Insider trading and voluntary nonfinancial disclosures

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Abstract: Voluntary nonfinancial disclosure of product and business expansion plans occurs frequently in practice and is an important vehicle by which managers convey corporate information to outsiders, but little is known about how managerial opportunistic incentives affect the choice of such nonfinancial disclosures. This study examines whether managers strategically time, and make selectivity in, their voluntary nonfinancial disclosures for self-serving trading incentives. I find strong and robust evidence that managers manipulate the timing and selectivity of their nonfinancial disclosures to maximize trading profits. Specifically, managers tend to disclose bad (good) news on product or business expansion information before purchasing (selling) shares. My results contribute to understanding managers' use of nonfinancial disclosure strategies for fulfilling personal trading incentives, and should be of interest to boards of directors, which monitor and restrict opportunistic disclosures and insider trading within a firm.

1 Introduction

This study investigates whether and how insider trading provides managers with incentives to make strategic disclosures of product and business expansion (hereafters, PBE) plans to the public. Product information disclosures are defined as disclosures of plans that relate to the introduction, change, improvement, or discontinuation of a company's products or services. Business expansion plan disclosures relate to an increase in current operations through internal growth, such as entering into new markets with existing products, opening a new branch, establishing a new division, increasing production capacity, or investing additional capital in the current operations, but exclusive of growth by merger and acquisition.[1] Such nonfinancial disclosures are voluntarily made by firms through press releases or news outlets.

Managers can selectively release good (bad) news, and withhold bad (good) news, on PBE information to inflate (deflate) stock prices at the points when self-serving opportunities arise.[2] Such strategic disclosures are hard to be detected by outsiders, because it is often too difficult to discern whether at a particular point in time, insiders are not informed of any news or are deliberately withholding news (Dye, 1985; Jung and Kwon, 1988). Theories and evidence (e.g., Dye, 1985; Jung and Kwon, 1988; Verrecchia, 2001; Kothari et al., 2009) suggest that withholding information entails substantively lower detection risk and lower litigation risk, compared to disclosing misleading or biased information, and thus is more

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[1] The definitions of the product and business expansion disclosures follow Capital IQ, a division of Standard and Poor's. Appendix II gives four examples of firms' product and business expansion plans. An announcement of product or business expansion plan may imply for not only good news but also bad news on future payoffs to investors due to potential risk associated with changes in products and with business expansion. Such risk might stem from (i) compliance threats originated in relevant polities, laws, regulations, or corporate governance, (ii) financial threats accredited to volatility in the financial market and real economy, (iii) strategic threats related to customers, competitors, and investors, (iv) operational threats that concern the processes, systems, people, and overall value chain of a business, and (v) uncertainty as to managerial ability to execute a firm's product or business expansion strategies.

[2] Managers can opt not to disclose corporate news fully to the public. When disclosing corporate news, managers might withhold some bad (good) news they know. In such a selective-disclosure case, stock prices are very likely to be inflated (deflated), because, as to be mentioned in the main body text, it is too hard for outside investors to see through the news hoarding, which is more so for the hoarding of PBE news that is qualitative in nature.

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prevalent among listed companies for fulfilling various opportunistic incentives; this underscores the importance of empirically investigating this issue. Management earnings forecast pertains to an aggregate number that in itself bears good news, or bad news, only. In contrast, PBE plans may contain rich, heterogenous information involving both good news and bad news. Therefore, voluntary nonfinancial disclosures of PBE plans provide a more powerful setting to examine directly the managerial selective-disclosure and news-hoarding behavior than do management earnings forecasts. This constitutes the first motivation of my study.

Second, and more importantly, the existing literature on the role of managerial incentives in voluntary disclosures focuses predominantly on management earnings forecasts (e.g., Bushman and Indjejikian, 1995; Frankel et al., 1995; Noe, 1999; Aboody and Kasznik, 2000; Lang and Lundholm, 2000; Negar et al., 2003; Cheng and Lo, 2006; Brockman et al., 2008; Rogers, 2008; Cheng et al., 2013; Baginski et al., 2017), with little regard to voluntary nonfinancial disclosures. Moreover, this disclosure literature focuses on the litigation costs associated with managerial opportunism, with few concerns about reputation costs. Thus, despite of the findings of this literature, it is unclear, and hence an open question, whether managers tend to strategically disclose PBE plans before stock trades to grab more trading gain, when taking into account the reputation costs as well as the differences between management earnings forecasts and PBE disclosures. There are three main differences in terms of the role they play as an instrument for managers to fulfil opportunistic incentives.

First, unlike management earnings forecasts that could be verified by subsequent audited earnings reports, a qualitative PBE disclosure, especially in terms of its disclosure completeness and timeliness, is hard to verify at least in a short run. Therefore, managers can manipulate the timing and selectivity of PBE disclosures to exploit self-serving opportunities with relatively low detection risk.

Second, compared to management earnings forecasts that relate mainly to the short-term prospects of a firm's performance, PBE disclosures have implications for long-term streams of a firm's future earnings. As evidenced by Nichols (2010), stock markets react strongly to PBE disclosures.

Third, PBE disclosures are more discretionary in nature and can be more flexibly used by managers for opportunistic purposes. Compared with a management forecast of earnings, a qualitative PBE disclosure concerns a much richer, more specific information set, from which managers may have selection for strategically releasing good news *vis-à-vis* bad news to influence stock prices. Moreover, firms tend to commit to a long-standing policy of providing continual earnings forecasts or of non-earnings-forecast (e.g., Graham et al., 2004; Field et al., 2005). A discontinuity of earnings forecasts would subject firms to reputational losses and increased cost of capital (Chen et al., 2011). By contrast, disclosures of PBE news are often not scheduled and may occur sporadically throughout the years.

In addition, voluntary disclosure of PBE plans occurs frequently in practice and is an important channel through which managers convey value-relevant information to outsiders, but little is known about how managerial opportunistic incentives shape the choice of such nonfinancial disclosures. For all the above reasons, PBE disclosures are well suited for this study, which aims to examine whether and how insider trades create incentives for managers to take advantage of disclosures to manipulate information flows.

Insider trading regulations strictly prohibit any insider trade made before disclosures of material nonpublic information (e.g., Garfinkel, 1997; Noe, 1999). Hence, following prior research (e.g., Cheng and Lo, 2006; Rogers, 2008; Cheng et al., 2013), I use insider trading after corporate disclosures to proxy for managers' ex ante incentives to seek trading profits. To increase trading gain, managers can selectively provide good (bad) news disclosures to inflate (deflate) stock prices before selling (purchasing) shares. But managers might incur

trading costs for doing so, and the trading costs vary. In the case of insider purchases, the related stock price increase would only result in opportunity costs, which are not regarded as damaging to an investor (Niehaus and Roth, 1999). Hence, presumably insider purchases after disclosures would not lead to litigation to insiders.

In this paper, I define disclosure risk broadly as including both reputation risk and litigation risk that are associated with strategic disclosures.[3] While selectively releasing bad news and hiding good news before stock purchases, managers may defend themselves away from potential litigation and/or reputation losses by claiming that they are ignorant of good news at the time of the bad news disclosures. In such a case, managers would bear not only low trading risk from insider purchases but also low disclosure risk from nonfinancial disclosures[4]; it is therefore more likely that managers selectively make bad news disclosures on PBE information before purchasing shares.

However, to the extent that bad news hoarding is more subject to queries and criticisms than good news hoarding, it would be relatively less easier for insiders to defend themselves against litigation and reputation risks by claiming that they are unaware of bad news at the time of the good news disclosures made before stock sales. Furthermore, unlike insider purchases, insider sales could lead to high litigation costs for insiders. To be specific, if insiders sell shares after a good news disclosure, a resultant stock price decline would constitute a real damage to the wealth of incumbent shareholders who fail to trade duly. As a result, shareholders who suffer losses could institute a suit against insiders, alleging that the insiders traded on foreknowledge of price-relevant corporate disclosures and therein

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[3] Disclosure risk, in narrow term, refers to the litigation risk arising from disclosures proven to be incredible and opportunistic ex post (e.g., Cheng and Lo, 2006; Choi et al., 2010). In a broad sense, disclosure risk may also encompass reputation risk, that is, the risk of reputational losses which would lead to economic costs associated with a firm's future operations.

[4] Consistent with prior research (e.g., Cheng and Lo, 2006), trading risk in this paper is defined as the litigation risk arising from insider trades that are alleged to have occurred in contravention of insider trading regulations. On the surface, the insider trading rules that prohibit trading on material nonpublic information apply equally to insider sales and insider purchases, but as discussed in the main body text of the paper, insider sales are generally associated with higher expected legal costs than are insider purchases.

contravened the "disclose or abstain" trading rule (Cheng and Lo, 2006; Huddart et al., 2007). Hence, insiders would still bear litigation risk for selling shares after disclosures. Therefore, insiders would (would not) selectively disclose good news on PBE information prior to selling shares, if the costs associated with the strategic behavior are perceived by insiders to be lower (higher) than the expected trading gain.

The empirical tests are conducted based on a sample of 10,162 PBE disclosures made in the 2002-2012 period. Using an ordinary logit regression, I find that the likelihood of a bad-news PBE disclosure, relative to that of a good-news PBE disclosure, is significantly higher before insider purchases. This is consistent with the view that a bad-news nonfinancial disclosure being made before insider purchases entails low trading risk and low disclosure risk for insiders. I also find that managers tend to disclose good PBE news before insider sales, which suggests that the trading benefits are perceived by insiders to outstrip the expected litigation costs associated with insider sales. This is not surprising, because it is likely that the litigation risk for insider sales does not manifest itself in a good-news nonfinancial disclosure, which is of low disclosure risk to insiders.

There are two main sources of potential endogeneity between disclosures and trading in my research context. First, there might be some unobservable firm characteristics that drive both insider trading decisions and voluntary PBE disclosures. Second, insider sales (purchases) may be simply a passive response to the increased (decreased) stock price that follows a good (bad) news PBE disclosure. To tackle the first type of endogeneity, I use two approaches: (1) a firm-fixed-effects model; (2) a reduced-form difference-in-differences regression in which the treatment variable is change in insider trades around PBE disclosures. I obtain similar inferences using both approaches. To address the second type of endogeneity, I follow Cheng and Lo (2006) to perform a two-stage-least-squares estimation procedure, and again obtain consistent evidence that opportunistic PBE disclosures are made in a way that

increases trading profits for insiders. In teasing out the alternative explanation regarding the passive response to disclosure news and to stock prices, I also conduct a falsification test. Specifically, I account for insider trades made by non-officer employees, who are unlikely to influence major corporate decisions. If it is the trading incentives that drive the disclosure decisions, I should find no results for trades made by the non-officer employees. If it is the alternative explanation that drives the main results, I should find similar results for trades by the non-officer employees. The results for the falsification test are in line with the former, suggesting that my inferences are not attributed to the reverse causality.

Furthermore, provided that unobservable factors simultaneously drive insider trades and PBE disclosures, insider sales (purchases) should have followed a bad (good) news PBE disclosure, which goes opposite to, and thus would not alternatively explain, my hypotheses and findings. Reverse causality is arguably not an issue either. A large body of literature (e.g., Chen et al., 2007; Bakke and Whited, 2010; Dutta and Reichelstein, 2003; 2005; Foucault and Fresard, 2012, 2014; Loureiro and Taboada, 2015; Zuo, 2016) provides evidence that managers account for information in stock prices and actively incorporate it into their investment and disclosure decisions. Since managers care about and keep learning from stock prices, they should have a sense of how their PBE disclosures might impact stock prices. As such, insider trades that occur shortly after disclosures are unlikely to be attributed to managers' passive response to their own disclosure choices. All in all, both the robustness analyses and conceptual arguments refute the possibility that my main results are driven by endogeneity.

To enrich my analyses and to further ensure the robustness of my results, I conduct three additional tests. First, I investigate whether managers tend to sell (buy) shares before a bad (good) news disclosure of PBE information. Consistent with the fact that insider trading ahead of corporate disclosures carries a far more significant legal risk than insider trades after

disclosures, I find no evidence that insiders tend to trade shares prior to a PBE disclosure. Second, I find evidence that my main test results are not driven by self-selection of managerial decisions to voluntarily disclose PBE plans. Third, I find that the main test results are robust to addressing the confounding effects that arise from PBE disclosures being bundled with contemporaneous earnings announcements/management earnings forecasts.

This study contributes to the literature in several ways. Firstly, prior disclosure research investigates the impact of managerial incentives on voluntary financial disclosures in the setting of equity offerings (Frankel et al., 1995; Marquardt and Wiedman, 1998; Lang and Lundholm, 2000; Kim, 2016), stock repurchases (Brockman et al., 2008), stock and stock option grants (Aboody and Kasznik, 2000; Nagar et al., 2003), leveraged buyout offers (Hafzalla, 2009), stock-for-stock mergers (Ge and Lennox, 2011), and insider trades (Noe, 1999; Bushman and Indjejikian, 1995; Rogers and Stocken, 2005; Cheng and Lo, 2006; Rogers, 2008; Cheng et al., 2013). However, voluntary nonfinancial disclosures are neglected in this research area. My study contributes to this strand of literature by being the first to provide evidence on how PBE disclosures are shaped by managerial opportunistic incentives.

Secondly, this study is the first to establish the direct link between insider trading and nonfinancial disclosures. While nonfinancial disclosures of PBE plans occur more frequently than management earnings forecasts in practice (Nichols, 2010), little is known about the determinants of these nonfinancial disclosures. This study fills this gap and demonstrates the importance of insider trading incentives in managerial choice of nonfinancial disclosures.

Prior studies (e.g., Cheng and Lo, 2006; Rogers, 2008) find that managers tend to issue bad news earnings forecasts to lower stock prices before purchasing shares. However, they do not find that managers tend to make good news earnings forecasts before selling shares, a result attributed both to high disclosure risk for earnings forecasts and to high trading risk for insider sales. Unlike the prior research, I focus on nonfinancial disclosures that entail low

disclosure risk for insiders, and find strong evidence not only on bad news disclosures made before insider purchases but also on good news disclosures made before insider sales. This implies that managers have a stronger incentive to exploit voluntary disclosure opportunities for personal gain when the disclosure risk is sufficiently low. Thus, this study, in conjunction with the related literature, provides a more complete portrait of managers' use of disclosure strategies for fulfilling personal incentives. Given that informed insider sales would cause real damage to uninformed investors, but informed insider purchases would not (Niehaus and Roth, 1999), my findings should have very important incremental implications for market participants.

Lastly, the Insider Trading and Securities Fraud Enforcement Act of 1988 imposed severe civil penalties on firms who "*failed to establish, maintain, or enforce any policy or procedure*" to curb violations of insider trading laws. Given that firms could also be punished for insider-trading violations by their executives, this study should be of particular interest to boards of directors monitoring and restricting insider trades within a firm.

The remainder of the paper proceeds as follows. Section 2 reviews the related literature and develops the hypotheses. Section 3 describes the data collection and variable measures. Section 4 explains the research methodologies. Section 5 discusses the results. Section 6 conducts the additional tests, and Section 7 concludes.

2 Related literature and hypothesis development

Related prior research as to the role of managerial incentives in voluntary disclosures

Managers have great discretion on whether and how to make voluntary disclosures to the public. A large body of literature investigates how managers exploit their discretion over disclosures for opportunistic purposes. For instance, Lang and Lundholm (2000) provide evidence that firms release more good news for a higher stock price before equity offerings.

Brockman et al. (2008) show that managers tend to release pessimistic earnings forecasts to deflate stock prices before stock repurchases. Ge and Lennox (2011) find that managers withhold bad earnings news before stock-for-stock mergers. Yermack (1997) and Aboody and Kasznik (2000) document that managers strategically disclose bad news to deflate stock prices before option grants to maximize option values. Several studies look at managerial strategic disclosures in the setting of insider trades that exclude option grants. Cheng and Lo (2006) find that managers release more bad earnings news prior to purchasing shares of their firms. In parallel, Rogers (2008) find some, albeit weaker, evidence that managers provide lower quality disclosures prior to purchasing shares than they would in the absence of insider trades. Cheng et al. (2013) find that managers tend to release more precise earnings forecasts for good (bad) news than for bad (good) news before selling (buying) shares. Overall, the evidence in this line of literature indicates that corporate voluntary disclosures, which occur shortly before price-relevant events, are subject to managerial opportunistic incentives. Put differently, it is the opporutnistic incentives for equity offerings, stock repurchases, stock-for-stock mergers, option grants, and insider trades, that drive the disclosure behaviors, rather than that the disclosures cause those events to take place ex post. As such, hypothetically, reverse causality is less concerned in this strategic-disclosure literature; so too is my study which looks at PBE disclosures made before insider trades.

The managerial opportunistic disclosures prior to equity offerings, stock mergers, or stock repurchases are aligned with the interests of incumbent shareholders. But in the insider trading scenario, the opportunistic disclosures are not aligned and are just in the managers' own interests. Hence, managers' opportunistic incentives for disclosures are notably stronger around insider trades, which are widespread, and accordingly, insider trading incentive is the most frequently investigated managerial incentive in the voluntary disclosure literature (Cheng et al., 2013). So, this study focuses on insider trading to examine how managerial

incentives shape voluntary nonfinancial disclosures as to product and business expansion information.

The role of managerial incentives in voluntary PBE disclosures vis-à-vis management earnings forecasts

Prior studies on the role of managerial incentives in voluntary disclosures focus exclusively on management earnings forecasts. While this study makes the first attempt to shed light on the impact of managerial incentives on product and business expansion disclosures, it is important to note how such nonfinancial disclosure may differentiate itself from management earnings forecasts in helping managers fulfil self-serving incentives. There are three major differences.

First and foremost, managerial discretion on management earnings forecasts is subject to ex post discipline from subsequent audited earnings reports. Managers can selectively release good news, or withhold bad news, in their earnings forecasts, and given the issuance of an earnings forecast, managers can issue an optimistically biased forecast. However, outside stakeholders can use the subsequent audited earnings reports as well as information from other resources to assess the credibility of the forecasts (Rogers and Stocken, 2005). Withholding bad news or issuing optimistic forecasts, once discovered, will not only lead to reputational losses for a firm but also expose the firm to high litigation risk (e.g., Skinner, 1994; Skinner, 1997; Field et al., 2005; Hutton, 2007; Donelson et al., 2012). The risk of such litigation is particularly high when insider trading is involved (Cheng et al., 2013), because insider trading regulations prohibit insiders' trading on material nonpublic information.[5] This trading risk, coupled with the high disclosure risk arising from earnings forecasts proven to be incredible ex post, largely constrains managers from withholding bad earnings news or

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[5] "Material" information refers to information that would affect the trading decisions of outside investors.

from issuing optimistic earnings forecasts. Consistent with this notion, Cheng and Lo (2006) find no evidence that managers tend to release good earnings news before insider sales. Rogers and Stocken (2005) find that only in cases when it is difficult for investors to detect earnings forecast bias would managers issue biased forecasts before insider trades.

Even if managers do not withhold bad earnings news or bias their earnings forecasts, they can manipulate the precision of their forecasts in a way that a good news forecast is more precise than a bad news forecast. However, as documented by Choi et al. (2010), high earnings forecast precision is associated with a higher likelihood of earnings forecasts being proven wrong ex post, thereby resulting in high disclosure risk for a firm (i.e., when the actual earnings are likely to fall outside the earnings forecast range). Such disclosure risk also restrains managerial discretion on earning forecast precision. Consistent with this notion, Cheng et al. (2013) find that managers are much less likely to manipulate earnings forecast precision to obtain personal trading gain in the high-risk scenario in which good news precedes insider sales or bad news precedes insider purchases, than in the low risk scenario in which bad news precedes insider sales or good news precedes insider purchases.

Unlike management earnings forecasts, nonfinancial disclosures of PBE plans, especially in respect to disclosure completeness and timeliness, are hard to be verified ex post, or at least in a short run, by outside investors who generally do not have access to a firm's private information. Thus, managers can manipulate the timing and selectivity of PBE disclosures to fulfil personal trading incentives without bearing high disclosure risk. Specifically, managers can selectively release (withhold) good (bad) PBE news to inflate stock prices, or selectively disclose (withhold) bad (good) PBE news to deflate stock prices, at the points at which self-serving opportunities come out. While withholding PBE news at a specific point in time, managers can defend themselves away from litigation and reputation losses by arguing that at that point, they do not get known, or do not know with certainty,

about the news. As such, the potential reputation costs and litigation costs for withholding PBE news would be relatively low for managers, even if the incomplete or untimely PBE disclosures are discerned by outsiders.

Second, management earnings forecasts, mostly made on a short-run horizon, imply mainly the short-term prospects of a firm's earnings performance, whereas investors, especially those having a long horizon over future firm prospects, may not rely only on current earnings news in forming expectations about future earnings. Good (bad) earnings performance in the current period does not necessarily denote that future earnings would be good (bad) as well. In pricing firm equity, investors, if rational and sophisticated, should also rely on nonfinancial information such as product or business expansion to forecast a firm's long-term streams of future sales and earnings. Consistent with this notion, Nichols (2010) finds evidence on significant market reactions to PBE disclosures.

Third, PBE disclosures are relatively more discretionary in the timing and selectivity than are management earnings forecasts. Prior studies (e.g., Bushee et al. 2003; Graham et al., 2004; Field et al., 2005) document that earnings guidance policy tends to be sticky, as firms usually commit either to providing continual earnings forecasts or to non-earnings-forecast. There are high reputation costs for a firm with discontinuing earnings forecasts (Chen et al., 2011). But PBE disclosures may occur sporadically, as opposed to management earnings forecasts that are often scheduled shortly before earnings announcements. More importantly, management earnings forecast pertains to an aggregate number reflecting a firm's projected earnings performance. In contrast, PBE plans involve richer, more specific, heterogenous information, including both good news and bad news, from which managers can make selection to impact stock prices.

On the whole, on top of management earnings forecasts, nonfinancial disclosure of PBE plans is a powerful, flexible, yet very distinct, instrument that managers may use to fulfil

their personal incentives. In the next section, I discuss how insider trading, a managerial incentive most frequently examined by prior research, can impact upon voluntary disclosures of PBE plans.

Hypothesis development --- insider trading incentives and voluntary PBE disclosures

Equity compensation incentive is intended to align managers' interests with those of shareholders, thereby improving firm performance (Jensen and Meckling, 1976). However, there is no prior theoretical or empirical consensus on whether managerial equity ownership affects firm performance. A potential negative consequence of equity incentive is that managers' equity wealth is exposed to idiosyncratic risk of a firm. Unlike shareholders who can hedge the idiosyncratic risk through investment portfolio diversification, managers cannot hedge much of their equity wealth. When the equity risk exposure becomes too high for the managers, they sell the shares they own to diversify the idiosyncratic risk (e.g., Ofek and Yermack, 2000; Cheng and Warfield, 2005). There usually exists an equilibrium point for the managerial equity ownership level, beyond which it becomes no longer optimal for managers to bear the increased equity risk. Quite a few firms adopt "target stock ownership" plans, seeking an optimal stock ownership for CEOs to ensure incentive alignment (Core and Larcker, 2002). When managers' equity incentive levels are lower (higher) than the optimal equilibrium level (a point that may keep changing over time, depending on a firm's external environment and internal business operations as well as on managers' own utility function), the managers would have an intent to purchase (sell) shares from (to) the open stock market. This motivates and induces insider trading in the financial marketplace.

The value of insider trading is tied to stock prices. So, to increase trading gain, managers can exploit their private information and manipulate corporate disclosures to influence stock prices. But insider trading regulations (particularly, the "disclose or abstain"

doctrine) require that insiders who possess material private information should either disclose it to the public or abstain from trading. Any insider trade preceding price-relevant corporate disclosures is regarded as illegal.[6] The enactment of the Insider Trading Sanctions Act (ITSA) of 1984 and the Insider Trading and Securities Fraud Enforcement Act (ITSFEA) of 1988 substantially increased penalties for illegal insider trades.[7] Therefore, when managers plan for trading, they can opt to selectively disclose good (bad) news to inflate (deflate) stock prices before selling (buying) shares. However, insiders who trade after corporate disclosures may still be suspected of having exploited foreknowledge of price-relevant public disclosures (Huddart et al., 2007), which, if confirmed to be true, would violate the U.S. securities laws governing the release of forward-looking statements around insider trades (Arshadi, 1998; Rogers and Stocken, 2005). Hence, insiders still bear some litigation risk for trading after corporate disclosures, though lower than that associated with trading before disclosures. Such litigation risk is mainly manifested in the insider selling case for two reasons.

Firstly, when insider sales are followed by a price decline, investors who fail to trade duly would suffer losses and can thereby file a lawsuit against insiders, alleging that the insiders traded on foreknowledge of public disclosures and therein violated the "disclose or abstain" trading rule (Cheng and Lo, 2006; Huddart et al., 2007). In contrast, a stock price increase following insider purchases only leads to opportunity losses for investors. Because the opportunity costs of not purchasing shares duly are not considered as damages to investors (Niehaus and Roth, 1999), presumably insider purchases after disclosures would not

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[6] Due to the direct legal constraints, managers usually dare not deliberately delay good (bad) news until after stock purchases (sales). Noe (1999) finds evidence of insider trades after management earnings forecasts but no evidence of insider trades before the forecasts are released. Garfinkel (1997) and Huddart et al. (2007) find that insiders tend to trade shares after earnings announcements but not before earnings announcements. Thus, consistent with the disclosure literature (e.g., Rogers and Stocken, 2005; Cheng and Lo, 2006; Rogers, 2008; Cheng et al., 2013), I focus on corporate disclosures ahead of insider trades in my empirical analysis.

[7] ITSA increased civil penalties by 300% and increased criminal penalties by 1,000% relative to pre-existing penalties. ITSFEA increased criminal penalties to a maximum of $1 million and increased the maximum jail sentence to 10 years (Jagolinzer and Roulstone, 2009).

result in litigation to insiders. Secondly, most private enforcers of insider trading rules focus exclusively on insider selling cases, and the courts often recognize insider sales as an action with scienter (Johnson et al., 2004; Rogers, 2008).[8] In contrast, insider purchases, especially after bad news disclosures, could be alternatively construed as insiders' signaling their optimistic beliefs in a firm's future prospect, and thus are not usually recognized as a mechanism for establishing scienter in courts.

The completeness and timeliness of nonfinancial disclosures as to PBE plans are not easily discernable by outside investors, and hence insiders bear low disclosure risk for manipulating the timing and selectivity of such nonfinancial disclosures. Such disclosure risk is even lower for selectively releasing bad news and hiding good news, than for selectively disclosing good news and concealing bad news, at a specific point in time. Given the low trading risk from insider purchases and the low disclosure risk from bad new nonfinancial disclosures, the perceived costs for insiders of purchasing shares after a bad-news nonfinancial disclosure should be lower compared to the perceived benefits of trading gain. Thus, managerial incentives to buy shares are expected to induce a higher incidence of a bad-news PBE disclosure in advance of the share purchases. However, I also allow for the possibility that managers might still scruple about potential reputation losses and litigation that are associated with their opportunistic strategy. Accordingly, I make my first hypothesis in both the null and alternative forms as follows.

H1₀: *The likelihood of a bad news disclosure (relative to that of a good news disclosure) of product or business expansion information before insider purchases does not differ from the likelihood of the bad news disclosure in the absence of insider purchases.*

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[8] Scienter is defined by the U.S. Supreme Court as "*a mental state embracing intent to deceive, manipulate, or defraud.*"

H1$_a$: *The likelihood of a bad news disclosure (relative to that of a good news disclosure) of product or business expansion information before insider purchases is higher than the likelihood of the bad news disclosure in the absence of insider purchases.*

As discussed previously, insiders may still bear high trading risk for selling shares after good news disclosures. In this scenario, if the perceived benefits of trading gain are higher (lower) than the perceived costs associated with the trading risk and with the disclosure risk, insiders would (would not) selectively disclose good news on PBE information before selling shares. Thus, my second hypothesis, stated respectively in the null and alternative forms, follows.

H2$_0$: *The likelihood of a good news disclosure (relative to that of a bad news disclosure) of product or business expansion information prior to insider sales does not differ from the likelihood of the good news disclosure in the absence of insider sales.*

H2$_a$: *The likelihood of a good news disclosure (relative to that of a bad news disclosure) of product or business expansion information prior to insider sales is higher than the likelihood of the good news disclosure in the absence of insider sales.*

3 Data and variable measurements

Sample and data sources

The empirical analysis is conducted based on data gathered primarily from four sources: Compustat, CRSP, Capital IQ, and Thomson Financial. I draw the PBE disclosure data from Capital IQ, which maintains a team of over 600 analysts who collect and code key developments from press releases and news outlets for all U.S. publicly traded firms. Capital IQ has data on a variety of key corporate developments, including corporate earnings guidance, product announcements, and business expansion announcements. Product and business expansion announcements pertain to stand-alone public disclosures, which, in

content, are exclusive of other types of corporate reporting and disclosures; this makes my empirical analysis relatively clean and not systematically subject to the confounding effects of other concurrent information disclosures. The PBE news announcements were all initiated by firms, with each announcement corresponding to a unique announcement date and to unique news content. The availability of the PBE disclosure data from Capital IQ narrows my sample period to 2002-2012. Consistent with Cheng et al. (2013), the sample observations used for the hypothesis tests are restricted to those that have disclosures of PBE plans.

Insider trading data are obtained from Thomson Financial Insider Research Services Historical Files. Consistent with Huddart and Ke (2007), insider trading transactions used in the empirical tests are limited to open market purchases and open market sales. Non-open-market transactions, including option grants, option exercises, dividend reinvestments, stock transfers among family members, and pension transactions, are excluded. I further restrict the insider trading transactions to those by officers and directors only, excluding those by non-officer employees who are unlikely to have an influence on corporate disclosure decisions.[9] To focus on the aggregate influence of the management team, I sum the purchases and sales by all top managers of the same firm in the periods of interest.[10] Finally, I require that sample observations have the necessary data from CRSP, Compustat, Capital IQ, and Thomson Financial to construct the variables of interest for the empirical tests. The final sample ends up with 10,162 disclosure observations for 1,076 unique firms. Table 1 tabulates descriptive statistics of the variables used in the main tests, and Table 2 reports the correlation matrix among those variables.

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[9] My results all hold when I use CEOs' insider trades only or when I use the aggregate insider trades made by CEOs, CFOs, and chairmen of boards.

[10] For a given firm in a period, some insiders may be selling while others may be buying. In this case, insider sales (purchases) will be subtracted from insider purchases (sales) to reflect the net direction of insider purchases (sales) in that period.

Measures of the news content of voluntary PBE disclosures

Following Noe (1999), Cheng and Lo (2006), Brockman et al. (2008), Ge and Lennox (2011), Nichols (2010), among others, I use the stock market reaction to identify whether a disclosure conveys good or bad news to the market. Specifically, a PBE disclosure is classified as a good (bad) news disclosure if the cumulative abnormal returns over the 3-day window centered on the disclosure date are positive (negative).[11] The cumulative abnormal returns are calculated based on the market model with an estimation period of [-181, -2] relative to the PBE disclosure date. In addition, I use an alternative estimation window, [-181, -2] plus [2, 52], to construct the measure for disclosure news, and obtain qualitatively identical results; this specification for the news measure, which accounts for a post-disclosure period for the estimation window, also serves to mitigate the reverse causality problem that is to be covered in Section 4. The principal dependent variable in the empirical analyses is *Gbnews*, which equals 1 if a firm delivers a good news disclosure of PBE information, and equals 0 if a firm makes a bad-news PBE disclosure.[12] The mean value of *Gbnews*, as reported in Table 1, amounts to 51.87%, indicating that more than half of the announcements of PBE plans pertain to good news disclosures. This is consistent with Nichols (2010) who finds that managers are more likely to convey good news in the PBE announcements.

Measures of insider trading incentives

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[11] There are two reasons why my main hypothesis tests are conditioned on firms making a PBE disclosure over a fiscal quarter. First, *a firm may prefer not to disclose its private information if it is uncertain of investor response* (Suijs, 2007, p.391). So by restricting the sample observations to those that have a PBE disclosure, we alleviate the endogeneity concern (to be covered in Section 4) that managers may not foresee exactly the price responses to a disclosure. Second, the announcement returns used to capture the news content of PBE disclosures also encompass the "risk-reducing" effect of a disclosure (i.e., a decrease in information asymmetry due to the incidence of a disclosure). Such "risk-reducing" effect, however, would have been counterbalanced and dis-functioned in the regression analyses, if the regression is run based on the disclosure sample only (He, 2017).

[12] The regression results still hold when the dependent variable is broken into the product-information-disclosure-only case and the business-expansion-disclosure-only case, respectively.

Trading profits motivate managers to strategically change their nonfinancial disclosure policies to generate profit opportunities. As discussed in Section 2, if insiders wish for high trading gain, they should trade shortly after disclosures, whereby the ex post trading intensity reflects the managers' ex ante incentives to grab trading profits. Consistent with prior studies (e.g., Sivakumar and Waymire, 1994; Neo, 1999; Ke et al., 2003; Cheng et al., 2013), I focus on insider trades in the 30-day period after a disclosure, because delayed trading after a disclosure would reduce trading profits for insiders. I obtain qualitatively the same results if I expand the window to be the 90-day period after PBE disclosures. Because the insider trading amount is highly skewed, I use the logarithm transformation of insider trades for the empirical tests.

To separate sale incentives from purchase incentives for a given firm in the periods of interest, I define the insider trading variables as follows. *Insidersell* equals the natural logarithm of one plus net insider sales (i.e., insider sales minus insider purchases) over a 30-day period after a PBE disclosure, should a firm have a positive amount of net insider sales over the 30-day window, and equals 0 otherwise. *Insiderbuy* equals the natural logarithm of one plus net insider purchases (i.e., insider purchases less insider sales) over a 30-day window after a PBE disclosure, if a firm has a positive amount of net insider purchases over the 30-day window, and equals 0 otherwise. As shown in Table 1, the mean value of *Insidersell* is significantly higher than the mean *Insiderbuy*, indicating a higher intensity of insider sales than that of insider purchases after PBE disclosures. The Spearman correlation between *Insidersell* and *Insiderbuy*, reported in Table 2, is 0.0635, indicating no multicollinearity arising should both the sale incentive proxy and the purchase incentive proxy be put in the same regression.

In addition, following Cheng et al. (2013), I use indicator variables to capture the existence of insider trades in the 30-day period after a PBE disclosure. The indicator variable

for insider sales equals 1 if the net insider sale amount is positive (i.e., insider sales are larger than insider purchases) and 0 otherwise. The indicator variable for insider purchases equals 1 if the net insider purchase amount is positive and 0 otherwise. The use of this alternative specification of insider trading does not alter any inference drawn in the main empirical tests.[13]

4 Research design

The theme of the hypothesis tests is to look at how insider trading incentive motivates and shapes nonfinancial disclosure strategies. The causality flow runs from trading motives to disclosures, where the former is empirically proxied by insider trades after PBE disclosures. In the case of no endogeneity problem, an ordinary logit regression model is adequate. However, there might be two main sources of endogeneity in my research context. The first is that both the voluntary disclosures and the trading decisions are simultaneously driven by some unobserved firm characteristics. The second source of potential endogeneity pertains to reverse causality. In particular, more insider sales (purchases) occurring after a good (bad) news PBE disclosure can indicate either one or both of the following: (1) Managers' incentives to sell (buy) shares motivate a good (bad) news disclosure, as hypothesized in $H1_a$ & $H2_a$; (2) When stock price increases (decreases) after a good (bad) news disclosure, managers sell (buy) shares in response to the increased (decreased) stock price. In the latter case, the insider trading can be regarded as a passive response to disclosure choices. As such, reverse causality arises in the way that disclosures induce insider trades. Because strategic PBE disclosures and insider trading are made in conjunction within a short window,

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[13] Using the indicator variables imposes no restrictions on the specific form of the relationship between insider trades and PBE disclosures, thereby increasing the power of the tests. However, the use of the insider trading indicators ignores the effect of the magnitude of insider trades which is presumably proportional to the amount of trading gain and to the strength of insider trading incentives. Hence, I use the continuous variables, *Insidersell* and *Insiderbuy*, in the main tests.

identification of exogenous shocks to conduct a natural experiment will not work in addressing the endogeneity issues in my setting, and thus I seek other approaches. To address the first type of endogeneity, I use a firm-fixed-effects model and a reduced-form difference -in-differences specification. To get around the second type of endogeneity, I follow Cheng and Lo (2006) and Cheng et al. (2013) to employ a two-stage-instrumental-variables regression technique and, additionally, conduct a falsification test. The remainder of this section discusses each of the foregoing approaches, except that the falsification test is covered separately in Section 5.

Baseline regression --- logit regression

Studies on insider trades over narrow windows around corporate disclosures, as compared to long windows, are less subject to the endogeneity ascribed to correlated omitted variables (e.g., Huddart et al., 2007). Furthermore, if disclosures followed by insider trades are driven by the omitted variables, we should have expected a bad (good) news disclosure accompanied by insider sales (purchases), which, however, is opposite to what I predict in $H1_a$ & $H2_a$. Hence, the omitted-variables problem, even if existing, would only create bias in favor of the inferences for $H1_a$ & $H2_a$. Regarding the reverse causality, as argued by Cheng et al. (2013), it would not be serious when disclosure news is measured by abnormal stock returns. What is more, to the extent that managers learn from information in stock prices and incorporate that into their investment and disclosure decision-making (e.g., Chen et al., 2007; Bakke and Whited, 2010; Foucault and Fresard, 2012, 2014; Loureiro and Taboada, 2015; Zuo, 2016), they should have some sense of how PBE disclosures would affect stock prices. On this basis, it is not likely that insider trades occurring shortly after a PBE disclosure is ascribed to managers' passive response to their own disclosure decisions. In the case that

there exists little endegeneity, an ordinary logit model seems adequate, and accordingly, I estimate the following logit regression model for the hypothesis tests.

$$GBnews = \alpha_0 + \alpha_1 Insiderbuy + \alpha_2 Insidersell + \alpha_3 Controls + \varepsilon \tag{1}$$

The dependent variable is *GBnews*, an indicator variable equaling 1 (0) if a product or business expansion disclosure pertains to a good (bad) news disclosure, as defined previously. The treatment variable is *Insiderbuy* (*Insidersell*), which proxies for insiders' purchase (sale) incentives, as defined earlier. If H1$_a$ holds, the coefficient on *Insiderbuy* should be negative and statistically significant. If H2$_a$ holds, the coefficient for *Insidersell* should be significantly positive.

Following Nichols (2010), I control for earnings surprise (*EarSurprise*), book-to-market ratio (*BM*), firm size (*Size*), return on assets (*ROA*), institutional ownership (*Insti*), capital expenditures (*CapitalEx*), financial leverage (*Debt*), and industry-level litigation risk (*Litigation*). *EarSurprise* is an indicator variable for whether a firm's earnings surprise is positive for the current fiscal quarter. A positive earnings surprise (*EarSurprise*) is expected to be associated with a higher incidence of a good news disclosure (*Gbnews*). Prior research (e.g., Ball and Shivakumar, 2005; Francis and Martin, 2010; Jayaraman and Shivakumar, 2013) documents that conservative corporate reporting and disclosures curb value-destroying investment and financing activities. Therefore, firms with high institutional ownership (high financial leverage), which are subject to higher monitoring from institutional investors (creditors), are likely to be conservative in their voluntary disclosures. In a similar vein, larger firms are more mature in operating their business and hence are likely to be more conservative in their corporate disclosures. Hence, *Insti*, *Debt*, and *Size* should be negatively related to *GBnews*. Firms with good performance are likely to have more good news. Thus, *ROA* is expected to be positively associated with *GBnews*. Higher capital expenditures

(*CapitalEx*) imply more promising investment opportunities for a firm and are thus expected to be related to a higher incidence of a good news disclosure (*GBnews*).

I further control for abnormal trading volume (*Abtradvol*) and abnormal stock returns (*Qtrret*) to account for the impact of potential fundamental-related events on voluntary disclosures.[14] The controls of *Abtradvol* and *Qtrret* also mitigate the potential correlated-omitted-variables bias induced by fundamental-related events. All the control variables are constructed for the fiscal quarter that precedes the PBE announcement quarter.

Firm-fixed-effects logit regression

The firm-fixed-effects model is widely used in empirical research to control for cross-sectional heterogeneity and to mitigate the problem of endogeneity (Wooldrige, 2000; Amir et al., 2015). An effective firm-fixed-effects model requires that (1) unobservable firm characteristics, which affect both PBE disclosures and insider trades, are time-invariant and that (2) both the dependent variable (*GBnews*) and the treatment variables (*Insidersell* and *Insiderbuy*) display sufficient time-series variation.

Reduced-form difference-in-differences approach

I perform a reduced-form difference-in-differences specification where the treatment variables in model (1) are replaced with the variables for change in insider trades around a PBE disclosure (namely, *ChangeNetsell* and *ChangeNetbuy*, which are defined in Appendix I). The underlying control sample for the change specification comprises the observations that do not have any insider trade surrounding the PBE disclosures. The reduced-form difference-in-differences approach controls for firm-fixed effects, executive-fixed effects, and

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[14] Alternatively, I exclude observations that have an announcement of equity issuance, merger, acquisition, or stock repurchase over the PBE announcement quarters, and still obtain qualitatively the same results for the hypothesis tests.

macro-events that drive both insider trades and PBE disclosures, thereby alleviating the correlated-omitted-variables bias.

Two-stage-instrumental-variables regression

Managers' anticipation of the stock market reactions to PBE disclosures might deviate from the actual observed market reactions. In such a case, insiders would have to adjust the stock trades in a way that deviates from the trades that had been intended for before the PBE disclosures. This gives rise to another endogeneity concern: measurement errors, specifically, that the post-PBE-disclosure insider trades do not accurately capture the *ex ante* insider-trading incentives. Such type of endogeneity also potentially plagues prior studies (e.g., Cheng and Lo, 2006; Rogers, 2008; Cheng et al., 2013) which look at the post-disclosure insider trades, but had been addressed in their two-stage-instrumental-variables regression analysis. In line with the prior studies, I also adopt the two-stage-instrumental-variables regression, whereby tackling the endogeneity attributed to correlated-omitted-variables bias, measurement errors, and reverse causality. Its effectiveness in addressing the endogeneity problems, however, depends on the validity of instrumental variables (Larcker and Rusticus, 2010). A valid instrumental variable should be highly related to the endogenous treatment variables (in my case, the insider trading incentive proxies) but unrelated to the dependent variable (i.e., *GBnews*) except indirectly through the endogenous treatment variables.

I use two instrumental variables for the two-stage regression. The first is the number of stock option grants (*OptionG*). When granted more stock options, managers are more (less) likely to buy (sell) shares subsequently. Hence, *OptionG* is expected to be positively (negatively) correlated with *Insiderbuy* (*Insidersell*). However, *OptionG* is unlikely to have a direct impact upon the subsequent disclosure news, making it a valid instrumental variable.[15]

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[15] *OptionG* is measured over a fiscal quarter that ends at the beginning of the PBE announcement quarter.

The second instrument is the lagged insider trading made before PBE disclosures (i.e., *LagInsidersell* and *LagInsiderbuy*, which are defined in Appendix I). Prior research well documents (e.g., Cheng and Lo, 2006) that there exists auto-correlation for lead-lagged insider trades. Nonetheless, *LagInsidersell* and *LagInsiderbuy* have little direct impact on *GBnews* for two reasons. First, insiders generally refrain from trading their own shares before major price-relevant events (e.g., Garfinkel, 1997; Noe, 1999; Huddart et al., 2007; Roulstone, 2014), because doing so would evidence directly the violation of "disclose or abstain" trading rules and expose a firm to much higher legal jeopardy than if they were trading after the price-relevant events (to be further discussed and demonstrated in Section 6). Second, even if, by any chance, insiders traded before the disclosure events, in order to make the trades profitable, they would have traded in the opposite direction to the trading made after the disclosures, that is, insiders sell (buy) shares before bad (good) news disclosures, as opposed to buying (selling) shares after bad (good) news disclosures.[16] In this regard, the endogenous part of the insider trading regressor does not persist over time, which satisfies the condition for a lagged endogenous regressor being a valid instrument (Larcker and Rusticus, 2010).

In the first-stage regression, the variable for actual insider trades is regressed on the instrumental variables and on a set of control variables as included in model (1). The predicted insider trading obtained from the first-stage regression is estimated based on the past public information (as reflected in the control variables) for the previous fiscal quarter that precedes the PBE announcement quarter, and is thus unlikely to contain private information known only to the management (Cheng and Lo, 2006). As such, the predicted

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As a robustness check, I measure the option grant variable in a longer window, i.e., over a year ending at the beginning of the PBE announcement quarter, and obtain qualitatively identical results for the 2SLS estimation.

[16] Insiders are prevented by the short-swing profit rule from purchasing (selling) and selling (purchasing) their companies' shares within a 6-month period. Thus, if insiders opt to make the strategic trades immediately after corporate disclosures, they could barely execute a profitable pre-disclosure trading strategy due to the restriction from the short-swing profit rule. This reinforces the notion that *LagInsidersell* and *LagInsiderbuy* are least likely related to *Gbnews*.

insider trading, which replaces the actual insider trading in the second-stage regression, will not be affected by the PBE disclosures, thus mitigating the potential endogeneity bias caused by reverse causality.

5 Empirical results

Table 3 reports the logit regression results for the hypothesis tests. The coefficient for *Insiderbuy* is statistically significant at the 0.1% level with the expected negative sign, indicating that the incidence of a bad news disclosure on PBE information, relative to that of a good-news PBE disclosure, is positively correlated with insider purchases made shortly after the disclosure. This evidence suggests that when insiders plan to purchase shares from the market, they are more likely to disclose bad news on PBE information beforehand, which supports $H1_a$.[17]

The coefficient on *Insidersell* is positive and statistically significant, consistent with $H2_a$ that insiders tend to disclose good news on PBE information before selling shares. This result is in contrast with the prior research (e.g., Cheng and Lo, 2006) which finds no evidence that insiders provide good news earnings forecasts before selling shares. Indeed, insider sales after a good news disclosure are subject to high legal jeopardy, because the litigation risk associated with insider sales is amplified in good news earnings forecasts that, in themselves, entail high disclosure risk. However, the trading risk for insider sales might not be manifested in nonfinancial disclosures which entail low disclosure risk. Thus, the litigation costs associated with a good-news PBE disclosure being made before insider selling are likely to

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[17] Insider purchases can be attributed to managers' signaling of good future prospect of their firm. However, if managers *genuinely* aim at such signaling, they should avoid making stock purchases at a point that comes right after a PBE disclosure, since such stock purchases can be suspected as opportunistic rather than for the signaling purpose. Therefore, the results for $H1_a$ is less likely to be driven by managers' signaling via stock purchases.

be perceived by insiders as being lower than the expected trading gain. This explains why I find a high incidence of good news PBE disclosures being made before insider sales.

Table 4 presents the firm-fixed-effects logit regression results, which are qualitatively the same as those reported in Table 3. Table 5 shows the results for the reduced-form difference-in-differences specification. *ChangeNetbuy* has a highly significant coefficient in the predicted negative sign. This indicates that the incidence of a bad news disclosure of PBE information is associated with an increase in insider purchases, which is consistent with H1$_a$. The coefficient for *ChangeNetsell* is positive and statistically significant, and hence insiders' incentives to increase stock sales induce a higher likelihood of a good-news PBE disclosure, which lends support to H2$_a$. Collectively, the results in Table 4 and 5 elicit similar inferences as those in Table 3, substantiating that the main test results are insensitive to correcting for potential correlated-omitted-variables bias.

Table 6 presents the two-stage instrumental regression results. In the first-step OLS regression, *Insiderbuy* (*Insidersell*) is significantly, positively (negatively) correlated with *OptionG*. This is consistent with the notion that managers granted more stock options are more (less) likely to buy (sell) shares subsequently. Both *LagInsidersell* and *Laginsiderbuy* are significantly positive, indicating that insider trades are serially correlated. In the second-step probit regression, the fitted *Insiderbuy* takes on a significantly negative coefficient, which is consistent with H1$_a$. The coefficient for the fitted *Insidersell* is positive and statistically significant at the 0.1% level; this suggests that insiders are inclined to disclose good news on PBE before selling shares, and thus supports H2$_a$. Overall, the results in Table 6 corroborate that the results reported in Table 3 are not driven by the potential reverse causality.

Additionally, I conduct a falsification test to rule out the alternative explanation ascribed to the reverse causality. Specifically, I look at insider trades made by non-officer employees,

who are unlikely to influence corporate nonfinancial disclosure decisions. If, as hypothesized, it is the trading incentives that drive the disclosure decisions, I should find no results for trades made by the non-officer employees after PBE disclosures. If the alternative explanation drives the main results, I should find evidence that the low-tier insiders purchase (sell) shares intensively after bad (good) news PBE disclosures. My results for the falsification test are in line with the former.

6 Additional tests

Do managers tend to time their PBE disclosures in a way that follow insider trades?

The litigation risk for trading before price-relevant corporate events is substantially higher than that for trading after the price-relevant events. Hence, insiders generally abstain from trading shares ahead of price-relevant corporate events, and instead shift their trading to follow those events (Garfinkel, 1997; Noe, 1999; Huddart et al., 2007). Accordingly, prior studies (e.g., Givoly and Palmon, 1985; Sivakumar and Waymire, 1994; Garfinkel, 1997; Noe, 1999; Huddart et al., 2007) find little or no association between insider trades and corporate news released within the next quarter. Building upon this strand of prior research, I conduct an additional test on whether insiders are likely to buy (sell) shares shortly before a good (bad) news PBE disclosure. In particular, I run a logit regression of *GBnews* on *LagInsidersell*, *LagInsiderbuy*, and a set of control variables. The treatment variables, *LagInsidersell* and *LagInsiderbuy*, measure the extent of insider sales and of insider purchases, respectively, over 30 days before a PBE disclosure, and are both defined in Appendix I. The control variables are the same as those included in model (1). The regression results (not tabulated) reveal that the coefficient for *LagInsidersell* and *LagInsiderbuy* are both statistically insignificant.[18] Hence, there is no evidence indicating that managers tend to

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[18] This result is not sensitive to correcting for potential endogeneity using the approaches specified in

strategically time their stock purchases (sales) to precede good (bad) news PBE disclosures. This reconciles with prior findings in the literature (e.g., Noe, 1999; Ke et al., 2003; Huddart et al., 2007) that insiders refrain from trading shares before major corporate news to avoid legal jeopardy associated with this strategic trading behavior.

Self-selection of whether to voluntarily provide a PBE disclosure

The hypothesis tests are conditioned on management's decisions to voluntarily disclose PBE information. This might give rise to sample selection bias because observations that have insider trades but do not have a PBE disclosure are omitted from the regression analyses. I employ a two-stage Heckman probit regression model to control for the potential sample selection bias. The first-stage regression is modeled by a probit regression of management's decision to voluntarily provide a PBE disclosure, where the dependent variable is the incidence of a PBE disclosure (namely, *Inci*, which is defined in Appendix I). The Inverse Mills ratio estimated from the first-stage regression is then included in the second-stage regression, which is modeled by model (1), to control for the selectivity bias. An effective Heckman (1979) model requires that exclusion restriction variables be validly included (excluded) in (from) the first- (second-) stage regression (Little, 1985; Puhani, 2000; Lennox et al., 2012). In my case, the valid exclusion restriction variables should be related to the incidence of a PBE disclosure (*Inci*) but unrelated to the disclosure news (*GBnews*).

I identify four exclusion restriction variables, namely, earnings volatility (*EarningsVol*) and three distinct proxies for proprietary costs of disclosures (*EntryCo*, *Mktsize*, and *Substi* per Karuna (2007)), all of which are defined in Appendix I. High business risk for a firm, featured by high earnings volatility, would trigger outsiders' greater demand for disclosure transparency. Therefore, *EarningsVol* is expected to be positively associated with the

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Section 4, nor sensitive to the two robustness tests to be covered in the follow-up two subsections.

incidence of a PBE disclosure (*Inci*). However, *EarningsVol* should have little association with the relative likelihood of a good-news vis-à-vis bad-news PBE disclosure (*GBnews*), and hence could be validly excluded from the second-stage regression.

Disclosures of PBE information increase a firm's risk of leaking its relevant proprietary information to product market competitors. A firm that has lower product substitutability (lower *Substi*), lower entry costs (lower *EntryCo*), or larger market size of competing products (higher *Mktsize*) faces more intense industry-level product market competition and thus is subject to higher proprietary costs of disclosures (Karuna, 2007). Accordingly, the incidence of a PBE disclosure (*Inci*) should be negatively associated with *Mktsize* and positively associated with *Substi* and *Entryco*. However, given the decision to disclose PBE information, the proprietary costs of disclosures should not have further impact on the disclosure news (*GBnews*).[19] Hence, *EntryCo*, *Mktsize*, and *Substi* should also be the valid exclusion restriction variables for the Heckman model.

In the first-stage probit regression, *Inci* is regressed on the four exclusion restriction variables and on a set of control variables as included in model (1). Table 7 reports the Heckman regression results. *EntryCo* and *Mktsize* are statistically significant in the expected sign. The coefficients on *Insidersell* and *Insiderbuy* are qualitatively identical to those reported in Table 3. It is possible that there is no systematic difference in firm characteristics across the disclosure sample and the nondisclosure sample. In this case, selectivity will not bias the coefficient estimates. Should the exclusion restriction variables be valid for the Heckman estimation procedure, rho equaling 0 would indicate that there exists no sample

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[19] One may argue that given the high proprietary costs of disclosures, firms that choose to disclose PBE plans tend to disclose good news on them. However, it's not clear that the proprietary costs of good news disclosures are lower than the proprietary costs of bad news disclosures. Good PBE news could also become disadvantageous once disclosed, because market competitors may learn or even imitate something good from a firm that made the good news disclosure. More importantly, regardless of whether it is good news or bad news that is released to the public, proprietary information will have been made publicly available upon the disclosure. Therefore, given the decision to voluntarily make a PBE disclosure, the proprietary costs should not be further related to the news content of the PBE disclosure.

selection bias. As reported in Table 7, rho is not statistically different from 0, which thus serves as another evidence that my main results are immune from the potential sample selection bias. In addition, I conduct a multinomial logit regression for model (1) using the full sample, whereby the potential selection bias would be corrected (Bourguignon et al. 2007). The inferences for H1 & H2 remain unchanged for applying the multinomial logit specification.

Confounding effects from bundled PBE disclosures

If PBE disclosures are bundled contemporaneously with earnings announcements, the return-based measures of PBE disclosure news may introduce bias into my results. I address this issue as with, e.g., Ball et al. (2012). Specifically, I regress *GBnews* on earnings surprise, which is defined as reported earnings per share (henceforth, EPS) minus the median consensus analyst EPS forecast issued within 90 days prior to the actual EPS announcement date, for those "bundled" PBE disclosure observations, and treat the residual as the market reaction to the PBE disclosure news only. Should the residual be positive (negative), the PBE disclosure is classified as a good (bad) news disclosure. For the PBE disclosures that coincide with management earnings forecasts, I apply a similar procedure to separate the PBE-disclosure-related news from the forecast-related news. In particular, I regress *GBnews* on earnings forecast news, which is defined as managers' forecast of EPS minus the median consensus analyst EPS forecast issued within 90 days prior to the management forecast date, to obtain the residual for the disclosure news classification. My inferences for H1 & H2 remain unchanged when I use these alternative news measures for PBE disclosures.[20]

7 Conclusion

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[20] Alternatively, I tease out those "bundled" PBE announcements, which occur within one day around earnings announcements or management earnings forecasts, and obtain almost identical results.

Disclosures of product and business expansion information have strong implications for long-term streams of a firm's future earnings and are relatively hard to verify. Therefore, PBE disclosure is a potent instrument that managers can use to fulfil self-serving incentives. This study examines whether managers strategically choose nonfinancial disclosure policies to increase their personal trading profits. I focus on managers' manipulation of the timing and selectivity of the voluntary nonfinancial disclosures of PBE plans, because such type of discretionary disclosure is not only powerful in altering information flows and influencing short-term stock prices but also hard for outsiders to see through and legally charge with. It is posited that managers trade off both the benefits and costs of the strategic PBE disclosures before insider trades. I find that managers tend to release bad news on PBE information prior to purchasing shares, a result I attribute to low litigation costs associated with insider purchases and with bad news nonfinancial disclosures. Unlike insider purchases, insider sales are associated with higher litigation risk (Cheng and Lo, 2006; Rogers, 2008), but such litigation risk might not manifest itself in selective nonfinancial disclosures which entail low disclosure risk. Or rather, insider sales, even when accompanying a good-news PBE disclosure, might not be regarded as strategic and thus not induce substantive legal costs, because the completeness and timeliness of a PBE disclosure are hard to discern or authenticate. Consistent with this rationale, I find evidence that managers tend to make a good news disclosure on PBE information before selling shares, suggesting that the litigation costs of this strategic behavior are perceived by insiders as being lower than the expected trading gain. Overall, my evidence contributes to understanding the impact of insider trading incentives on strategic nonfinancial disclosures, and should be of interest to boards of directors that monitor and restrict opportunistic disclosures and insider trades within a firm.

Managers may bias their PBE disclosures to manipulate information flows, with the aim of grabbing more trading profits. But there exists far less room for managers to bias PBE

disclosures that concern a firm's real business activities, compared to a quantitative financial disclosure. If, on the other hand, managers distort their PBE disclosures substantively, their firm would risk suffering much from reputational losses and litigation; this is because such bias in PBE disclosures, even if not verifiable in a short run, can still be discerned in the long run. Thus, it is more likely that firm management resorts to manipulating the timing and selectivity of PBE disclosures (which is more powerful in affecting stock prices, less likely to detect, and less subject to potential reputational losses and litigation) rather than distorting the news content of PBE disclosures, the former of which is therefore the focus of this study. It is interesting to look further at whether and how disclosure bias may complement disclosure timing and selectivity in managers' disclosure strategies designed to serve and achieve personal trading incentives. Nonetheless, unlike management earnings forecasts for which we have audited earnings reports as the benchmark to assess potential forecast bias, there is lack of an objective, clear-cut benchmark to appraise consistently whether and to what extent a PBE disclosure is biased. Reasonable researchers and practitioners may hold different perspectives, and can reasonably disagree to a substantive degree, on the news content of PBE disclosures. Moreover, we do not have access to firms' private information to verify PBE disclosures. Therefore, it remains an academic challenge to probe and assess bias, if any, in the PBE disclosures. I leave this as an avenue for future research.

Managers may manipulate the precision of PBE disclosures by making bad news disclosures more ambiguous (precise) than good news disclosures, whereby inflating (deflating) stock prices. Such disclosure strategy entails relatively low detection risk, low reputation risk, and low litigation risk for a firm, and hence is an instrument managers might also use to grab more trading gain. Nonetheless, it is difficult for an archival study to determine and test the degree of ambiguity in the news content of a qualitative PBE disclosure. I therefore leave this issue for future research as well.

References

Aboody, D., and R. Kasznik. 2000. CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics* 29: 73-100.

Amir, E., J.M. Carabias, J. Jona, and G. Livne. 2015. Fixed effects in empirical accounting research. Working paper, City University of London.

Arshadi, N. 1998. Insider trading liability and enforcement strategy. *Financial Management* 27: 70-84.

Baginski, S.P., J.L. Campbell, and L.A. Hinson. 2017. Do career concerns affect the delay of bad news disclosure? *The Accounting Review*, Forthcoming.

Bakke, T.E., and T.M. Whited. 2010. Which firms follow the market? An analysis of corporate investment decisions. *Review of Financial Studies* 23: 1941-1980.

Ball, R., and L. Shivakumar. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39: 83-128.

Ball, R., S. Jayaraman, and L. Shivakumar. Audited financial reporting and voluntary disclosure as complements: A test of the confirmation hypothesis. *Journal of Accouting and Economics* 53 (1-2): 136-166.

Bourguignon, F., M. Fournier, and M. Gurgand. 2007. Selection bias corrections based on the multinomial logit model: Monte Carlo comparisons. *Journal of Economics Survey* 21: 174-205.

Brockman, P., I.K. Khurana, and X. Martin. 2008. Voluntary disclosures around share repurchases. *Journal of Financial Economics* 89: 175-191.

Bushee, B.J., D.A. Matsumoto, and G.S. Miller. 2003. Open versus closed conference calls: the determinants and effects of broadening access to disclosure. *Journal of Accounting and Economics* 34 (1-3): 149-180.

Bushman, R.M., and R.J. Indjejikian. 1995. Voluntary disclosures and the trading behavior of corporate insiders. *Journal of Accounting Research* 33: 293-316.

Chen, Q., I. Goldstein, and W. Jiang. 2007. Price informativeness and investment sensitivity to stock price. *Review of Financial Studies* 20: 619-650.

Chen, S., D. Matsumoto, and S. Rajgopal. 2011. Is silence golden? An empirical analysis of firms that stop giving quarterly earnings guidance. *Journal of Accounting and Economics* 51 (1-2): 134-150.

Cheng, Q., and K. Lo. 2006. Insider trading and voluntary disclosures. *Journal of Accounting Research* 44: 815-848.

Cheng, Q., T. Luo, and H. Yue. 2013. Managerial incentive and management forecasts precision. *The Accounting Review* 88: 1575-1602.

Cheng, Q., and T.D. Warfield. 2005. Equity incentives and earnings management. *The Accounting Review* 80: 441-476.

Choi, J., L.A. Myers, Y. Zang, and D.A. Ziebart. 2010. The role that forecast surprise and forecast error play in determining management forecast precision. *Accounting Horizon* 24: 165-188.

Donelson, D.C., J. Mclnnis, R.D. Mergenthaler, and Y. Yu. 2012. The timeliness of bad earnings news and litigation risk. *The Accounting Review* 87: 1967-1991.

Dutta, S., and S. Reichelstein. 2003. Leading indicator variables, performance measurement, and long-term versus short-term contracts. *Journal of Accounting and Economics* 41: 837-866.

Dutta, S., and S. Reichelstein. 2005. Stock price, earnings, and book value in managerial performance measures. *The Accounting Review* 80: 1069-1100.

Dye, R.A. 1985. Disclosure of Nonproprietary Information. *Journal of Accounting Research* 23 (1): 123-45.

Field, L., M. Lowry, and S. Shu. 2005. Does disclosure deter or trigger litigation? *Journal of Accounting and Economics* 39: 487-507.

Foucault, T., and L. Fresard. 2012. Cross-listing, investment sensitivity to stock price and the learning hypothesis. *Review of Financial Studies* 25: 3305-3350.

Foucault, T., and L. Fresard. 2014. Learning from peers' stock prices and corporate investment. *Journal of Financial Economics* 111: 554-577.

Francis, J., and X. Martin. 2010. Acquisition profitability and timely loss recognition. *Journal of Accounting and Economics* 49: 161-178.

Frankel, R., M. McNichols, and G. Wilson. 1995. Discretionary disclosure and external financing. *The Accounting Review* 70: 135-150.

Garfinkel, J. 1997. New evidence on the effects of federal regulations on insider trading: the insider trading and securities fraud enforcement act. *Journal of Corporate Finance* 3: 89-111.

Ge, R., and C. Lennox. 2011. Do acquirers disclose good news or withhold bad news when they finance their acquisitions using equity? *Review of Accounting Studies* 16: 183-217.

Givoly, D., and D. Palmon. 1985. Insider trading and the exploitation of inside information: some empirical evidence. *Journal of Business* 58: 69-87.

Graham, J.R., C.R. Harvey, and S. Rajgopal. 2005. The Economic implications of corporate financial reporting. *Journal of Accounting and Economics* 40 (1-3): 3-73.

Hafzalla, N.M. 2009. Managerial incentives for discretionary disclosure: Evidence from management leveraged buyouts. *Review of Accounting Studies* 14 (4): 507-533.

He, G. 2017. Credit ratings and managerial voluntary disclosures. *The Financial Review*, Forthcoming.

Heckman, J. 1979. The sample selection bias as a specification error. *Econometrica* 47: 153-162.

Huddart, S., and B. Ke. 2007. Information asymmetry and cross-sectional variation in insider trading. *Contemporary Accounting Research* 24: 195-232.

Huddart, S., B. Ke, and C. Shi. 2007. Jeopardy, non-public information, and insider trading around SEC 10-K and 10-Q filings. *Journal of Accounting and Economics* 43: 3-36.

Hutton, A. 2007. A discussion of "corporate disclosure by family firms." *Journal of Accounting and Economics* 44: 287-297.

Jayaraman, S., and L. Shivakumar. 2013. Agency-based demand for conservatism: evidence from state adoption of antitakeover laws. *Review of Accounting Studies* 18: 95-134.

Jensen, M., and W. Meckling. 1976. Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics* 3: 305-360.

Jagolinzer, A.D., and D.T. Roulstone. 2009. The effects of insider trading regulation on trading timing, litigation risk, and profitability. Working paper, Stanford University.

Johnson, M.F., K.K. Nelson, and A.C. Pritchard. 2004. The impact of the private securities litigation reform act of 1995. *Review of Accounting Studies* 5: 217-233.

Jung, W, and Y.K. Kwon. 1988. Disclosure when the market is unsure of information endowment of managers. *Journal of Accounting Research* 26 (1): 146-153.

Karuna, C. 2007. Industry product market competition and managerial incentives. *Journal of Accounting and Economics* 43: 275-297.

Ke, B., S. Huddart, and K. Petroni. 2003. What insiders know about future earnings and how they use it? Evidence from insider trades. *Journal of Accounting and Economics* 35: 315-346.

Kim, J.B. 2016. Accounting flexibility and managers' forecast behavior prior to seasoned equity offerings. *Review of Accounting Studie*s 21 (4): 1361-1400.

Lang, M., and R. Lundholm. 2000. Voluntary disclosure and equity offerings: reducing information asymmetry or hyping the stock? *Contemporary Accounting Research* 17: 623-662.

Larcker, D.F., and T.O. Rusticus. 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49: 186-205.

Lennox, C., J.R. Francis, and Z. Wang. 2012. Selection model in accounting research. *The Accounting Review* 87: 589-616.

Little, R. 1985. A note about models for selectivity bias. *Econometrica* 53: 1469-1474.

Loureiro, G., and A.G. Taboada. 2015. Do improvements in the information environment enhance insiders' ability to learn from outsiders? *Journal of Accounting Research* 53: 863-905.

Marquardt, C., and C. Wiedman. 1998. Voluntary disclosure, information asymmetry, and insider selling through secondary equity offerings. *Contemporary Accounting Research* 15: 505-537.

Nagar, V., D. Nanda, and P. Wysocki. 2003. Discretionary disclosure and stock-based incentives. *Journal of Accounting and Economics* 34: 283-309.

Nichols, D.C. 2010. Proprietary costs and other determinants of nonfinancial disclosures. Working paper, Cornell University.

Niehaus, G., and G. Roth. 1999. Insider trading, equity issues, and CEO turnover in firms subject to securities class action. *Financial Management* 28: 52-72.

Noe, C. 1999. Voluntary disclosures and insider transactions. *Journal of Accounting and Economics* 27: 305-326.

Ofek, E., and D. Yermack. 2000. Taking stock: equity-based compensation and the evolution of managerial ownership. *Journal of Finance* 55: 1367-1384.

Puhani, P. 2000. The Heckman correction for sample selection and its critique. *Journal of Economic Surveys* 14: 53-68.

Rogers, J.L., and P.C. Stocken. 2005. Credibility of management forecasts. *The Accounting Review* 80: 1233-1260.

Rogers, J.L. 2008. Disclosure quality and management trading incentives. *Journal of Accounting Research* 46: 1265-1296.

Roulstone, D.T. 2014. Insider trading and the information content of earnings announcements. Working paper, Ohio State University.

Sivakumar, K., and G. Waymire. 1994. Insider trading following material news events: Evidence from earnings. *Financial Management* 23: 23-32.

Skinner, D.J. 1994. Why firms voluntarily disclose bad news? *Journal of Accounting Research* 32: 38-60.

Skinner, D. 1997. Earnings disclosure and stockholder lawsuits. *Journal of Accounting and Economics* 23: 249-283.

Suijs, J. 2007. Voluntary disclosure of information when firms are uncertain of investor response. *Journal of Accounting and Economics* 43 (2-3): 391-410.

Verrecchia, R.E. 2001. Essays on disclosure. *Journal of Accounting and Economics* 32: 97-180.

Wooldridge, J. 2000. Introductory econometrics: a modern approach. First edition. New York: South-Western College Publishing.

Zuo, L. 2016. The informational feedback effect of stock prices on management forecasts. *Journal of Accounting and Economics* 61 (2): 391-413.

Table 1 Descriptive statistics

	Mean	Std.dev.	Median	N
Main variables				
GBnews	0.5187	0.4997	1	10162
Insidersell	3.4028	5.1000	0	10162
Insiderbuy	0.8948	2.8145	0	10162
Control variables				
EarSurprise	0.5627	0.4961	1	10162
Size	6.6526	2.1362	6.4533	10162
Insti	0.6315	0.3450	0.5631	10162
Abtradvol	1.0847	103.00	-0.0022	10162
Qtrret	0.0164	0.2913	-0.0098	10162
BM	0.4688	0.6554	0.3645	10162
Roa	-0.0220	0.1311	0.0073	10162
Litig	0.5659	0.4957	1	10162
CapitalEx	0.0257	0.0401	0.0132	10162
Debt	0.2485	1.1557	0.0119	10162

Notes: This table tabulates the descriptive statistics of the variables used in the regression analyses. The sample incorporates observations that contain product or business expansion information during the period of 2002-2012. All the variables are defined in Appendix I.

TABLE 2 Spearman correlation matrix

	Gbnew	Insidersell	Insiderbuy	EarSurprise	Size	Insti	Abtradvol	Qtrret	BM	Roa	Litig	CapitalEx	Debt
Gbnews	1												
Insidersell	0.0329 (0.001)***	1											
Insiderbuy	-0.0230 (0.021)**	0.0635 (0.000)***	1										
EarSurprise	0.0345 (0.001)***	0.0989 (0.000)***	-0.0285 (0.004)***	1									
Size	-0.0385 (0.000)***	0.3162 (0.000)***	-0.0304 (0.002)***	0.1064 (0.000)***	1								
Insti	-0.0334 (0.001)***	0.2503 (0.000)***	-0.0088 (0.375)	0.0269 (0.007)***	0.5040 (0.000)***	1							
Abtradvol	-0.0108 (0.276)	0.0300 (0.003)***	0.0098 (0.322)	0.0755 (0.000)***	0.0383 (0.000)***	0.0032 (0.745)	1						
Qtrret	-0.0027 (0.789)	0.1181 (0.000)***	-0.0366 (0.000)***	0.1116 (0.000)***	0.1513 (0.000)***	0.0663 (0.000)***	0.2463 (0.000)***	1					
BM	0.0081 (0.415)	-0.1522 (0.000)***	0.0208 (0.036)**	-0.1346 (0.000)***	-0.2301 (0.000)***	0.0172 (0.083)*	-0.1171 (0.000)***	-0.1993 (0.000)***	1				
Roa	-0.0177 (0.074)*	0.2462 (0.000)***	-0.0256 (0.010)***	0.3038 (0.000)***	0.4842 (0.000)***	0.3156 (0.000)***	0.0491 (0.000)***	0.1209 (0.000)***	-0.1081 (0.000)***	1			
Litig	0.0008 (0.937)	0.0198 (0.046)**	-0.0127 (0.200)	0.0326 (0.001)***	-0.0523 (0.000)***	-0.0495 (0.000)***	-0.0131 (0.186)	-0.0037 (0.706)	-0.1140 (0.000)***	-0.1094 (0.000)***	1		
CapitalEx	0.0046 (0.645)	0.0842 (0.000)***	0.0280 (0.004)***	-0.0368 (0.000)***	0.1840 (0.000)***	0.0989 (0.000)***	-0.0272 (0.006)***	-0.0016 (0.874)	-0.0952 (0.000)***	0.1613 (0.000)***	-0.1511 (0.000)***	1	
Debt	0.0084 (0.400)	-0.0482 (0.000)***	0.0488 (0.000)***	-0.0063 (0.526)	0.2144 (0.000)***	0.0815 (0.000)***	-0.0101 (0.307)	-0.0125 (0.208)	0.0729 (0.000)***	-0.0334 (0.001)***	-0.2309 (0.000)***	0.1353 (0.000)***	1

This table presents the Spearman correlations among the variables used in the baseline regression. 10,162 observations are involved in the correlation tests. All the variables are defined in Appendix I. The figures in parentheses are the p-values for the Spearman correlations. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels (two-tailed), respectively.

Table 3 Tests of H1 & H2: The effect of inside trading incentives on voluntary PBE disclosures

Variables	Pred.sign	Dependent Variable = *GBnews*
Intercept	?	0.0990 (0.562)
Insidersell	**?**	**0.0212** **(<0.001)*****
Insiderbuy	**-**	**-0.0184** **(0.013)****
EarSurprise	+	0.1620 (<0.001)***
Size	-	-0.0282 (0.024)**
Insti	-	-0.1941 (0.007)***
Abtradvol	?	-1.54E-4 (0.502)
Qtrret	?	0.0584 (0.393)
BM	?	0.0291 (0.399)
Roa	+	-0.3117 (0.086)*
Litig	?	-0.0056 (0.897)
CapitalEx	+	1.1281 (0.015)**
Debt	-	0.0191 (0.274)
Observations		10162
Waldχ^2		92.65

Notes: This table reports the logit regression results for the tests of H1&H2. The sample period ranges from 2002 to 2012. The dependent variable is *GBNews*. All the variables are defined in Appendix I. Year and quarter dummies are included in the regression but not reported for brevity. The *p* values in parentheses are based on robust standard errors clustered by firm. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

Table 4 Tests of H1 & H2: Control for endogeneity using firm-fixed-effects model

Variables	Dependent Variable = *GBnews*
Insidersell	**0.0254**
	(<0.001)***
Insiderbuy	**-0.0201**
	(0.022)**
EarSurprise	0.1593
	(0.001)***
Size	-0.0539
	(0.297)
Insti	-0.3247
	(0.099)*
Abtradvol	-1.37E-4
	(0.679)
Qtrret	0.0476
	(0.520)
BM	0.1441
	(0.026)**
Roa	-0.2040
	(0.470)
CapitalEx	1.6166
	(0.026)**
Debt	0.0479
	(0.276)
Observations	9685
Waldχ^2	88.17

Notes: This table reports the firm-fixed-effects logit regression results for the tests of H1 & H2. The sample period ranges from 2002 to 2012. The dependent variable is *GBNews*. All the variables are defined in Appendix I. Because of no within-firm variance in *Litigation* variable, it is automatically omitted by the firm-fixed-effects model. Year and quarter dummies are included in the regression but not reported for brevity. The p-values in parentheses are based on the standard errors clustered by firm and estimated using 50 bootstrap replications. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

Table 5 Tests of H1 & H2: Control for endogeneity using a reduced-form difference-in-differences specification

Variable	Dependent Variable = *GBnews*
Intercept	0.0604
	(0.707)
ChangeNetsell	**0.0216**
	(<0.001)***
ChangeNetbuy	**-0.0224**
	(<0.001)***
EarSurprise	0.1744
	(<0.001)***
Size	-0.0203
	(0.101)
Insti	-0.1389
	(0.051)*
Abtradvol	-1.38E-4
	(0.539)
Qtrret	0.0763
	(0.267)
BM	0.0209
	(0.539)
Roa	-0.2803
	(0.118)
Litig	-0.0015
	(0.972)
CapitalEx	1.1658
	(0.011)**
Debt	0.0143
	(0.408)
Observations	10162
Waldχ^2	104.19

Notes: This table reports the logit regression results for the hypothesis tests using reduced-form difference-in-differences specification. The sample period ranges from 2002 to 2012. The dependent variable is *GBNews*. All the variables are defined in Appendix I. Year and quarter dummies are included in the regression but not reported for brevity. The p-*values* in parentheses are based on robust standard errors clustered by firm. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

Table 6 Tests of H1 & H2: Control for endogeneity using two-stage-instrumental-variables approach

Variable	(a1) 1st-stage *Insidersell*	(a2) 2nd-stage *GBnews*	(b1) 1st-stage *Insiderbuy*	(b2) 2nd-stage *GBnews*
Intercept	-7.9441 (<0.001)***	-0.0116 (0.942)	8.9906 (<0.001)***	0.1482 (0.373)
Insidersell		**0.0220 (<0.001)***		
Insiderbuy				**-0.0160 (0.035)**
OptionG	-0.0050 (0.009)***		0.0080 (0.089)*	
LagInsidersell	0.0595 (<0.001)***			
LagInsiderbuy			0.0887 (<0.001)***	
EarSurprise	0.1492 (0.039)**	0.1632 (<0.001)***	0.0690 (0.649)	0.1741 (<0.001)***
Size	0.2878 (<0.001)***	-0.0278 (0.026)**	-0.0788 (0.038)**	-0.0176 (0.153)
Insti	-0.2695 (0.027)**	-0.1945 (0.007)***	0.5839 (0.023)**	-0.1483 (0.037)**
Abtradvol	4.57E-4 (0.041)**	-1.64E-4 (0.473)	-4.06E-4 (0.408)	-1.66E-4 (0.449)
Qtrret	0.5034 (<0.001)***	0.0624 (0.362)	0.1892 (0.492)	0.0756 (0.268)
BM	0.2236 (0.006)***	0.0291 (0.399)	-0.0586 (0.656)	0.0224 (0.505)
Roa	2.2354 (<0.001)***	-0.3163 (0.082)*	-1.1787 (0.081)*	-0.2785 (0.122)
Litig	0.2316 (0.001)***	-0.0068 (0.875)	-0.0480 (0.748)	0.0030 (0.943)
CapitalEx	0.6044 (0.452)	1.1078 (0.016)**	2.4480 (0.158)	1.2207 (0.008)***
Debt	-0.1527 (0.019)**	0.0181 (0.299)	0.0069 (0.906)	0.0146 (0.399)
Observations		10162		10162
F-stat./Waldχ^2	41.49	88.39	3.40	67.47

Notes: This table presents the results for the hypothesis tests using two-stage-instrumental-variables regressions. The sample period ranges from 2002 to 2012. In the first-stage OLS regression, the dependent variables are *Insidersell* (*Insiderbuy*), respectively, and the instrument variables are *OptionG* and *LagInsidersell* (*LagInsiderbuy*). In the second-stage regression, the dependent variable is *GBNews*, and the treatment variables are the fitted *Insidersell* and *Insiderbuy* that are estimated from the first-stage regression. All the variables are defined in Appendix I. Year and quarter dummies are included but not reported for brevity. The p-values in parentheses are based on robust standard errors clustered by firm. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

Table 7 Tests of H1 & H2: Control for sample selection bias using two-stage Heckman probit regression

Variable	(1) 1st-stage Inci	(2) 2nd-stage GBnews
Intercept	1.7642 (<0.001)***	-0.1039 (0.336)
Insidersell		**0.0124 (<0.001)***
Insiderbuy		**-0.0106 (0.019)**
EarningsVol	-0.0001 (0.408)	
Entryco	4.99E-6 (0.030)**	
Mktsize	-6.54E-7 (0.006)***	
Substi	-0.1414 (0.550)	
EarSurprise	0.0824 (0.039)**	0.1065 (<0.001)***
Size	-0.1492 (<0.001)***	-0.0398 (<0.001)***
Insti	0.1002 (0.213)	-0.0836 (0.079)*
Abtradvol	1.64E-4 (0.002)***	-4.95E-5 (0.677)
Qtrret	0.0567 (0.479)	0.0437 (0.292)
BM	-0.1042 (0.001)***	0.0070 (0.744)
Roa	0.0084 (0.956)	-0.1701 (0.114)
Litig	-0.1437 (0.018)**	-0.0317 (0.245)
CapitalEx	0.5458 (0.431)	0.8138 (0.006)***
Debt	-0.0263 (0.174)	0.0091 (0.450)
χ^2 (for whether rho =0)		1.86 (0.172)
Observations	21618	10156
Waldχ^2	531.69	92.68

Notes: This table presents the results for the hypothesis tests using two-stage Heckman probit regression. The sample period ranges from 2002 to 2012. In the first-stage probit regression, the dependent variable is *Inci*, which equals 1 if a firm delivers a PBE disclosure during a fiscal quarter and 0 otherwise. The exclusion restriction variables are *EarningsVol*, *EntryCo*, *Mktsize*, and *Substi*. In the second-stage probit regression, the dependent variable is *GBNews*, and the treatment variables are *Insidersell* and *Insiderbuy*. All the variables are defined in Appendix I. Year and quarter dummies are included but not reported for brevity. The p-values in parentheses are based on robust standard errors clustered by firm. ***, **, * denote statistical significance at 1%, 5%, and 10% levels (two-tailed), respectively.

Appendix I   Summary of variable definitions

Variables	Definitions
Dependent variables	
GBNews	1 if a firm delivers a good news disclosure of PBE information, and equals 0 if a firm makes a bad news disclosure. The nature of the disclosure news is measured by the daily stock returns around a PBE disclosure. In particular, *GBNews* equals 1 if the cumulative abnormal stock returns in the 3-day window surrounding a PBE announcement are positive, and equals 0 if the cumulative abnormal stock returns are negative. The cumulative abnormal returns are calculated using the market model with an estimation period of [-181, -2] relative to the announcement date for a firm.
Inci	1 if a firm voluntarily makes a PBE disclosure for a fiscal quarter and 0 otherwise.
Treatment variables	
Insidersell	The natural logarithm of 1 plus net insider sales over the 30 days after a PBE disclosure, if a firm has a positive amount of net insider sales over the 30-day window. *Insidersell* equals 0 if the firm's amount of net insider sales over the 30-day window is negative or zero.
Insiderbuy	The natural logarithm of 1 plus net insider purchases over the 30 days after a PBE disclosure, if a firm has a positive amount of net insider purchases over the 30-day window. *Insiderbuy* equals 0 if the firm's amount of net insider purchases over the 30-day window is negative or zero.
LagInsidersell	The natural logarithm of 1 plus net insider sales over the 30 days prior to a PBE disclosure, if a firm has a positive amount of net insider sales over the 30-day window. *LagInsidersell* equals 0 if the firm's amount of net insider sales over the 30-day pre-disclosure window is negative or zero.
LagInsiderbuy	The natural logarithm of 1 plus net insider purchases over the 30 days prior to a PBE disclosure, if a firm has a positive amount of net insider purchases over the 30-day window. *LagInsiderbuy* equals 0 if the firm's amount of net insider purchases over the 30-day pre-disclosure window is negative or zero.
ChangeNetsell	*Insidersell* minus *LagInsidersell*, which measures change in net insider sales 30 days surrounding a PBE announcement.
ChangeNetbuy	*Insiderbuy* minus *LagInsiderbuy*, which measures change in net insider purchases 30 days surrounding a PBE announcement.
Instrumental/exclusion restriction variables	
OptionG	The number of options granted over a fiscal quarter preceding the PBE announcement quarter.
EarningsVol	The standard deviation of a firm's quarterly earnings over 12 quarters ending at the end of a fiscal quarter preceding the PBE announcement quarter.
Entryco	The average gross PPE in an industry, weighted by each firm's sales in the same 4-digit SIC industry, for a fiscal quarter preceding the PBE announcement quarter.
Mktsize	The sum of sales in a 4-digit SIC industry for a fiscal quarter preceding the PBE announcement quarter.
Substi	The sum of operating costs in the same industry, divided by the sum of sales in a 4-digit SIC industry, for a fiscal quarter preceding the PBE announcement quarter.
Control variables	
EarSurprise	1 if EPS of a quarter (that ends before the PBE announcement quarter) is greater than EPS of the same quarter in the previous year and 0 otherwise.
Size	The natural logarithm of market value of equity at the end of a fiscal quarter that ends before the PBE announcement quarter.
Insti	Institutional ownership as a percentage of outstanding shares for a fiscal quarter preceding the PBE announcement quarter.
Abtradvol	Quarterly abnormal dollar trading volume (in millions) for a fiscal quarter

	that ends before the PBE announcement quarter.
Qtrret	Quarterly abnormal stock returns for a fiscal quarter that ends before the PBE announcement quarter.
BM	Book value of firm equity, divided by market value of firm equity at the end of a fiscal quarter preceding the PBE announcement quarter.
Roa	Return on total assets for a fiscal quarter preceding the PBE announcement quarter.
Litig	1 for firms in the biotechnology (2833-2836 and 8731-8734), computers (3570-3577 and 7370-7374), electronics (3600-3674), and retail (5200-5961) industries and 0 otherwise.
CapitalEx	Capital expenditure divided by total assets for a fiscal quarter preceding the PBE announcement quarter.
Debt	The ratio of long-term debt to total assets for a fiscal quarter that ends before the PBE announcement quarter.

Appendix II   Examples of product and business expansion disclosures

1. **An example of product information plan --- *American Express Introduces New Online and Mobile Payment Security Services***

"*New York, November 3, 2014---American Express today announced the launch of its American Express Token Service, a suite of solutions designed to enable its card-issuing partners, processors, acquirers and merchants to create a safer online and mobile payments environment for consumers.*

With American Express Token Service, traditional card account numbers are replaced with unique "tokens," which can then be used to complete payment transactions online, in a mobile app or in-store with a mobile Near Field Communication (NFC)-enabled device. By using tokens, merchants and digital wallet operators will no longer need to store consumers' sensitive payment account information in their systems. In addition, tokens can be assigned for use with a specific merchant, transaction type or payment device to provide further protection against fraud.

Based on EMVCo's Payment Tokenization Specification and Technical Framework published earlier this year, American Express Token Service offers the following features: (i) a token vault to store and map tokens to card account numbers; (ii) the ability to issue tokens; (iii) lifecycle management services to create, suspend, resume or delete tokens; (iv) additional fraud and risk management services, such as authorization and payment data validation capabilities, for card-issuing financial institutions.

American Express Token Service is available in the U.S., and international rollout is expected to begin in 2015.

"*We believe our payments network is a tremendous asset to American Express – one that will allow us to offer our customers new features and technologies to meet their evolving spending needs," said Paul Fabara, President, Global Banking and Global Network Business, American Express. "As we move ahead, we are excited to bring these new capabilities to our customers and look forward to continuing to serve them."*

American Express also announced that it has developed network specifications for Host Card Emulation (HCE). American Express' HCE specifications provide its card-issuing partners with additional security options and solutions for payments made with mobile NFC-enabled devices that support Android iOS KitKat. With HCE, card issuers use a secure cloud server to store their customers' card account details, which can be transmitted from the cloud server to an NFC-enabled mobile device and then to a Point-of-Sale terminal in a fast, secure manner. American Express' HCE specifications are available today globally."

(Source: Press release from American Express, available at
http://about.americanexpress.com/news/pr/2014/amex-intros-online-mobile-payment-security.aspx)

2. **An example of business expansion plan disclosure --- *Apple to Invest €1.7 Billion in New European Data Centres***

"*CORK, Ireland, February 23, 2015---Apple today announced a €1.7 billion plan to build and operate two data centres in Europe, each powered by 100 percent renewable energy. The facilities, located in County Galway, Ireland, and Denmark's central Jutland, will power Apple's online services including the iTunes Store, App Store, iMessage, Maps and Siri for customers across Europe.*

"*We are grateful for Apple's continued success in Europe and proud that our investment supports communities across the continent," said Tim Cook, Apple's CEO. "This significant new investment represents Apple's biggest project in Europe to date. We're thrilled to be expanding our operations, creating hundreds of local jobs and introducing some of our most advanced green building designs yet."*

Apple supports nearly 672,000 European jobs, including 530,000 jobs directly related to the development of iOS apps. Since the App Store's debut in 2008, developers across Europe have earned more than €6.6 billion through the worldwide sale of apps.

Apple now directly employs 18,300 people across 19 European countries and has added over

2,000 jobs in the last 12 months alone. Last year, Apple spent more than €7.8 billion with European companies and suppliers helping build Apple products and support operations around the world.

Like all Apple data centres, the new facilities will run entirely on clean, renewable energy sources from day one. Apple will also work with local partners to develop additional renewable energy projects from wind or other sources to provide power in the future. These facilities will have the lowest environmental impact yet for an Apple data centre.

"We believe that innovation is about leaving the world better than we found it, and that the time for tackling climate change is now," said Lisa Jackson, Apple's vice president of Environmental Initiatives. "We're excited to spur green industry growth in Ireland and Denmark and develop energy systems that take advantage of their strong wind resources. Our commitment to environmental responsibility is good for the planet, good for our business and good for the European economy."

The two data centres, each measuring 166,000 square metres, are expected to begin operations in 2017 and include designs with additional benefits for their communities. For the project in Athenry, Ireland, Apple will recover land previously used for growing and harvesting non-native trees and restore native trees to Derrydonnell Forest. The project will also provide an outdoor education space for local schools, as well as a walking trail for the community.

In Viborg, Denmark, Apple will eliminate the need for additional generators by locating the data centre adjacent to one of Denmark's largest electrical substations. The facility is also designed to capture excess heat from equipment inside the facility and conduct it into the district heating system to help warm homes in the neighbouring community.

Apple designs Macs, the best personal computers in the world, along with OS X, iLife, iWork and professional software. Apple leads the digital music revolution with its iPods and iTunes online store. Apple has reinvented the mobile phone with its revolutionary iPhone and App Store, and is defining the future of mobile media and computing devices with iPad."

(Source: Press release from Apple, available at
http://www.apple.com/pr/library/2015/02/23Apple-to-Invest-1-7-Billion-in-New-European-Data-Centres.html)

3. **An example of product information plan disclosure ---** *Tesla Q2 2017 Vehicle Production and Deliveries*

"PALO ALTO, Calif., July 07, 2017 (GLOBE NEWSWIRE) -- In response to questions we have received about the number of customer vehicles in transit at the end of Q2, we are updating our Q2 delivery release to provide this information. This information will continue to be included in all future quarters.

In addition to Q2 deliveries, about 3,500 vehicles were in transit to customers at the end of the quarter. These will be counted as deliveries in Q3 2017.

Tesla (Nasdaq:TSLA) delivered just over 22,000 vehicles in Q2, of which just over 12,000 were Model S and just over 10,000 were Model X. This represents a 53% increase over Q2 2016. Total vehicle deliveries in the first half of 2017 were approximately 47,100.

The major factor affecting Tesla's Q2 deliveries was a severe production shortfall of 100 kWh battery packs, which are made using new technologies on new production lines. The technology challenge grows exponentially with energy density. Until early June, production averaged about 40% below demand. Once this was resolved, June orders and deliveries were strong, ranking as one of the best in Tesla history.

Provided global economic conditions do not worsen considerably, we are confident that combined deliveries of Model S and Model X in the second half of 2017 will likely exceed deliveries in the first half of 2017.

Q2 production totaled 25,708 vehicles, bringing first half 2017 production to 51,126.

We always want our customers to experience the newest versions of Model S and X while their cars are in service, so we added fully loaded, newly built cars to our service loaner fleet. We always want the service loaner Tesla to be *better* than the customer car being serviced. The customer should never suffer for something that is our fault.

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We also finally added a sufficient number of Model X cars to our test drive and display fleet because our stores had been operating with far short of what was needed and, in some cases, none at all. There appears to be substantial untapped sales potential for Model X. It should also be noted that production quality and field reliability of the Model X, for which Tesla has been fairly criticized, have improved dramatically. It is now rare for a newly produced Model X to have initial quality problems.

The first certified production Model 3 that meets all regulatory requirements will be completed this week, with a handover of ~30customer cars at our Fremont factory on July 28. More details to follow soon.

Our delivery count should be viewed as slightly conservative, as we only count a car as delivered if it is transferred to the customer and all paperwork is correct. Final numbers could vary by up to 0.5%. Tesla vehicle deliveries represent only one measure of the company's financial performance and should not be relied on as an indicator of quarterly financial results, which depend on a variety of factors, including the cost of sales, foreign exchange movements and mix of directly leased vehicles."

(Source: Press release from Tesla, available at:
http://ir.tesla.com/releasedetail.cfm?ReleaseID=1032479)

4. **An example of business expansion plan disclosure ---** *Anthem Statement on Individual Market Participation in Nevada*

"Anthem, inc., August 07, 2017 --- *After significant dialogue with state leaders and regulators Anthem Blue Cross Blue Shield has made the difficult decision to revise our rate filing for our 2018 Individual plan offerings in Nevada.*

While we are pleased that some steps have been taken to address the long term challenges all health plans serving the Individual market are facing, the Individual market remains volatile. A stable insurance market is dependent on products that create value for consumers through the broad spreading of risk and a known set of conditions upon which rates can be developed. Today, planning and pricing for ACA-compliant health plans has become increasingly difficult due to a shrinking and deteriorating individual market, as well as continual changes and uncertainty in federal operations, rules and guidance, including cost sharing reduction subsidies and the restoration of taxes on fully insured coverage.

Specifically, Anthem will reduce its 2018 Individual plan offering in Nevada and will only offer an off-exchange catastrophic medical plan statewide. It's important to note, this decision does not affect those who have employer based insurance or individuals enrolled in Medicaid, Medicare or "grandfathered" plans (plans purchased before March 2010).

Our commitment to members has always been to provide greater access to affordable, quality healthcare, and we will continue to advocate solutions that will stabilize the market and allow us to return to a more robust presence in Nevada in the future."

(Source: Press release from Anthem, available at:
https://www.anthem.com/press/nevada/anthem-statement-on-individual-market-participation-in-nevada/)