0.394	
			(*0.561*)	
$\beta_8 X_{t3} \times EVENT$			**-0.503**	****
			(*0.001*)	
$\beta_9 R_{t3} \times EVENT$			0.132	**
			(*0.018*)	
$\beta_{10} POST$			-0.091	*
			(*0.075*)	
$\beta_{11} X_{t-1} \times POST$			0.583	
			(*0.501*)	
$\beta_{12} X_t \times POST$			0.998	
			(*0.135*)	
$\beta_{13} X_{t3} \times POST$			-0.213	
			(*0.215*)	
$\beta_{14} R_{t3} \times POST$			0.023	
			(*0.707*)	
$\beta_{15} EVENT \times POST$			-0.034	
			(*0.655*)	
$\beta_{16} X_{t-1} \times EVENT \times POST$			-1.986	*
			(*0.063*)	
$\beta_{17} X_t \times EVENT \times POST$			0.467	
			(*0.606*)	

β_{18} X_{t3}×EVENT×POST		**0.465** **
		(*0.047*)
β_{19} R_{t3}×*EVENT*×*POST*		-0.095
		(*0.197*)
N	1,343	1,343
Adjusted R^2	0.38	0.40
Year Fixed Effects	Included	Included

This table reports the results of the future ERC tests with the base model (Equation 6, column 1) and the extended model (Equation 7, column 2). The dependent variable (R_t) is the cumulative return over one year beginning in the end of the third month of the current fiscal year. X_{t-1} is income before extraordinary items in fiscal year *t-1*, scaled by market value of equity as of the beginning of the year. X_t is income before extraordinary items in fiscal year *t*, scaled by market value of equity as of the beginning of the year. X_{t3} is the sum of income before extraordinary items in fiscal years *t+1* through *t+3*, scaled by market value of equity as of the beginning of the year. R_{t3} is the sum of the cumulative returns during fiscal years *t+1* through *t+3*, beginning in the third month of the fiscal year *t+1*. *EVENT* and *POST* are as defined in Appendix A.

P-values are reported below each coefficient estimate and are based on standard errors clustered by year and industry. ***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively.

Table 5
Pricing test conditional on an increase in short-term guidance

Panel A: Univariate differences in guidance issuance by event and control firms from the pre-event and post-event periods

	Pre-Event (N = 196 firms)	Post-Event (N = 196 firms)	Difference	P-value
Average number of short-term forecasts issued per year:				
Event firms	0.217	0.340	0.123	0.01
Control firms	0.306	0.349	0.043	0.35
Percentage of firms issuing short-term forecast:				
Event firms	0.230	0.367	0.137	<0.001
Control firms	0.321	0.372	0.051	0.23

Panel B: Change in the pricing of short-term and long-term earnings around the increase in reporting frequency for firms that did not increase versus firms that increased short-term management forecasts

Equation 5: $P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + \gamma_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t$

	(1) Firms that did not increase short-term forecasts		(2) Firms that increased short-term forecasts	
Variable	Coefficient *(p-value)*		Coefficient *(p-value)*	
γ_1 *BV*	0.994	***	1.425	***
	(0.000)		*(0.000)*	
γ_2 *PVAX*	-0.714		3.250	
	(0.411)		*(0.125)*	
γ_3 *PVTV*	0.938	***	1.002	***
	(0.000)		*(0.000)*	
γ_4 *EVENT*	-0.104		1.543	
	(0.935)		*(0.638)*	
γ_5 *BV×EVENT*	-0.050		-0.421	*
	(0.503)		*(0.051)*	
γ_6 *PVAX×EVENT*	**4.946**	***	**0.663**	
	(0.000)		***(0.801)***	
γ_7 *PVTV×EVENT*	**-0.432**	***	**-0.490**	**
	(0.004)		***(0.012)***	
γ_8 *POST*	-0.135		-0.125	
	(0.933)		*(0.969)*	
γ_9 *BV×POST*	0.041		-0.166	
	(0.669)		*(0.500)*	
γ_{10} *PVAX×POST*	1.107		-0.897	
	(0.302)		*(0.724)*	

γ_{11} *PVTV×POST*	-0.078		0.064	
	(0.566)		*(0.793)*	
γ_{12} *EVENT×POST*	1.326		1.142	
	(0.494)		*(0.761)*	
γ_{13} *BV×EVENT×POST*	-0.030		0.308	
	(0.806)		*(0.244)*	
γ_{14} PVAX×EVENT×POST	**-4.548**	***	**-2.177**	
	(0.003)		***(0.498)***	
γ_{15} PVTV×EVENT×POST	**0.351**	**	**0.266**	
	(0.042)		***(0.327)***	
N	1,056		458	
Adjusted R^2	0.68		0.71	
Year Fixed Effects	Included		Included	

Panel C: Change in fixed asset investment around the increase in reporting frequency for firms that did not increase versus firms that increased short-term management forecasts

Equation 8: $CHPPE_t = \gamma_0 + \gamma_1 EVENT + \gamma_2 POST + \gamma_3 EVENT \times POST + \gamma_4 EBITDA_t + \gamma_5 INVESTOPP_t + \gamma_6 LEVERAGE_t + \gamma_7 CASH_t + \gamma_8 SIZE + \sum INDUSTRY + \sum YEAR\text{-}STATE + \varepsilon_t$

Dependent Variable = Changes in Fixed Assets (*CHPPE*)

	(1) Firms that did not increase short-term forecasts		**(2)** Firms that increased short-term forecasts	
	Coefficient *(p-value)*	Coefficient *(p-value)*	Coefficient *(p-value)*	Coefficient *(p-value)*
γ_1 *EVENT*	0.018	0.019	0.025	0.012
	(0.128)	*(0.136)*	*(0.124)*	*(0.520)*
γ_2 *POST*	-0.004	-0.004	-0.019	-0.008
	(0.671)	*(0.626)*	*(0.212)*	*(0.542)*
γ_3 EVENT×POST	**-0.015**	**-0.019**	**-0.045** *	**-0.048** **
	(0.340)	***(0.203)***	***(0.060)***	***(0.037)***
γ_4 *EBITDA*		-0.158 *		0.111
		(0.058)		*(0.520)*
γ_5 *INVESTOPP*		0.038 ***		0.010
		(0.004)		*(0.639)*
γ_6 *LEVERAGE*		-0.141 ***		-0.178 **
		(0.001)		*(0.018)*
γ_7 *CASH*		0.004		0.047
		(0.951)		*(0.689)*
γ_8 *SIZE*		0.009 **		-0.002
		(0.043)		*(0.806)*
N	1,056	1,056	464	464
Adjusted R^2	0.05	0.07	0.13	0.17

Industry, State, and Year Fixed Effects	Included	Included	Included	Included

Panel A reports management guidance behavior before the increase in reporting frequency (pre-event) and after the increase in reporting frequency (post-event) and tests for significance in the differences across the pre-event and post-event periods.

Panel B reports the results of the pricing tests (Equation 5) separately for firms that did not increase versus firms that increased short-term management forecasts around the frequency increase event. A firm is classified as having increased short-term guidance if the firm provides more short-term (i.e., forecasting horizon up to one year) management forecasts in the post-event period than in the pre-event period, relative to the changes in short-term management forecast issuance by its matched control firm. Unless the event firm provides a short-term management forecast in the post-event period, it is not included in the group of firms that increased short-term forecasts.

Panel C reports the results of the investment tests (e.g., Kraft et al. 2017) separately for firms that increased and firms that did not increase short-term guidance around the frequency increase event. The dependent variable (*CHPPE*) is the change in net fixed assets scaled by beginning of year assets. *EBITDA* is operating income before depreciation and amortization scaled by total assets. *INVESTOPP* is the decile rank of the firm's Tobin's q. *LEVERAGE* is the book value of long term debt scaled by total assets. *CASH* is cash scaled by total assets. *SIZE* is the log value of total assets.

P-values are reported below each coefficient estimate and are based on standard errors clustered by year and industry. ***, **, * indicate significance at the one percent, five percent, and ten percent levels, respectively. Variables are defined in Appendix A.

Table 6
Changes in the pricing of short-term and long-term earnings around the increase in reporting frequency after matching firms on industry

Equation 5: $P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + \gamma_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t$

Variable	Coefficient	p-value (= 0)	p-value (= 1)
γ_1 *BV*	1.075	0.000	0.269
γ_2 *PVAX*	-0.383	0.723	0.202
γ_3 *PVTV*	1.066	0.000	0.603
γ_4 *EVENT*	0.537	0.713	0.751
γ_5 *BV*×*EVENT*	-0.076	0.330	0.988
γ_6 *PVAX*×*EVENT*	**4.577**	**0.001**	**0.000**
γ_7 *PVTV*×*EVENT*	**-0.410**	**0.009**	**0.000**
γ_8 *POST*	1.915	0.335	0.645
γ_9 *BV*×*POST*	-0.006	0.957	0.485
γ_{10} *PVAX*×*POST*	1.396	0.179	0.985
γ_{11} *PVTV*×*POST*	-0.089	0.417	0.790
γ_{12} *EVENT*×*POST*	0.168	0.924	0.421
γ_{13} *BV*×*EVENT*×*POST*	-0.018	0.888	0.758
γ_{14} *PVAX*×*EVENT*×*POST*	**-4.593**	**0.007**	**0.998**
γ_{15} *PVTV*×*EVENT*×*POST*	**0.283**	**0.077**	**0.200**
N	1,279		
Adjusted R^2	0.78		
Year Fixed Effects	Included		

Table 6 reports our main results of estimating Equation 5 after matching event firms to control firms based on industry as an additional requirement in the propensity score matching process. P-values are two-tailed and based on standard errors clustered by year and industry. "P-value (=0)" represents the p-value that tests whether the coefficient is significantly different from zero. "P-value (=1)" represents the p-value that tests whether the coefficient is significantly different from one. For interaction variables, this test is whether the sum of the interacted and uninteracted coefficients is different from one. Variables are defined in Appendix A.

Table 7
Changes in the pricing of short-term and long-term earnings around the increase in reporting frequency for firms that switched from semi-annual to quarterly reporting

Equation 5: $P_t = \gamma_0 + \gamma_1 BV_t + \gamma_2 PVAX_t + \gamma_3 PVTV_t + (\gamma_4 + \gamma_5 BV_t + \gamma_6 PVAX_t + \gamma_7 PVTV_t) \times EVENT + (\gamma_8 + \gamma_9 BV_t + \gamma_{10} PVAX_t + \gamma_{11} PVTV_t) \times POST + (\gamma_{12} + \gamma_{13} BV_t + \gamma_{14} PVAX_t + \gamma_{15} PVTV_t) \times EVENT \times POST + YEARDUM + \varepsilon_t$

Variable	Coefficient	p-value (= 0)	p-value (= 1)
γ_1 *BV*	1.136	0.000	0.038
γ_2 *PVAX*	1.045	0.313	0.966
γ_3 *PVTV*	0.919	0.000	0.506
γ_4 *EVENT*	-0.539	0.734	0.332
γ_5 *BV*×*EVENT*	-0.095	0.318	0.558
γ_6 *PVAX*×*EVENT*	**3.548**	**0.007**	**0.000**
γ_7 *PVTV*×*EVENT*	**-0.412**	**0.006**	**0.000**
γ_8 *POST*	0.385	0.823	0.720
γ_9 *BV*×*POST*	-0.106	0.363	0.754
γ_{10} *PVAX*×*POST*	-0.413	0.737	0.621
γ_{11} *PVTV*×*POST*	-0.014	0.930	0.406
γ_{12} *EVENT*×*POST*	0.899	0.697	0.857
γ_{13} *BV*×*EVENT*×*POST*	0.097	0.562	0.671
γ_{14} *PVAX*×*EVENT*×*POST*	**-3.265**	**0.039**	**0.923**
γ_{15} *PVTV*×*EVENT*×*POST*	**0.320**	**0.080**	**0.001**
N	1,350		
Adjusted R^2	0.63		
Year Fixed Effects	Included		

This table reports our main results of estimating Equation 5 only on the sample of firms that switched from semi-annual to quarterly reporting. P-values are two-tailed and based on standard errors clustered by year and industry. "P-value (=0)" represents the p-value that tests whether the coefficient is significantly different from zero. "P-value (=1)" represents the p-value that tests whether the coefficient is significantly different from one. For interaction variables, this test is whether the sum of the interacted and uninteracted coefficients is different from one. Variables are defined in Appendix A.