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STRATEGIC BUNDLING OF GOOD AND BAD NEWS: THE CASE OF VOLUNTARY PATENT DISCLOSURES AND NEGATIVE EARNINGS SURPRISES

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ABSTRACT

Firms enjoy wide discretion in their disclosure of patent-related events, which investors generally view as "good news" announcements. This study examines patent disclosure behavior before earnings announcements in light of managers' incentives to avoid the stock price-related consequences of earnings disappointments. The results suggest that for a sample predominately composed of small-cap, high-tech firms, the likelihood of disclosing a patent strategically before an impending negative earnings surprise announcement increases in the magnitude of the negative earnings surprise. Further, such strategic patent disclosure appears to successfully dampen the market response to the earnings announcement. Overall, the empirical findings suggest that some firms engage in the strategic voluntary disclosure of proprietary information in order to manage their short-term stock prices before a mandatory adverse information event.

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1. Introduction

This study provides evidence on firms' strategic disclosure of non-financial information as a mechanism to preemptively mitigate the negative stock price effects of worse-than-expected earnings announcements. Managers have strong disincentives to missing the market's earnings expectations. They believe that investors punish missed earnings benchmarks to a greater degree than investors reward positive earnings surprises and that the labor market bases its judgment of managerial capability on short-run stock prices (Graham et al., 2004). Declines in stock price also have potential adverse effects on executive compensation, job tenure, the cost of capital, and the probability of class action litigation. Although managers associate various undesirable outcomes with a worse-than-expected earnings announcement, the first order effect of these negative outcomes involves the firm's stock price. I examine whether firms facing an upcoming negative earnings surprise strategically time the release of a proprietary leading indicator, milestones in the U.S. patenting process, so as to mitigate their earnings announcement date (EAD) stock decline.[1]

There is good reason to believe that managers could successfully mitigate the undesirable stock price outcomes associated with negative earnings surprises by disclosing a patent ahead of the EAD. Earnings are largely backward-looking data investors use to help extrapolate future earnings and cash flow potential; by contrast, investors can apply a credible leading indicator directly to future earnings potential. Therefore, a firm's patent disclosure could reduce the information content of its forthcoming earnings announcement, which would affect how investors react to the earning announcement.[2] Managers themselves report that a bullish leading

[1] Throughout this paper, I use the word "strategic" in a narrow sense to specifically mean announcing a patent announcement before a negative earnings surprise.

[2] As an example of a leading indicator announcement reducing the information content of an earnings announcement, one could envision a toothpaste manufacturer with a forthcoming earnings disappointment. The

indicator can offset a bad earnings announcement. Based on surveys and interviews of chief financial officers centered on the economic implications of corporate reporting, Graham et al. (2004) find that CFOs believe the market tempers its response to an EPS miss if "the firm's non-financial leading indicators suggest good performance, thereby implying good future earnings" (p. 14). Moreover, the market tends to reward patent event announcements (Erturk et al., 2004)[3], thus providing a stock price "cushion" for a forthcoming negative earning surprise by immediately boosting the announcing firm's stock price. If sufficiently high, a positive stock price reaction to a patent announcement could materially mitigate the percentage change in stock price associated with the forthcoming earnings announcement. Hence, the release of a positive leading indicator has the potential to dampen the stock price impact of a negative earnings surprise either by altering investors' expectations of future earnings or by making the valuation consequences of the bad earnings news a relatively smaller portion of the firm's market capitalization.

Preempting bad earnings with a good news disclosure is, of course, possible only when a firm possesses a reserve of valuable news. At any given time, however, managers presumably already have disclosed all information where the benefit of disclosure outweighed the associated cost. Therefore, the decision to disclose a leading indicator strategically should stem from a manager's analysis of the changing costs and benefits of the voluntary disclosure. Leading indicators may be costly to disclose for competitive reasons and would usually remain a trade secret for at least several months if not voluntarily disclosed. The expected negative stock price

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manufacturer announces that it expects a patent to be issued soon that provides an incremental improvement in its present toothpaste product lines. If investors perceive that the toothpaste patent will maintain or even increase future market share or profitability, they may react less negatively to the bad earnings news since they see the present (bad) earnings as temporary.

[3] Erturk et al. (2004) find that the average event day abnormal return to patent announcements is 3.7%, significant at the 1% level.

effects of a forthcoming negative earnings surprise may increase the (stock price related) benefit of a patent announcement, inducing a firm to announce the patent earlier than it otherwise would and thereby to incur the proprietary cost of disclosure.[4] Verrecchia (1983, 2001), Dye (1986), and Darrough and Stoughton (1990) contend that early disclosure can involve proprietary costs because competitors, along with investors, observe the disclosed information.

Approximately one third of the Graham et al. (2004) survey respondents admit to trying to package bad news releases with other disclosures (p. 33). Wasley and Wu (2005) find evidence suggestive of some firms voluntarily disclosing "good" cash flow forecasts when forthcoming earnings are expected to be poor. Thus, managers behave as though there is a benefit in coordinating the release of "good" and "bad" information events. This study contributes to the voluntary disclosure literature by documenting managers' strategic timing of a leading indicator disclosure before a negative earnings surprise. Moreover, this study provides evidence of the efficacy of strategic bundling at mitigating the stock price effect of a negative earnings surprise.

Several characteristics of patent announcements make them a choice setting for a powerful and focused test of a firm's strategic voluntary disclosure. Prior literature shows that leading indicators in general are related to stock price (Amir and Lev, 1996; Deng et al., 1999; Rajgopal et al., 2003). Patent announcements, in particular, tend to be positive news and a valuable leading indicator, since a patent promises a legal technological monopoly that enables the firm to reap future economic benefits. Patents also credibly signal information about the firm itself, including its research and development productivity. Patent announcements are precise in the amount of information revealed and one can pinpoint their timing, conditions that facilitate the study of the causes and consequences of a disclosure.

[4] Previous research has documented firms incurring real costs to meet earnings benchmarks (c.f., Dechow and Sloan, 1991; Bartov, 1993; and Bushee, 1998).

Moreover, many types of voluntary disclosure tend to be "sticky" and thus costly to discontinue once initiated (Lang and Lundholm, 1993). The announcement of a patent, however, is unlikely to indicate a change in corporate disclosure because of its relative infrequency and unpredictability. Thus, patent announcements may be especially suitable for strategic disclosure purposes.

Using a sample predominately composed of small-cap, high-tech firms, I document that the probability of a patent disclosure with strategic characteristics increases in the magnitude of the negative earnings surprise, where surprise is estimated with a seasonal random walk model. Furthermore, I find evidence that the strategic patent announcement successfully dampens the market reaction to the negative earnings surprise. Given that the disclosure of a patent event may reveal private information to competitors, the study's results suggest that managers may be willing to trade off the costly revelation of proprietary information to avoid short-term stock price declines. While this study focuses on patent events, the empirical findings may generalize to the strategic voluntary disclosure of other leading indicators before negative earnings surprises. The balance of the paper is organized as follows: Section Two describes the patent process and the costs of patent disclosure. Section Three outlines the hypotheses and research design. Section Four presents the empirical results, and Section Five presents the results of the sensitivity analyses. Section Six provides a conclusion.

2. Strategic Disclosure, Proprietary Costs, and the Patent Issuance Process

In the absence of confounding factors, managers would voluntarily announce news of a pending or issued patent at the time when the benefit of disclosure outweighs the associated proprietary cost. This optimal disclosure occasion could be, for example, the launch of a new product using the patent, the beginning of the FDA drug approval process related to the patent, or at such a time to discourage the entry of competitors into the technological arena.

This paper, however, examines whether some firms accelerate their patent disclosures so as to coordinate them with the release of other, adverse information events. Managers may be motivated to "push out" the disclosure of a good leading indicator to dampen the expected stock price drop from a forthcoming negative earnings surprise. While the immediate and broad goal is to mitigate the anticipated stock price drop, the extant literature suggests that managers may be motivated by job security (Healy and Palepu, 2001); litigation risk reduction (Skinner, 1994; Kasznik and Lev, 1995); expectations adjustments (Ajinkya and Gift, 1984; King et al., 1990); managerial talent signaling (Trueman, 1986); and good firm performance signaling (Verrecchia, 1983, 2001; Dye, 1986; and Lev and Penman, 1990). Because the common denominator of these more nuanced motives is managers' attempts to influence their firms' stock prices, I focus on firms' strategic disclosure before negative earnings surprises and on the effectiveness of the strategic disclosure at mitigating the stock price decline.

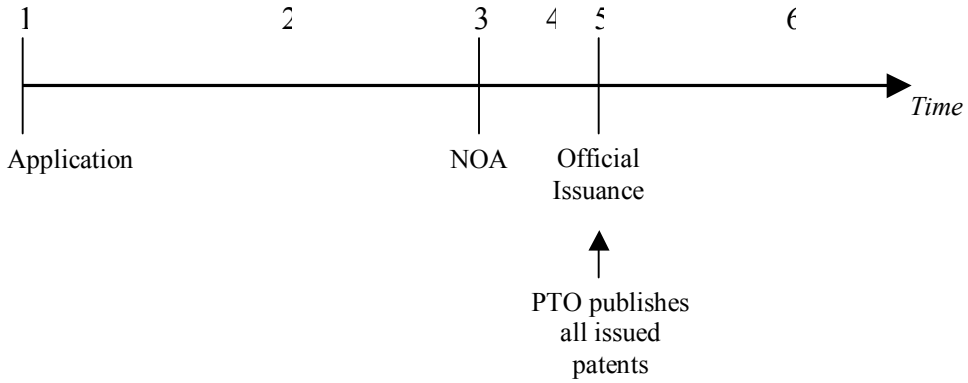
In this study I first identify those patent disclosures with characteristics making them most likely to have been announced "strategically". I do so by examining the type and timing of firms' patent disclosures, as described below.

The patent approval process is lengthy and involves a number of formal steps. The time between applying for and receiving a patent averages approximately 25 months, and can take

more than five years (USPTO 1999 Annual Report). This study focuses on discretionary announcements of three types of patent events: applications, "notices of allowance," and issuances. Disclosure of an *application* indicates only that an application has been submitted to the U.S. Patent and Trademark Office (PTO) and implies nothing about the chances that the application will gain approval. Disclosure of a *notice of allowance* (*NOA*) indicates that the PTO has notified the firm that its patent is near approval. Disclosure of an *issuance* indicates that the PTO has formally bestowed patent protection on a piece of intellectual property. It is important to note that firms enjoy wide discretion as to when to announce a patent event. For example, a company might disclose its application several months after it has applied for the patent. Likewise, many firms choose to make a disclosure of an awarded patent well after the PTO's official issuance. This study's sample is composed of firms' own voluntary patent announcements, not of PTO official patent issuances. Figure 1 depicts a timeline of the sequence of milestones in the patent process.

Figure 1: Timeline Depicting the Sequence of Patent Events and Discretionary Disclosure Opportunities

This diagram illustrates the different stages at which a firm can make a patent announcement, represented by the numbers 1 through 6. The three patent disclosure events studied are application, notice of allowance, and official issuance. The average length of time between application and official issuance was 25 months in 1999 (USPTO Performance and Accountability Report). Firms enjoy wide discretion as to when they can disclose a patent event. Firms can announce an application or NOA immediately (stages 1 and 3), or they can defer the announcement (stages 2 and 4). The actual date of the Patent and Trademark Office (PTO) official issuance is depicted by stage 5. I deem "immediate issuance announcements" as announcements in which firms disclose their issued patent within 14 calendar days of the official PTO issuance (stage 5). Issuance disclosures that firms make after 14 days are deemed "late issuances announcements" (stage 6).



A primary constraint upon any voluntary disclosure is the threat of revealing sensitive information to competitors (Verrecchia, 1983, 2001; Dye, 1986; and Darrough and Stoughton, 1990). During this study's time period, the PTO maintained applications and NOAs in private until issuance.[5] Therefore, a firm announcing a patent application or notice of allowance may enable its competition additional time to "design around" the intellectual property.[6] Announcing a patent application or NOA also entails reputation risk, since the ultimate award of a patent is not assured (though the probability of issuance for an NOA is high). Furthermore, a patent application that the PTO eventually denies could otherwise be maintained as a trade secret if the firm had not already voluntarily disclosed the application. Finally, firms do not have the right to litigate for infringement until the PTO issues a patent.

The competitive costs of revealing a patent *issuance* are less obvious. The PTO publishes the full application of all issued patents in its weekly *Official Gazette*; hence, whether a firm makes its own issuance announcement or not, the fact that it has earned a patent is in the public domain.[7] Because firms enjoy wide discretion in the timing of their patent issuance announcements, a firm can either make its own patent issuance announcement immediately after the PTO publication, or delay the announcement. (A firm may also choose never to make its own issuance announcement.) Erturk et al. (2004) document a 3.5% average event day abnormal return, significant at the 1% level, to firms that announce patents that the PTO issued more than two weeks *earlier*. This market reaction to "old" issuance announcements suggests that these announcements contain information beyond that provided in the PTO publication. An

[5] To harmonize the United States' patent regulations with international norms, Congress passed the American Inventors Protection Act (AIPA) of 1999. As a result, after November 29, 2000, the PTO began publishing patent applications at 18 months from filing. For details, reference http://www.uspto.gov/web/offices/pac/pgpub.htm.
[6] "Designing around" a patent refers to competitors creating a process that serves the same practical function of a patent without infringing on the patent.
[7] Erturk et al. (2004) find evidence that investors monitor the *Official Gazette*.

examination of firms' announcements shows that a majority include the patent's function. In contrast, patents published in the *Official Gazette* do not indicate whether, and commonly do not indicate how, the patent will be used. The new information the market responds to in "old" issuance announcements may provide competitors some degree of proprietary information, which could make the announcement costly for the disclosing firm. In their survey of CFOs, Graham et al. (2004) find that, "CFOs do not want to explicitly reveal sensitive proprietary information 'on a platter' to competitors, even if such information could be partially inferred by competitors from other sources" (p. 32).

Hence, firms announcing *issued* patents could be acting strategically, in that because of an impending earnings announcement, they announce the patent earlier than they otherwise would. In the empirical tests, I define late patent issuance announcements ("late issuances") as those made two weeks or more after their official PTO issuance. Such late issuances are potentially strategic disclosures. I define immediate patent issuance announcements ("immediate issuances") as those patents announced less than two weeks after their official PTO issuance. I expect that the majority of firms making a patent issuance announcement within two weeks are likely coordinating their own issuance announcement with the PTO's official approval, and thus I consider immediate issuance announcements unlikely to be strategic disclosures.[8]

To disclose a patent strategically before a negative earnings surprise, managers clearly must first know that they are going to miss the market's earnings expectation. Firms usually become aware of an impending earnings surprise only toward the end of a quarter (Kasznik and Lev, 1995). Therefore, their option to announce a leading indicator strategically spans approximately the beginning of the third month of a fiscal quarter to the earnings report date. Firms, however,

[8] It is, however, possible that a firm could be issued a patent serendipitously at the precise time it desired to make a strategic disclosure to offset the market reaction to a forthcoming negative earnings surprise.

should be able to recognize with greater confidence that their forthcoming earnings will miss market expectations after the end of the fiscal quarter. As described further in Section 3, I accordingly define the time span in which a strategic patent announcement is likely to occur using windows of two different lengths.

Many investors believe that managers commonly put the best "spin" on poor earnings by adding supplemental information within the text of the earnings announcement (e.g., Coombes, 2005). Lougee and Marquardt (2004) and Schrand and Walther (2000) document firms strategically including information in their earnings announcements to present the firms' performance in the most positive light. This study, however, examines the disclosure of patent events *before* the EAD. Focusing on observations where the strategic leading indicator announcement and earnings announcement occur on separate trading days is novel in that it looks at the coordination, rather than the explicit packaging, of two information events.

Managers have incentives to announce a patent strategically in advance of the earnings announcement. A strategic patent announcement disclosed before the EAD could act as insurance against news of the negative unexpected earnings leaking to the market before the EAD. Leakage could occur as a result of a competitor's financials results being issued in the days preceding the firm's own EAD, enabling investors to more accurately infer the firm's expected earnings. Leakage could also come from other sources, including pre-EAD trading activity. Since managers do not have precise ex ante knowledge of whether and when earnings news will leak to the market, the earlier the strategic patent is announced the greater the protection against disappointing the market's earnings expectations.

Firms also may incur (or fear incurring) increased legal liability under SEC rule 10b-5 from the disclosure of material good news while withholding bad news (Rogers et al., 2004), leading

those firms to disguise their strategic patent announcements by announcing them well in advance of the EAD.[9]

Furthermore, focusing on coordination of disclosures that occur on separate trading days also facilitates a clean empirical assessment of the market's valuation of each announcement. Other settings, where the strategic announcement and the earnings announcement occur on the same day or even simultaneously, would require an analysis of intra-day trading reactions to parse out the market's reaction to each of the two news components, and such intra-day trading measures are difficult to measure accurately.[10]

[9] Rule 10b-5 makes it unlawful "to make any untrue statement of a material fact or to omit to state a material fact necessary to make the statement made, in light of the circumstances under which they were made, not misleading."
[10] The restriction that the patent and earnings announcement occur on separate trading days resulted in only 11 observations being lost, of which only 6 of these 11 observations had negative unexpected earnings.

3. Hypothesis Development and Research Design

The broad purpose of this study is to assess empirically whether managers preempt bad news with a potentially costly good news disclosure. I first test for evidence that firms strategically time patent announcements before negative earnings surprises. I then test if firms are successful in mitigating the EAD stock price decline.

3.1 Categorizing patent disclosures as "strategic" or "non-strategic"

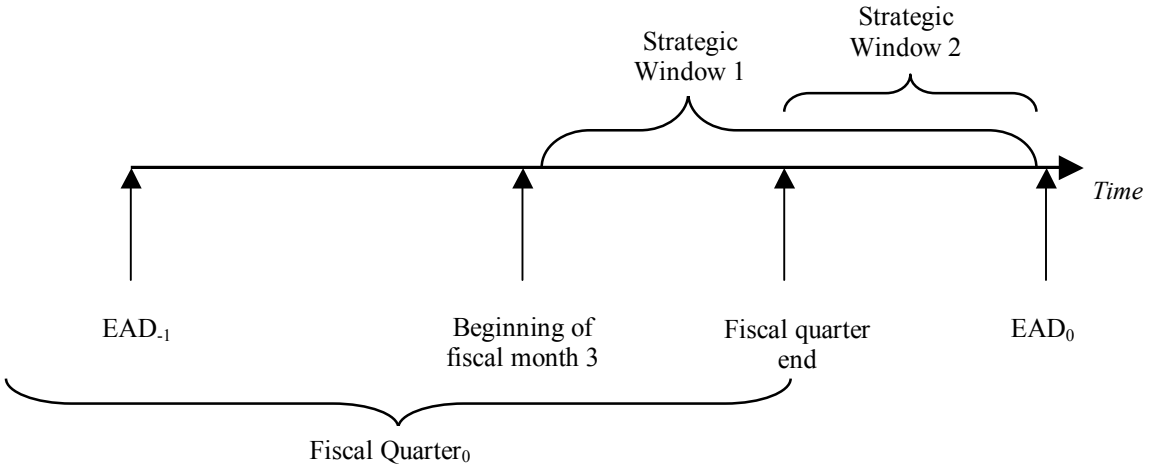
As previously stated, an announcement of a patent application or notice of allowance is likely to be a strategic disclosure because the firm voluntarily releases proprietary information. I also group the announcement of a patent issuance that a firm makes 14 or more calendar days after the PTO approval date (late issuances) as a potential strategic disclosure. Accordingly, I classify application, NOA, and late issuance announcements as strategic *types* of disclosures.

Moreover, I expect that a strategic patent disclosure, as opposed to a non-strategic patent disclosure, would be made in the period just preceding the negative earnings surprise. Though managers exercising strategic disclosure are hypothesized to announce the patent before a worse-than-expected earnings announcement, it is unclear how many days before the EAD firms would make the strategic announcement. Thus, I examine two strategic *periods*. The first is the window from the beginning of the third month in the fiscal quarter to the day before the EAD ("strategic window 1"). The second is the window from the first day after the end of the fiscal quarter to the day before the EAD ("strategic window 2"), a period when managers should have an even stronger indication of how the realized quarterly results compare to market expectations

than in the first period, but one that may miss some well-disguised strategic announcements. Figure 2 depicts the two strategic windows.

Figure 2: Timeline Depicting Identification of Strategic Windows

This figure depicts strategic windows 1 and 2. Though managers exercising strategic disclosure are hypothesized to announce the patent before a worse-than-expected earnings announcement, it is unclear how many days before the EAD firms would make the strategic announcement. Thus, I examine two strategic periods. The first is the window from the beginning of the third month in the fiscal quarter to the day before the EAD. The second is the window from first day after the end of the fiscal quarter to the day before the EAD, a period when managers should have an even stronger indication of how the realized quarterly results compare to market expectations than in the first period, but one that may miss some well-disguised strategic announcements. Applications, notices of allowance, and late issuance announcements are defined as strategic patent types. An observation must lie in the intersection of a strategic *type* and strategic *period* to be defined as a strategic announcement.



An observation must lie in the intersection of a strategic *type* and strategic *period* to be defined as a strategic announcement. The table below illustrates the interaction of the strategic type and period. Observations falling in the upper right quadrant, which is the intersection of the strategic patent type and the strategic patent period, are the patent announcement observations identified as "strategic".

	Beginning of fiscal period to end of 2nd fiscal month (to end of fiscal quarter)	**Beginning of 3rd fiscal month (1st day after fiscal quarter end) to day before earnings announcement date**
Application, NOA, and late issuance announcements	▪ Non-strategic period ▪ Strategic disclosure type	▪ *Strategic period* ▪ *Strategic disclosure type*
Immediate issuance announcements	▪ Non-strategic period ▪ Non-strategic disclosure type	▪ Strategic period ▪ Non-strategic disclosure

3.2 Strategic disclosure choice model

As previously described, managers associate undesirable outcomes with negative earnings surprises. I predict that the propensity for making a strategic patent announcement increases as the size of the earnings disappointment increases. Accordingly,

> H1: Managers' likelihood of making strategic patent announcements increases with the magnitude of the negative earnings surprise.

To test whether a firm is more likely to make a strategic patent disclosure based on its forthcoming earnings announcement, I use a within-firm design that incorporates patent announcements deemed both strategic and non-strategic. The seasonal random walk earnings expectation model serves as the proxy for unexpected earnings, as in Skinner (1994), because of

the paucity of analyst forecasts among small-cap firms.[11] I obtain accounting data and SIC codes from Compustat[12], and stock price data from CRSP. Scaled unexpected earnings are winsorized at the 1st and 99th percentile to reduce the influence of outliers. I compute regression results using both strategic window 1 and 2. I thus estimate the following logistic model:

$$D\_StratObs_i = \alpha_0 + \alpha_1 D\_NegUE_i + \alpha_2 UE_i * D\_NegUE_i + \alpha_3 UE_i * D\_PosUE_i + \alpha_4 LNSIZE_i \quad (1)$$

where

D_StratObs is a binary variable equal to one for strategic observations (application, NOA, and late issuance announcements that are made during the strategic window) and equal to zero otherwise.

UE is the unexpected earnings, computed from a seasonal random walk model using Compustat quarterly data item 9. UE is scaled by the firm's beginning of quarter stock price, obtained from CRSP.

D_NegUE is a binary variable equal to one for negative unexpected earnings and equal to zero for all others.

D_PosUE is a binary variable equal to one for non-negative unexpected earnings and equal to zero for all others.

LNSIZE is the natural log of the firm's market capitalization at five days before the patent announcement.

[11] Graham et al. (2005) find that meeting the same quarter, previous year's earnings number is managers' foremost benchmark goal, even over meeting the analyst consensus forecast. Therefore, the use of SRW in model 1 may be actually more appropriate than using the analyst forecast consensus, since the SRW captures manager's true focus.
[12] SIC membership comes from Compustat annual data item 324, historic SIC, if available. Otherwise, SIC is defined as Compustat's DNUM, current SIC. Kahle and Walkling (1996) demonstrate that Compustat SIC codes are superior to CRSP SIC codes for detecting abnormal performance in industry matching.

Variable	Abbreviation	Coefficient	Prediction
Intercept		α_0	n/a
Dummy for negative scaled seasonal unexpected earnings	D_NegUE	α_1	n/a
Negative scaled seasonal unexpected earnings	UE*D_NegUE	α_2	_
Non-negative scaled seasonal unexpected earnings	UE*D_PosUE	α_3	n/a
Log of market cap	LNSIZE	α_4	n/a

The dummy for negative earnings surprises, D_NegUE, is included to allow for firms with negative unexpected earnings to have a different mean effect than for those with non-negative unexpected earnings. Negative and non-negative unexpected earnings, UE*D_NegUE and UE*D_PosUE, are considered separately because of the differing motives to announce strategically according to the sign of the unexpected earnings. A finding of a significantly negative coefficient on α_2 is consistent with H1. There is no prediction of the sign on α_3 because I do not hypothesize that positive earnings surprises are related to strategic patent disclosure. The log of market capitalization is included as a control variable because firm size may be negatively related to the propensity to disclose strategically.[13]

A pervasive econometric concern is the issue of potential omitted correlated variables. In this study's setting, motives for voluntary disclosure beyond influencing firms' stock prices include insider trading (Bushman and Indjejikian, 1995; Noe, 1999); option grants (Aboody and Kasznik, 2000); capital issuance (Marquardt and Wiedman, 1998; Lang and Lundholm, 2000); information asymmetry and cost of capital (Frankel et al., 1995; Healy et al., 1999). However,

incentives related to inside trading, option grants, and capital issuance are unlikely to motivate managers to announce a (good) patent event before a negative earnings surprise. Managers would be unlikely to sell their shares in the weeks before a negative earnings surprise since their behavior would be readily visible and subject to prosecution for illegal insider sales (Noe, 1999). Likewise, it is improbable that managers would announce good patent news before option awards, since managers would desire a low, not high, strike price. It is also doubtful that managers would have the ability to time a capital issuance after the patent announcement but before the negative earnings surprise, given the short length of that window and the substantial setup time for capital issuance.

Moreover, the relatively short window between the voluntary good news disclosure and the mandatory adverse information event in this study's setting (the period between the patent and earnings announcement averages 37 (25) calendar days in for strategic observations in strategic window 1 (strategic window 2)) reduces the probability of other determinants affecting the decision to announce the patent to change between the two time points.

3.3 ERC mitigation model

Next, I investigate whether conditioning the market with a patent announcement before a negative earnings surprise mitigates the EAD stock price reaction. As previously stated, I conjecture that managers try to reduce the information content of an earnings announcement by signaling the transient nature of the current worse-than-expected earnings with the patent

[13] As an example, Microsoft's large market capitalization may make it less likely for that company to announce a patent strategically, since expected future cash flows associated with even a valuable patent may be small relative to the company's total expected future cash flows. (In essence, the patent is only "a drop in the bucket" relative to the value of the company's project portfolios.) If a patent disclosure is of relatively small importance to investors, the company may be less likely to announce the patent strategically. Moreover, Atiase (1985) documents an inverse relationship between earnings announcement abnormal returns and firm size; if large firms have lower expected absolute EAD returns, they may have less incentive to engage in strategic disclosure around earnings

disclosure, or that managers would at least want to increase their stock price levels before the bad earnings news reaches the market. Accordingly,

> H2: Managers successfully mitigate the earnings announcement-related stock price decline by strategically announcing a patent.

I examine the incremental effect of the patent disclosure on a modified cross-sectional earnings response coefficient (ERC) model. To test for the hypothesized dampening effect on the ERC from announcing the patent before the earnings announcement, a baseline ERC needs to be estimated. Therefore, I use two data points for each sample observation in the regression: one for the quarter *before* the patent announcement ($quarter_{-1}$), the other for the quarter that pertains to the patent announcement ($quarter_0$). This specification permits an analysis of the *incremental* effect of the patent announcement on the ERC in the patent announcement quarter. I estimate the mitigation regression analysis in a stacked format so that strategic and non-strategic patent announcements are considered separately. As in model 1, I compute regression results using both strategic window 1 and 2. Thus, I develop the following OLS model:

$$\begin{aligned} EADret_{it} = \ & D\_StratObs * (\beta_0 + \beta_1 UE_{it} * D\_NegUE_{i0} \\ & + \beta_2 UE_{it} * D\_PosUE_{i0} \\ & + \beta_3 UE_{it} * D\_NegUE_{i0} * D\_StratQtr_{it} \\ & + \beta_4 UE_{it} * D\_PosUE_{i0} * D\_StratQtr_{it}) \\ & D\_NonStratObs * (\gamma_0 + \gamma_1 UE_{it} * D\_NegUE_{i0} \\ & + \gamma_2 UE_{it} * D\_PosUE_{i0} \\ & + \gamma_3 UE_{it} * D\_NegUE_{i0} * D\_StratQtr_{it} \\ & + \gamma_4 UE_{it} * D\_PosUE_{i0} * D\_StratQtr_{it}) + \varepsilon_{it} \quad (2) \end{aligned}$$

where

EADret is the three-day earnings announcement market model abnormal return over trading days -1 to +1, where day 0 is defined as the EAD.

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announcements.

D_StratObs is a binary variable taking a value of 1 when the patent announcement is deemed strategic and equal to zero otherwise.

D_NonStratObs is a binary variable taking a value of 1 when the patent announcement is deemed non-strategic and equal to zero otherwise.

UE is the unexpected earnings in $quarter_t$, where $quarter_0$ is the patent announcement quarter and $quarter_{-1}$ is the quarter before the patent announcement quarter. Unexpected earnings is computed from a seasonal random walk model using Compustat quarterly data item 9 and is scaled by the firm's beginning of quarter stock price, obtained from CRSP.

D_NegUE is a binary variable equal to one for firms with negative unexpected earnings *in the patent announcement quarter* and equal to zero otherwise.

D_PosUE is a binary variable equal to one for firms with non-negative unexpected earnings *in the patent announcement quarter* and equal to zero otherwise.

D_StratQtr is a binary variable equal to one for the quarter of the patent announcement ($quarter_0$) and equal to zero for the quarter before the patent announcement ($quarter_{-1}$).

I use dummy variables to distinguish coefficient estimates based on strategic announcements (D_StratObs) from those based on non-strategic announcements (D_NonStratObs), making the equation equivalent to estimating separate ERC mitigation equations for the strategic and non-strategic observations. Coefficients β_1 and β_2 (γ_1 and γ_2) represent the ERCs in the quarter before the patent announcement for strategic (non-strategic) firm observations, and coefficients β_3 and β_4 (γ_3 and γ_4) represent the incremental effect on the ERCs in the quarter of the patent announcement for strategic (non-strategic) firm observations. The coefficients β_1, β_2, γ_1, and γ_2, are predicted to be positive since they represent the baseline ERC for the negative earnings surprise and the non-negative earnings surprise firms, respectively. A finding of a significantly negative coefficient on β_3 is consistent with H2. The prediction on the coefficient β_4 is double-

sided because the patent announcement could either mitigate the EAD market reaction or actually accentuate the (expected) positive market response to a positive earnings surprise.

However, the above regression specification assumes that ERCs remain constant across industries, which is clearly untrue. Therefore, I empirically implement a better-specified ERC regression that allows ERCs to vary across industries. Observations from the six most frequent SIC codes in the sample are included and the remaining observations are removed. Thus, at a cost of losing some observations and parsimony in the regression specification, the alternative model provides a better-specified ERC. Note that the incremental effect of the patent announcement on the ERC is still interpreted as an average effect:

$$
\begin{aligned}
EADret_{it} = D\_StratObs*(&\beta_0 + \beta_1 UE_{it}*D\_NegUE_{i0} + \beta_2 UE_{it}*D\_PosUE_{i0} \\
&+ \beta_3 UE_{it}*D\_NegUE_{i0}*D\_sic38_i + \beta_4 UE_{it}*D\_PosUE_{i0}*D\_sic38_i \\
&+ \beta_5 UE_{it}*D\_NegUE_{i0}*D\_sic73_i + \beta_6 UE_{it}*D\_PosUE_{i0}*D\_sic73_i \\
&+ \beta_7 UE_{it}*D\_NegUE_{i0}*D\_sic35_i + \beta_8 UE_{it}*D\_PosUE_{i0}*D\_sic35_i \\
&+ \beta_9 UE_{it}*D\_NegUE_{i0}*D\_sic36_i + \beta_{10} UE_{it}*D\_PosUE_{i0}*D\_sic36_i \\
&+ \beta_{11} UE_{it}*D\_NegUE_{i0}*D\_sic87_i + \beta_{12} UE_{it}*D\_PosUE_{i0}*D\_sic87_i \\
&+ \beta_{13} UE_{it}*D\_NegUE_{i0}*D\_StratQtr_{it} \\
&+ \beta_{14} UE_{it}*D\_PosUE_{i0}*D\_StratQtr_{it}) \\
+ D\_NonStratObs * \ (&\beta_0 + \beta_1 UE_{it}*D\_NegUE_{i0} + \beta_2 UE_{it}*D\_PosUE_{i0} \\
&+ \beta_3 UE_{it}*D\_NegUE_{i0}*D\_sic38_i + \beta_4 UE_{it}*D\_PosUE_{i0}*D\_sic38_i \\
&+ \beta_5 UE_{it}*D\_NegUE_{i0}*D\_sic73_i + \beta_6 UE_{it}*D\_PosUE_{i0}*D\_sic73_i \\
&+ \beta_7 UE_{it}*D\_NegUE_{i0}*D\_sic35_i + \beta_8 UE_{it}*D\_PosUE_{i0}*D\_sic35_i \\
&+ \beta_9 UE_{it}*D\_NegUE_{i0}*D\_sic36_i + \beta_{10} UE_{it}*D\_PosUE_{i0}*D\_sic36_i \\
&+ \beta_{11} UE_{it}*D\_NegUE_{i0}*D\_sic87_i + \beta_{12} UE_{it}*D\_PosUE_{i0}*D\_sic87_i \\
&+ \beta_{13} UE_{it}*D\_NegUE_{i0}*D\_StratQtr_{it} \\
&+ \beta_{14} UE_{it}*D\_PosUE_{i0}*D\_StratQtr_{it}) + \varepsilon_{it} \qquad (3)
\end{aligned}
$$

Variable	Abbreviation	Coefficient	Prediction
Strategic Observations	*D_StratObs**		
Intercept		β_0	n/a
Negative scaled seasonal unexpected earnings	UE*D_NegUE	β_1	+
Non-negative SUE	UE*D_PosUE	β_2	+
ERC interactive industry dummies for negative SUE	UE*D_NegUE* D_sic*X*	β_3, β_5, β_7, β_9, β_{11}	n/a
ERC interactive industry dummies for non-negative SUE	UE*D_PosUE* D_sic*X*	β_4, β_6, β_8, β_{10}, β_{12}	n/a
Incremental effect on negative SUE in patent announcement quarter	UE*D_NegUE* D_StratQtr	β_{13}	–
Incremental effect on non-negative SUE in patent announcement quarter	UE*D_PosUE* D_StratQtr	β_{14}	+/–
Non-Strategic Observations	*D_NonStratObs**		
Intercept		γ_0	n/a
Negative scaled seasonal unexpected earnings (SUE)	UE*D_NegUE	γ_1	+
Non-negative SUE	UE*D_PosUE	γ_2	+
ERC interactive industry dummies for negative SUE	UE*D_NegUE* D_sicX	γ_3, γ_5, γ_7, γ_9, γ_{11}	n/a
ERC interactive industry dummies for non-negative SUE	UE*D_PosUE* D_sicX	γ_4, γ_6, γ_8, γ_{10}, γ_{12}	n/a
Incremental effect on negative SUE in patent announcement quarter	UE*D_NegUE* D_StratQtr	γ_{13}	–
Incremental effect on non-negative SUE in patent announcement quarter	UE*D_PosUE* D_StratQtr	γ_{14}	+/–

As with the original specification of model 2 without the industry interactive coefficients, model 3's β_1, β_2, γ_1 and γ_2 are predicted to be positive, and a finding of a significantly negative coefficient on β_{13} is consistent with H2.

4. Sample Composition and Empirical Results

4.1 Data description

I collect patent disclosure observations using keyword searches of *Dow Jones News Service* (*DJNS*) articles between January, 1990, and November, 2000.[14] In all, I read more than 10,000 articles in order to construct the sample. Articles containing confounding information and announcements of non-U.S. patents are excluded from the sample. The *DJNS* articles nearly always result from a company's press release; therefore, I cross-referenced every *DJNS* article that entered the initial sample with the corresponding press release to ensure accuracy in the article's content, to identify the trading day the patent news reached the market, and to obtain the unique PTO patent identifier, where available. Note that the sample is composed of firms' voluntary announcements of patent events and does not constitute a random sample of all patents.[15] Appendix 1 provides examples of an application, NOA, and issuance press release. The *DJNS* data collection yields 1,977 unique patent announcements with at least 50 trading days' worth of data on CRSP prior to the patent announcement date. For patent issuances, I require that the official date of the PTO issuance be known so that the issuance is identifiable as "immediate" or "late". I further require that each firm makes only one patent disclosure in the

[14] Keyword searches consist of articles containing the word 'patent(s)' along with at least one of the following words: acquire, allow, allowance, apply, application, award, expect, file, get, grant, issue, issuance, obtain, notice, receive, and win (including plural forms and the past tense).

[15] The distribution of the economic value of all issued patents has a very large right-hand side skew, a median value of nearly zero, and a truncation of zero on the left-hand side (Harhoff et al., 1997). In other words, the majority of the universe of patents has little economic value. It is noteworthy that many firms never publicly announce their patenting activities. Since firms are apt to announce only economically significant patents, and further, because the *Dow Jones News Service* is likely to carry only the most important patents, this paper's sample is self-selected for the economically valuable patents.

same quarter because of the difficulty in defining multiple announcements as strategic or non-strategic.[16]

I also require that observations have the following data available on CRSP or Compustat: Four quarters of earnings data are required to compute the seasonal random walk earnings expectation in the patent announcement quarter. The earnings announcement dates for the quarter of the patent announcement and the quarter before are required. The stock price at the beginning of the patent announcement quarter is required to scale unexpected earnings. Revenue is required to be greater than zero over the four quarters preceding the patent announcement to avoid the seasonal earnings expectation from yielding unmeaningful estimates. Firms are required to have a stock price of more than two dollars at five days before the patent announcement to avoid spurious results from extreme scaled unexpected earnings. Patent announcements occurring on the same day as the earnings announcement are explicitly excluded by the research design; however, this restriction resulted in only 11 observations being lost. Table 1 tabulates the data loss. The final sample size is 753, consisting of 89 application announcements, 203 notice of allowance announcements, 264 immediate issuance announcements, and 197 late issuance announcements.

Table 2 presents summary statistics by both strategic window 1 and strategic window 2. Strategic patents in strategic window 1 are defined as application, NOA, and immediate issuance patent announcements that occur in the period between the beginning of the third month of the firm's fiscal quarter and one day before the EAD. All other observations are defined as non-

[16] I exclude the observations where the same firm announces more than one patent observation in the same quarter due to the difficulty of categorizing that firm's disclosure behavior as "strategic" or "non-strategic". (For example, a firm's strategic intent is unclear when it announces a "non-strategic" observation before a "strategic" observation.) As a robustness check, however, I retain one observation for each firm in the cases where the firm makes more than one patent announcement in the same quarter and where the quarter's announcements are either all "strategic" or all "non-strategic" in an attempt to minimize data loss. This procedure results in only 11 (13) observations being

strategic announcements in strategic window 1. Strategic patents in strategic window 2 are defined exactly the same as strategic window 1, expect that the strategic period runs from the day after the end of the firm's fiscal quarter to the day before the EAD.

The summary statistics show that the sample firms tend to be listed on NASDAQ. They also exhibit heavy industry clustering, most particularly in SIC code 28 (Chemicals and Allied Products), which contains 384 firms, and in SIC code 38 (Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks), which includes 120 firms. I find that 334 of 384 firms within SIC 28 have a three-digit SIC of 283, which corresponds to the research and manufacture of pharmaceutical products. Additionally, 77 of 120 firms in SIC 38 have a three-digit SIC of 384, which corresponds to medical instruments and supplies.

retained, leaving 804 (806) observations in strategic window 1 (strategic window 2). All empirical results are empirically unaffected with the inclusion of these observations, and are thus not reported.

Table 1: Data Loss

This table tallies the number observations lost due to data requirements.

	Observations
Beginning	1977
less observations where:	
Unknown date of official PTO patent issuance	364
More than one patent announcement by the same firm within the same quarter	392
Previous 4 quarters of earnings data not available on Compustat	195
Earnings announcement date for either quarter t_{-1} or t_0 unavailable	72
Beginning of quarter stock price unavailable on CRSP	4
Revenue of zero in at least one of previous 4 quarters	92
Firm stock price at 5 days before patent announcement is $2 or less	94
Patent announcement occurs on same date as earnings announcement	11
Usable observations	**753**

Table 2: Descriptive Statistics

This table depicts the sample descriptive statistics. Observations defined as strategic in strategic window 1 are those application, NOA, and immediate issuance patent announcements that are made in the period between the beginning of the third month of the firm's fiscal quarter and the day before the earnings announcement date (EAD). All other observations are defined as non-strategic announcements in strategic window 1. Likewise, observations defined as strategic in strategic window 2 are those application, NOA, and immediate issuance patent announcements that are made in the period between the day after the end of the firm's fiscal quarter and the day before the EAD. All other observations are defined as "non-strategic" in strategic window 2. The frequencies of two-digit SIC codes with at least 20 observations are tabulated, as are the frequencies of three-digit SIC codes with at least 15 observations.

	Total	**Strategic Window 1**		**Strategic Window 2**	
		non-strategic	strategic	non-strategic	strategic
Observations					
Number	753	383	370	553	200
Percent		*51%*	*49%*	*73%*	*27%*
Exchange frequency					
Nasdaq	620	321	299	457	163
AMEX	75	36	39	55	20
NYSE	58	26	32	41	17
Patent type frequency					
Application	89	19	70	52	37
NOA	203	47	156	120	83
Late Issuance	197	53	144	117	80
Imm. Issuance	264	264	0	264	0
Two-digit SIC frequency					
SIC 28	348	201	147	265	83
SIC 38	120	50	70	83	37
SIC 73	67	30	37	53	14
SIC 35	47	24	23	33	14
SIC 36	46	23	23	39	7
SIC 87	29	11	18	18	11
Three-digit SIC frequency					
SIC 283	334	195	139	256	78
SIC 384	77	31	46	50	27
SIC 737	63	28	35	50	13
SIC 382	33	15	18	26	7
SIC 357	27	17	10	20	7
SIC 873	25	10	15	16	9
SIC 366	22	11	11	18	4
SIC 355	17	7	10	12	5
SIC 367	15	6	9	12	3

4.2 Univariate and frequency analysis

Table 3 presents the univariate analysis. Firms making strategic announcements have significantly lower median stock prices than non-strategic firms in strategic window 1, though no statistical evidence of such emerges for strategic window 2. The average firm age, proxied by the number of years of data availability for the firm on CRSP preceding the patent announcement, is only approximately 8 years, and there is no statistical difference in firm age between strategic and non-strategic announcement firms. Also, no statistical difference in average stock prices appears between the strategic and non-strategic firms. The market capitalization of strategic firms is significantly lower in the median than that of non-strategic firms in strategic window 1, but no such evidence exists for strategic window 2.[17]

[17] Although a common convention is that earnings "may not matter" for NASDAQ-listed, start-up, or high growth firms, Graham et al. (2005) find that managers themselves consistently rank earnings as by far the most important performance metric. Graham et al. (2005) find this result to be robust even after managers' rankings are conditioned on their firms' size, growth, exchange listing, etc.

Table 3: Univariate Analysis

This table depicts the univariate analysis. Strategic window 1 and strategic window 2 are as defined in table 2. $Quarter_0$ is the quarter of the patent announcement. Stock price and market capitalization are measured at 5 days before patent announcement. Firm age represents the number of years of data available for the firm on CRSP preceding patent announcement. Market capitalization is reported in thousands of dollars. Patent return is measured over trading days 0 through 1, where day 0 is the date of the patent announcement.

		Strategic Window 1			**Strategic Window 2**		
		non-strategic	strategic		non-strategic	strategic	
Stock price	mean	16.53	14.05	*	15.70	14.25	
	median	*8.88*	*8.13*	**	*8.63*	*8.25*	
Firm age (in years)	mean	8.5	7.6		8.1	7.9	
	median	*5.1*	*5.0*		*4.8*	*5.8*	
Market capitalization	mean	1,264,789	1,075,050		1,208,340	1,069,854	
	median	*138,307*	*100,624*	***	*118,943*	*113,070*	
Scaled unexpected earnings	mean	0.0082	0.0241		0.0246	-0.0077	
	median	*0.0008*	*-0.0001*	***	*0.0006*	*-0.0004*	**
Earnings announcement return	mean	-1.2%	-1.6%		-1.2%	-2.0%	
	median	*-1.0%*	*-1.5%*		*-1.1%*	*-1.6%*	
Patent return	mean	3.4%	3.1%		3.6%	2.5%	
	median	*1.3%*	*1.4%*		*1.3%*	*1.4%*	
Percent with negative unexpected earnings in Qtr_0		45%	50%		46%	51%	
Percent with negative unexpected earnings in Qtr_{-1}		49%	52%		50%	52%	
Percent with negative earnings level in Qtr_0		65%	64%		64%	66%	
Percent with negative earnings level in Qtr_{-1}		68%	64%		66%	65%	

*** Significance difference at the 1% level (2-tailed)
** Significance difference at the 5% level (2-tailed)
* Significance difference at the 10% level (2-tailed)
Median difference p-values reported from the Wilcoxan test.

Median scaled unexpected earnings prove significantly lower in the strategic firms than in the non-strategic firms for both windows, though they are not significantly different in the mean. The difference between the percent of firms with negative unexpected earnings and the percent of firms with negative earnings levels (earnings losses) is insignificant between strategic and non-strategic firms in both windows. Note, however, that well over half of all patent announcement firms are unprofitable in the patent announcing quarter; this may reflect the propensity of small firms to experience negative earnings (Hayn, 1995). The fact that a majority of the sample firms are unprofitable reduces the power of the seasonal earnings model and thus results in additional noise in the estimate of unexpected earnings.

Earnings announcement returns over trading days -1 to +1, where day 0 is defined as the EAD, are negative and insignificantly different between strategic and non-strategic firms. Given that median unexpected earnings are significantly more negative for the strategic firms, the lack of a statistical difference between earnings announcement returns may be consistent with firms successfully dampening the effect of negative unexpected earnings. Patent announcement event day returns are positive and insignificantly different between the strategic and non-strategic firms.

Table 4 reports the frequency of observations by sign of the firm's unexpected earnings in the patent quarter and by whether the firm's patent announcement was deemed "strategic" or "non-strategic." Because I use two different windows to classify whether a patent announcement is strategic, I report the frequencies using both strategic window 1 and strategic window 2.

If the sign of the unexpected earnings alone drives the decision to announce strategically, a disproportionately large number of observations should occur in the strategic observation/negative UE cell. A chi-square test, however, does not reject the null of no

relationship between the variables. Hence, I do not find support that the sign of the unexpected earnings alone drives the decision to announce a patent strategically. However, to the extent that announcing a patent strategically is costly, managers likely only would choose to announce strategically when most necessary; therefore, managers may be reluctant to announce a patent strategically for a relatively small earnings disappointments. The disclosure choice model (model 1), discussed in the next sub-section, specifically tests whether the magnitude of the unexpected earnings surprises influences the decision to announce a patent strategically.

Table 4: Frequency Analysis

This table depicts the frequency of observations in strategic window 1 and strategic window 2 by the sign on the unexpected earnings in the patent announcement quarter and by the whether the patent was classified as "strategic" or "non-strategic". The italicized percent to the right of the frequencies is the abnormal market reaction to the patent announcement measured over trading days 0 through 1, where day 0 is the date of the patent announcement.

Strategic Window 1

Number of observations *abnormal return*

	Non-negative UE		Negative UE	
non-strategic observation	212	*3.6%*	171	*3.1%*
strategic observation	185	*3.8%*	185	*2.4%*
Chi-square p-value	0.14			

Strategic Window 2

Number of observations *abnormal return*

	Non-negative UE		Negative UE	
non-strategic observation	300	*3.8%*	253	*3.3%*
strategic observation	97	*3.5%*	103	*1.4%*
Chi-square p-value	0.16			

4.3 Earnings disappointments and the propensity to announce a patent strategically

Table 5 reports the results for model 1, which estimates the likelihood of managers to announce a patent strategically before a negative earnings surprise. The model's likelihood ratio p-value of <0.0001 (0.0444) in strategic window 1 (strategic window 2) indicates that the independent variables in the regression provide a better fit than the intercept alone, thus making the model significant overall. The p-values associated with each independent variable indicate that UE*D_NegUE and LNSIZE significantly affect the decision to disclose the patent strategically. Specifically, the coefficient on the variable of interest, UE *D_NUE, is -14.95 (-5.85) for strategic window 1 (strategic window 2), which is significant at the 1% (5%) one-tailed level. Thus, consistent with H1, the results indicate that the probability of a strategic patent announcement increases in the magnitude of the negative earnings surprise.

The low explanatory power of the model, with the Nagelkerke R^2 of 3.4% (1.3%) and Somers' D of 0.026 (0.123) in strategic window 1 (strategic window 2) may suggest substantial firm-specific determinants in the disclosure choice.[18] Though the model's predictive power is weak, the significance on two of the independent variables (including the variable of interest) indicates that there is a very low probability that the model's results occurred by chance.

Next, I address the effectiveness of such strategic disclosure in mitigating the stock price response to the earnings announcement.

[18] Nagelkerke (1991) advocates the Nagelkerke R^2, or "max re-scaled R^2" as the most appropriate logistic regression analog to the OLS R^2 because it is designed to be able to vary between 0 and 1. Somers' D measures the overall predictive ability of a logistic regression by computing the surplus of concordant pairs as a percentage of concordant, discordant, and relevant tied pairs of observations.

Table 5: Decision to Announce Patent Strategically

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. I dichotomize unexpected earnings (UE) by the sign on the unexpected earnings.

$$D\_StratObs_i = \alpha_0 + \alpha_1 D\_NegUE_i + \alpha_2 UE_i * D\_NegUE_i + \alpha_3 UE_i * D\_PosUE_i + \alpha_4 LNSIZE_i \quad (1)$$

		Strategic Window 1			**Strategic Window 2**		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	1.44	5.98	0.01	-0.61	0.86	0.35
D_NegUE	n/a	-0.08	0.21	0.65	0.05	0.06	0.80
UE*D_NegUE	−	-14.95	7.13	0.00	-5.85	4.04	0.02
UE*D_PosUE	n/a	0.11	0.01	0.93	-1.49	0.60	0.44
LNSIZE	n/a	-0.13	7.46	0.01	-0.04	0.55	0.46
Likelihood Ratio p-value				<0.0001			0.0444
Nagelkerke R^2				0.034			0.013
Somers' D				0.206			0.123
% Concordant				59.8			54.9
% Discordant				39.2			42.7
% Tied				0.9			2.4
# strategic observations				370			200
# non-strategic observations				383			553

D_StratObs is a binary variable equal to one for strategic observations (application, NOA, and late issuance announcements that are made during the strategic window) and equal to zero otherwise.

UE is the unexpected earnings, computed from a seasonal random walk model using Compustat quarterly data item 9. UE is scaled by the firm's beginning of quarter stock price, obtained from CRSP.

D_NegUE is a binary variable equal to one for negative unexpected earnings and equal to zero for all others.

D_PosUE is a binary variable equal to one for non-negative unexpected earnings and equal to zero for all others.

LNSIZE is the natural log of the firm's market capitalization at five days before the patent announcement.

4.4 Strategic disclosure's effectiveness at mitigating the EAD stock price reaction

Table 6 reports the results for model 3, which estimates the mitigation effect on the ERC from announcing a patent strategically. To estimate industry-specific ERCs, I include only those observations from the six two-digit SIC codes with the highest number of observations. Observations that come from other industries are dropped, eliminating 96 observations. Additionally, 21 observations are lost because of an unavailability of additional required data for model 3 in CRSP or Compustat.[19] Furthermore, since the market reaction to the earnings announcement is measured over trading days -1 to +1, where day 0 is defined as the EAD, 8 patent announcements made one trading day before the EAD are excluded to prevent overlap between the patent and earnings announcement return measurements. The final number of observations remaining in the sample is 628.

For strategic window 1, the coefficient on UE*D_NUE*D_StratObs, which represents the baseline ERC for strategic firms with a negative earnings surprise in the quarter before the patent announcement, is 0.73, which is significant at the 1% one-tailed level. The baseline ERC for strategic firms with a non-negative earnings surprise in the patent announcement quarter is 0.36, insignificantly different from zero. The strategic firms' interactive industry dummies for SIC codes 38, 73, 35, 36, and 87 are generally insignificantly different from zero. Consistent with H2, I find that the strategic disclosure of a patent event significantly dampens the ERC. The coefficient on UE*D_NUE*D_StratQtr*D_StratObs, which represents the average mitigation on the ERC in the patent announcing quarter for strategic firms with a negative earnings surprise, is

-0.76, which is significant at the 1% level. The incremental effect on the ERC for a strategic firm with a positive earnings surprise is -0.43, which is insignificant.

I estimate model 3 in a stacked form so that non-strategic coefficients can be estimated for comparison purposes. For non-strategic firms, the coefficient on UE*D_NUE*D_NonStratObs, which represents the baseline ERC for non-strategic firms with a negative earnings surprise in the quarter before the patent announcement, is -0.26, which is insignificantly different from zero. The baseline ERC for non-strategic firms with a non-negative earnings surprise in the patent announcement quarter is 0.43, significantly at the 5% level. As with the strategic firms, the non-strategic firms' interactive industry dummies for SIC codes 38, 73, 35, 36, and 87 are generally insignificantly different from zero. I do not find that the non-strategic disclosure of a patent event significantly dampens the ERC for negative earnings surprises, though it does significantly mitigate the market reaction to positive earnings surprises.

The estimation results to model 3 using strategic window 2 are qualitatively similar, with the primary difference being that the significance on the coefficients on the baseline ERC and the ERC mitigation effect for strategic negative earnings surprise firms, UE_t*D_NegUE*D_StratObs and UE_t*D_NegUE*D_StratQtr*D_StratObs, respectively, both drop to 5% from 1%.[20]

Therefore, it appears that managers successfully dampen the market reaction to earnings disappointments through the strategic disclosure of patent events. Moreover, there is not strong

[19] The specific reasons for the additional data loss in model 3 include a stock price at the beginning of the quarter before the patent announcement quarter is unavailable: 14; the EPS at five quarters before the patent announcement quarter (used to compute the seasonal earnings expectation in the quarter before the patent announcement) is unavailable: 2; revenue is not greater than zero at five quarters before patent announcement quarter: 4; and an earnings announcement period stock return is unavailable for the quarter before the patent announcement quarter: 1.

[20] I also estimate the simplified version of model 3, which constrains the baseline ERCs to be the same across industries ($EADret_{it} = \beta_0 + \beta_1 UE_{it}*D\_NegUE_{i0} + \beta_2 UE_{it}*D\_PosUE_{i0} + \beta_3 UE_{it}*D\_NegUE_{i0}*D\_StratQtr_{it} + \beta_4 UE_{it}*D\_PosUE_{i0}*D\_StratQtr_{it} + \varepsilon_{it}$). Results are comparable: in strategic window 1 (strategic window 2), coefficient estimate UE_{it}*D_NegUE$_{i0}$ is -0.51 (-0.48), which is significant at the 1% (10%) level. The coefficient estimate UE_{it}*D_PosUE$_{i0}$ is -0.41 (-0.10), which is significant at the 5% level (insignificant).

evidence of a significant change to the market reaction to a positive surprise earnings announcement from announcing a strategic patent.

An F-test finds that the mitigation for negative earnings surprises is significantly different between strategic and non-strategic observations in window 1 at the 5% level, but there is no statistical difference for window 2. The finding that strategic patent announcements mitigate negative surprise ERCs while non-strategic announcements do *not* significantly mitigate negative surprise ERCs is consistent with managers purposefully and effectively announcing patents strategically to offset the EAD stock price reaction to negative earnings surprises. [21]

For expositional purposes, table 7 table depicts effective ERCs from Table 6 that apply to each segment of the sample in a fully-crossed format. Because I use two different windows to classify whether a patent announcement is strategic, I report the coefficients using strategic window 1 on the top half of table 7 and the coefficients for strategic window 2 on the bottom half. The left hand side reports results for "strategic observations" and the right hand side reports results for "non-strategic observations". The column heading D_StratQtr=0 denotes the industry ERC in quarter$_{-1}$, while D_StratQtr=1 denotes the ERC in quarter$_0$, the patent announcement quarter. To compute the effective average *baseline* ERC for SIC industry 38 in strategic window 1 for firms that made a *strategic* patent disclosure, for example, one would compute: PosSIC 38 = UE_t*D_PosUE + UE_t*D_PosUE*D_sic38 = 0.36 + -0.06 = 0.30.

Likewise, to compute the effective average ERC in strategic window 1 for firms that made a strategic patent disclosure: Pos SIC 38 = UE_t*D_PosUE + UE_t*D_PosUE*D_sic38 + UE_t*D_PosUE*D_StratQtr = 0.36 + -0.06 -0.43 = -0.13.

[21] An alternative to the cross-sectional ERC model that this study uses is a firm specific, time-series ERC model. In the time-series specification, one calculates an ERC for each firm using time series data, and one computes the fitted market reaction to the firm's earnings announcement and compares it to the actual reaction. A time series ERC model is restricted to firms that have a sufficient time series of earnings and market returns available to form an accurate coefficient estimate. At a minimum, this estimation requires that firms have earnings available on Compustat over the 12 quarters preceding the patent announcement quarter, that return data are available on CRSP for the EAD returns for those 12 quarters, and that only the first patent announcing quarter for firms that announce more than one patent in the sample is used (since the inclusion of the patent announcement quarter is inappropriate for use in the ERC estimation for subsequent patent announcements for the same firm). Using the strategic window definition of a patent announcement occurring between the fiscal quarter end and the day before the EAD, for example, only 49 sample observations are usable. Given that the effect of a patent announcement is predicted to differ according to the sign of the earnings surprise, too few observations remain to perform the analysis. This dearth of usable observations predominately stems from the sample being composed largely of young firms.

Table 6: Mitigation Effect on the ERC

This table depicts stacked OLS estimates of the effect of announcing a patent strategically on the firm ERC. Interactive SIC dummies on the negative and positive unexpected ERC coefficients allow the ERC to vary across industries. The six two-digit SIC codes with the highest number of observations are used, leaving the number of strategic announcers remaining in the sample for strategic window 1 (strategic window 2) at 297 (148).

$$\begin{aligned}EADret_{it} = {} & D\_StratObs*(\beta_0 + \beta_1 UE_{it}*D\_NegUE_{i0} + \beta_2 UE_{it}*D\_PosUE_{i0} + \beta_3 UE_{it}*D\_NegUE_{i0}*D\_sic38_i \\ & + \beta_4 UE_{it}*D\_PosUE_{i0}*D\_sic38_i + \beta_5 UE_{it}*D\_NegUE_{i0}*D\_sic73_i + \beta_6 UE_{it}*D\_PosUE_{i0}*D\_sic73_i \\ & + \beta_7 UE_{it}*D\_NegUE_{i0}*D\_sic35_i + \beta_8 UE_{it}*D\_PosUE_{i0}*D\_sic35_i + \beta_9 UE_{it}*D\_NegUE_{i0}*D\_sic36_i \\ & + \beta_{10} UE_{it}*D\_PosUE_{i0}*D\_sic36_i + \beta_{11} UE_{it}*D\_NegUE_{i0}*D\_sic87_i + \beta_{12} UE_{it}*D\_PosUE_{i0}*D\_sic87_i \\ & + \beta_{13} UE_{it}*D\_NegUE_{i0}*D\_StratQtr_{it} + \beta_{14} UE_{it}*D\_PosUE_{i0}*D\_StratQtr_{it}) \\ & + D\_NonStratObs*(\beta_0 + \beta_1 UE_{it}*D\_NegUE_{i0} + \beta_2 UE_{it}*D\_PosUE_{i0} + \beta_3 UE_{it}*D\_NegUE_{i0}*D\_sic38_i \\ & + \beta_4 UE_{it}*D\_PosUE_{i0}*D\_sic38_i + \beta_5 UE_{it}*D\_NegUE_{i0}*D\_sic73_i + \beta_6 UE_{it}*D\_PosUE_{i0}*D\_sic73_i \\ & + \beta_7 UE_{it}*D\_NegUE_{i0}*D\_sic35_i + \beta_8 UE_{it}*D\_PosUE_{i0}*D\_sic35_i + \beta_9 UE_{it}*D\_NegUE_{i0}*D\_sic36_i \\ & + \beta_{10} UE_{it}*D\_PosUE_{i0}*D\_sic36_i + \beta_{11} UE_{it}*D\_NegUE_{i0}*D\_sic87_i + \beta_{12} UE_{it}*D\_PosUE_{i0}*D\_sic87_i \\ & + \beta_{13} UE_{it}*D\_NegUE_{i0}*D\_StratQtr_{it} + \beta_{14} UE_{it}*D\_PosUE_{i0}*D\_StratQtr_{it}) + \varepsilon_{it} \qquad (2)\end{aligned}$$

Strategic Window 1

		D_StratObs=1			**D_NonStratObs=1**		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.49	0.14	-0.01	-1.21	0.23
Baseline ERCs							
UE_t*D_NegUE	+	0.73	2.69	0.00	-0.26	-0.87	0.81
UE_t*D_PosUE	+	0.36	1.24	0.11	0.43	1.79	0.04
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-0.06	-0.19	0.85	1.11	1.16	0.24
UE_t*D_PosUE*D_sic38	n/a	-0.06	-0.18	0.86	0.82	1.54	0.12
UE_t*D_NegUE*D_sic73	n/a	-0.25	-0.41	0.68	-0.51	-0.83	0.40
UE_t*D_PosUE*D_sic73	n/a	-1.05	-0.88	0.38	1.05	2.37	0.02
UE_t*D_NegUE*D_sic35	n/a	0.82	1.88	0.06	0.53	0.53	0.60
UE_t*D_PosUE*D_sic35	n/a	-0.22	-1.37	0.17	0.28	1.44	0.15
UE_t*D_NegUE*D_sic36	n/a	0.39	0.48	0.63	1.08	0.57	0.57
UE_t*D_PosUE*D_sic36	n/a	0.18	0.29	0.77	0.96	1.68	0.09
UE_t*D_NegUE*D_sic87	n/a	-0.21	-0.27	0.79	3.72	1.40	0.16
UE_t*D_PosUE*D_sic87	n/a	-0.11	-0.17	0.87	-2.04	-3.17	0.00
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.76	-2.58	0.00	0.60	1.05	0.85
UE_t*D_PosUE*D_StratQtr	+/–	-0.43	-1.46	0.14	-0.64	-2.40	0.02
N	1256						
F-stat p-value	<0.0001						
R^2	0.054						
Adjusted R^2	0.030						

Table 6 (continued)

Strategic Window 2

Variable	Predicted Sign	D_StratObs=1 Coefficient	t-stat	p-value	D_NonStratObs=1 Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.00	0.32	-0.01	-1.88	0.06
Baseline ERCs							
UE_t*D_NegUE	+	0.83	1.88	0.03	0.14	0.64	0.26
UE_t*D_PosUE	+	0.34	0.68	0.25	0.33	1.65	0.05
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-1.36	-1.49	0.14	0.27	0.77	0.44
UE_t*D_PosUE*D_sic38	n/a	0.26	0.44	0.66	0.13	0.44	0.66
UE_t*D_NegUE*D_sic73	n/a	2.27	1.61	0.11	-0.70	-1.52	0.13
UE_t*D_PosUE*D_sic73	n/a	-0.54	-0.37	0.72	0.93	2.16	0.03
UE_t*D_NegUE*D_sic35	n/a	1.01	2.16	0.03	-0.11	-0.12	0.90
UE_t*D_PosUE*D_sic35	n/a	-1.20	-0.93	0.35	-0.02	-0.16	0.87
UE_t*D_NegUE*D_sic36	n/a	0.96	0.36	0.72	0.70	0.90	0.37
UE_t*D_PosUE*D_sic36	n/a	0.13	0.05	0.96	0.65	1.50	0.13
UE_t*D_NegUE*D_sic87	n/a	0.05	0.03	0.98	0.56	0.67	0.50
UE_t*D_PosUE*D_sic87	n/a	0.76	0.50	0.62	-1.18	-2.50	0.01
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.94	-1.98	0.02	-0.10	-0.33	0.37
UE_t*D_PosUE*D_StratQtr	+/–	-0.43	-0.84	0.40	-0.45	-2.10	0.04
N	1256						
F-stat p-value	0.0032						
R^2	0.044						
Adjusted R^2	0.020						

$EADret_i$ is the three-day earnings announcement market model abnormal return over trading days -1 to +1, where day 0 is defined as the EAD.

D_StratObs is a binary variable taking a value of 1 when the patent announcement is deemed strategic and equal to zero otherwise.

D_NonStratObs is a binary variable taking a value of 1 when the patent announcement is deemed non-strategic and equal to zero otherwise.

Table 6 (continued)

UE is the unexpected earnings in $quarter_t$, where $quarter_0$ is the patent announcement quarter and $quarter_{-1}$ is the quarter before the patent announcement quarter. Unexpected earnings is computed from a seasonal random walk model using Compustat quarterly data item 9 and is scaled by the firm's beginning of quarter stock price, obtained from CRSP.

D_NegUE is a binary variable equal to one for firms with negative unexpected earnings *in the patent announcement quarter* and equal to zero otherwise.

D_PosUE is a binary variable equal to one for firms with non-negative unexpected earnings *in the patent announcement quarter* and equal to zero otherwise.

D_StratQtr is a binary variable equal to one for the quarter of the patent announcement ($quarter_t$) and equal to zero for the quarter before the patent announcement ($quarter_{-1}$).

D_sic*XX* is a binary variable equal to one when the announcing firm's two-digit SIC code is from that industry and equal to zero for all others.

All other variables are as defined in Table 5.

Table 7: Effective ERCs from Mitigation Model

This table shows effective ERCs from Table 6 that apply to each segment of the sample for strategic window 1 and strategic window 2 in a fully-crossed format. The left hand side reports "strategic observations" and the right hand side reports "non-strategic observations". D_StratQtr=0 reflects the effective industry ERC in quarter$_{-1}$ and D_StratQtr=1 reflects the effective ERC in quarter$_0$, the patent announcement quarter.

Strategic Window 1

Strategic Observations (D_StratObs=1)

Industry	D_Strat Qtr=0	*p-value (one-tailed)*	D_Strat Qtr=1	*p-value (two-tailed)*
Neg baseline	0.73	*0.00*	-0.03	*0.87*
Pos baseline	0.36	*0.11*	-0.07	*0.56*
Neg SIC 38	0.67	*0.03*	-0.09	*0.76*
Pos SIC 38	0.30	*0.15*	-0.13	*0.69*
Neg SIC 73	0.48	*0.21*	-0.28	*0.65*
Pos SIC 73	-0.69	*0.72*	-1.12	*0.34*
Neg SIC 35	1.55	*0.00*	0.79	*0.05*
Pos SIC 35	0.14	*0.33*	-0.29	*0.00*
Neg SIC 36	1.12	*0.08*	0.36	*0.65*
Pos SIC 36	0.54	*0.17*	0.11	*0.86*
Neg SIC 87	0.52	*0.25*	-0.24	*0.76*
Pos SIC 87	0.25	*0.35*	-0.18	*0.77*

Non-Strategic Observations (D_NonStratObs=1)

Industry	D_Strat Qtr=0	*p-value (one-tailed)*	D_Strat Qtr=1	*p-value (two-tailed)*
Neg baseline	0.43	*0.04*	-0.22	*0.16*
Pos baseline	-0.26	*0.38*	0.34	*0.53*
Neg SIC 38	0.85	*0.18*	1.44	*0.14*
Pos SIC 38	1.25	*0.01*	0.61	*0.25*
Neg SIC 73	-0.77	*0.92*	-0.18	*0.81*
Pos SIC 73	1.48	*0.00*	0.83	*0.06*
Neg SIC 35	0.27	*0.39*	0.86	*0.41*
Pos SIC 35	0.71	*0.01*	0.06	*0.60*
Neg SIC 36	0.82	*0.33*	1.42	*0.45*
Pos SIC 36	1.39	*0.01*	0.75	*0.20*
Neg SIC 87	3.46	*0.10*	4.06	*0.12*
Pos SIC 87	-1.62	*1.00*	-2.26	*0.00*

Strategic Window 2

Strategic Observations (D_StratObs=1)

Industry	D_Strat Qtr=0	*p-value (one-tailed)*	D_Strat Qtr=1	*p-value (two-tailed)*
Neg baseline	0.83	0.03	-0.11	0.63
Pos baseline	0.34	0.25	-0.09	0.57
Neg SIC 38	-0.53	0.71	-1.47	0.11
Pos SIC 38	0.60	0.18	0.17	0.78
Neg SIC 73	3.10	0.01	2.16	0.13
Pos SIC 73	-0.20	0.55	-0.63	0.67
Neg SIC 35	1.83	0.00	0.90	0.03
Pos SIC 35	-0.86	0.74	-1.29	0.32
Neg SIC 36	1.79	0.25	0.85	0.75
Pos SIC 36	0.47	0.43	0.04	0.99
Neg SIC 87	0.87	0.30	-0.06	0.97
Pos SIC 87	1.10	0.24	0.67	0.66

Non-Strategic Observations (D_NonStratObs=1)

Industry	D_Strat Qtr=0	*p-value (one-tailed)*	D_Strat Qtr=1	*p-value (two-tailed)*
Neg baseline	0.14	0.26	0.05	0.86
Pos baseline	0.33	0.05	-0.12	0.32
Neg SIC 38	0.42	0.12	0.32	0.29
Pos SIC 38	0.46	0.05	0.01	0.97
Neg SIC 73	-0.56	0.90	-0.66	0.17
Pos SIC 73	1.26	0.00	0.81	0.06
Neg SIC 35	0.04	0.48	-0.06	0.95
Pos SIC 35	0.30	0.09	-0.15	0.06
Neg SIC 36	0.85	0.14	0.75	0.33
Pos SIC 36	0.97	0.01	0.52	0.23
Neg SIC 87	0.70	0.19	0.61	0.47
Pos SIC 87	-0.85	0.97	-1.30	0.01

5. Sensitivity Analysis

5.1 Identification of strategic versus non-strategic patents announcements

The two-week cutoff that distinguishes strategic *issuance* announcements from non-strategic *issuance* announcements is an arbitrary selection. Two weeks ought to be on the "long side" of the time necessary to make a press release if a firm simply announces its issuance once it gains PTO approval for the patent. As a robustness check, I shorten the period that distinguishes immediate issuance announcements and late issuance announcements to one week and to three calendar days. Tables 8 and 9 summarize regression results of this sensitivity analysis, and they show that the results to models 1 and 2 remain qualitatively similar.

Table 8: Decision to Announce Patent Strategically with Alternative Immediate- and Late-Issuance Categorization

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. As a robustness check, I shorten the period that distinguishes immediate issuance announcements and late issuance announcements to one week and to three calendar days from the original two-week cut-off.

$$D\_StratObs_i = \alpha_0 + \alpha_1 D\_NegUE_i + \alpha_2 UE_i * D\_NegUE_i + \alpha_3 UE_i * D\_PosUE_i + \alpha_4 LNSIZE_i \quad (1)$$

One-week cut-off

		Strategic Window 1			Strategic Window 2		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	1.68	8.23	0.00	-0.53	0.72	0.40
D_NegUE	n/a	-0.22	1.47	0.23	-0.03	0.03	0.86
UE*D_NegUE	−	-19.70	8.72	0.00	-5.71	3.80	0.05
UE*D_PosUE	n/a	0.08	0.00	0.95	-1.53	0.74	0.39
LNSIZE	n/a	-0.13	6.89	0.01	-0.03	0.25	0.62
Likelihood Ratio p-value				<0.0001			0.091
Pseudo R^2				0.0473			0.0149
% Concordant				59.3			53.1
% Discordant				39.8			43
% Tied				0.9			3.9
# strategic observations				422			233
# non-strategic observations				331			520

Three calendar day cut-off

Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	1.55	6.99	0.01	-0.47	0.59	0.44
D_NegUE	n/a	-0.21	1.29	0.26	0.04	0.05	0.82
UE*D_NegUE	−	-18.50	7.59	0.01	-5.25	3.34	0.07
UE*D_PosUE	n/a	0.05	0.00	0.97	-1.28	0.60	0.44
LNSIZE	n/a	-0.10	4.45	0.03	-0.03	0.26	0.61
Likelihood Ratio p-value				0.0003			0.0975
Pseudo R^2				0.0379			0.0144
% Concordant				58.1			53.6
% Discordant				40.8			43.6
% Tied				1.1			2.8
# strategic observations				451			247
# non-strategic observations				302			506

Table 9: Mitigation Effect on the ERC with Alternative Immediate- and Late-Issuance Categorization

This table depicts estimate of the mitigation effect on the ERC with alternative immediate- and late-issuance categorization. As a robustness check, I shorten the period that distinguishes immediate issuance announcements and late issuance announcements to one week and to three calendar days from the original two-week cut-off.

One-week cut-off, Strategic Window 1

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	0.00	-1.06	0.29	-0.01	-1.84	0.07
Baseline ERCs							
UE_t*D_NegUE	+	0.51	2.08	0.02	-0.15	-0.45	0.67
UE_t*D_PosUE	+	0.36	1.29	0.10	0.42	1.74	0.04
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	0.01	0.02	0.99	1.13	1.15	0.25
UE_t*D_PosUE*D_sic38	n/a	-0.09	-0.29	0.77	0.98	1.79	0.07
UE_t*D_NegUE*D_sic73	n/a	0.48	0.91	0.36	-2.07	-2.78	0.01
UE_t*D_PosUE*D_sic73	n/a	-1.27	-1.12	0.26	1.18	2.64	0.01
UE_t*D_NegUE*D_sic35	n/a	0.88	2.03	0.04	0.37	0.37	0.72
UE_t*D_PosUE*D_sic35	n/a	-0.25	-1.59	0.11	0.35	1.72	0.09
UE_t*D_NegUE*D_sic36	n/a	0.85	1.10	0.27	-1.12	-0.47	0.64
UE_t*D_PosUE*D_sic36	n/a	-0.04	-0.08	0.94	1.55	2.45	0.01
UE_t*D_NegUE*D_sic87	n/a	0.21	0.28	0.78	6.10	1.09	0.27
UE_t*D_PosUE*D_sic87	n/a	-0.50	-0.92	0.36	-2.24	-2.93	0.00
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.52	-1.93	0.03	0.06	0.09	0.54
UE_t*D_PosUE*D_StratQtr	+/–	-0.39	-1.37	0.17	-0.72	-2.62	0.01
N	1256						
F-stat p-value	<0.0001						
R^2	0.062						
Adjusted R^2	0.039						

Table 9 (continued)

One-week cut-off, Strategic Window 2

Variable	Predicted Sign	D_StratObs=1 Coefficient	t-stat	p-value	D_NonStratObs=1 Coefficient	t-stat	p-value
Intercept	n/a	0.00	-0.11	0.92	-0.01	-2.40	0.02
Baseline ERCs							
UE_t*D_NegUE	+	0.72	1.82	0.07	0.16	0.66	0.51
UE_t*D_PosUE	+	0.20	0.43	0.67	0.34	1.71	0.09
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-1.22	-1.34	0.18	0.28	0.79	0.43
UE_t*D_PosUE*D_sic38	n/a	0.17	0.30	0.76	0.15	0.49	0.62
UE_t*D_NegUE*D_sic73	n/a	2.51	1.79	0.07	-0.71	-1.53	0.13
UE_t*D_PosUE*D_sic73	n/a	-0.91	-0.64	0.52	0.99	2.29	0.02
UE_t*D_NegUE*D_sic35	n/a	1.05	2.26	0.02	-0.15	-0.17	0.86
UE_t*D_PosUE*D_sic35	n/a	0.09	0.12	0.91	-0.01	-0.08	0.93
UE_t*D_NegUE*D_sic36	n/a	2.96	1.49	0.14	0.37	0.46	0.64
UE_t*D_PosUE*D_sic36	n/a	-0.99	-0.57	0.57	0.74	1.70	0.09
UE_t*D_NegUE*D_sic87	n/a	1.06	0.74	0.46	0.30	0.35	0.73
UE_t*D_PosUE*D_sic87	n/a	0.69	0.46	0.65	-1.16	-2.47	0.01
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.80	-1.86	0.06	-0.14	-0.47	0.64
UE_t*D_PosUE*D_StratQtr	+/–	-0.26	-0.54	0.59	-0.48	-2.22	0.03
N	1256						
F-stat p-value	0.0013						
R^2	0.046						
Adjusted R^2	0.023						

Table 9 (continued)

Three calendar day cut-off, Strategic Window 1

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	0.00	-1.05	0.29	-0.01	-2.07	0.04
Baseline ERCs							
UE_t*D_NegUE	+	0.45	1.89	0.03	-0.11	-0.30	0.62
UE_t*D_PosUE	+	0.66	2.84	0.00	-0.07	-0.23	0.59
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	0.01	0.03	0.97	1.33	1.29	0.20
UE_t*D_PosUE*D_sic38	n/a	-0.31	-1.06	0.29	2.59	3.24	0.00
UE_t*D_NegUE*D_sic73	n/a	0.50	0.96	0.34	-2.13	-2.83	0.00
UE_t*D_PosUE*D_sic73	n/a	-0.85	-0.93	0.35	1.46	3.13	0.00
UE_t*D_NegUE*D_sic35	n/a	0.88	2.04	0.04	0.32	0.32	0.75
UE_t*D_PosUE*D_sic35	n/a	-0.26	-1.68	0.09	0.34	1.68	0.09
UE_t*D_NegUE*D_sic36	n/a	0.88	1.14	0.25	-1.18	-0.50	0.62
UE_t*D_PosUE*D_sic36	n/a	-0.32	-0.58	0.56	1.90	2.97	0.00
UE_t*D_NegUE*D_sic87	n/a	0.35	0.47	0.64	0.91	0.08	0.93
UE_t*D_PosUE*D_sic87	n/a	-0.60	-1.12	0.26	-1.80	-2.31	0.02
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.47	-1.74	0.04	-0.06	-0.09	0.47
UE_t*D_PosUE*D_StratQtr	+/–	-0.67	-2.78	0.01	-0.23	-0.72	0.47
N	1256						
F-stat p-value	<0.0001						
R^2	0.068						
Adjusted R^2	0.045						

Table 9 (continued)

Three calendar day cut-off, Strategic Window 2

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	0.00	0.12	0.91	-0.01	-2.58	0.01
Baseline ERCs							
UE_t*D_NegUE	+	0.58	1.53	0.06	0.20	0.82	0.21
UE_t*D_PosUE	+	0.80	2.29	0.01	0.14	0.64	0.26
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-1.07	-1.24	0.21	0.29	0.82	0.41
UE_t*D_PosUE*D_sic38	n/a	-0.04	-0.08	0.94	0.29	0.95	0.34
UE_t*D_NegUE*D_sic73	n/a	2.61	1.87	0.06	-0.74	-1.59	0.11
UE_t*D_PosUE*D_sic73	n/a	-1.08	-0.77	0.44	1.10	2.53	0.01
UE_t*D_NegUE*D_sic35	n/a	1.06	2.29	0.02	-0.19	-0.21	0.83
UE_t*D_PosUE*D_sic35	n/a	0.11	0.15	0.88	0.00	0.02	0.98
UE_t*D_NegUE*D_sic36	n/a	3.04	1.53	0.13	0.34	0.42	0.68
UE_t*D_PosUE*D_sic36	n/a	-1.60	-0.93	0.35	0.90	2.04	0.04
UE_t*D_NegUE*D_sic87	n/a	1.48	1.06	0.29	0.14	0.15	0.88
UE_t*D_PosUE*D_sic87	n/a	0.47	0.31	0.76	-1.02	-2.16	0.03
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.65	-1.54	0.06	-0.20	-0.66	0.25
UE_t*D_PosUE*D_StratQtr	+/–	-0.85	-2.28	0.02	-0.29	-1.27	0.20
N	1256						
F-stat p-value	0.0006						
R^2	0.049						
Adjusted R^2	0.025						

As stated in section 2, the proprietary cost of announcing an issued patent tends to be less straightforward than the proprietary cost of announcing an application or NOA. "Late-issuance" patent announcements only release proprietary information to the extent that these deferred disclosures release information beyond the mere fact of the issuance. Therefore, as a further sensitivity check, I re-estimate the strategic disclosure choice model (model 1) with the late issuance announcements removed. Thus, only application and NOA disclosures remain in the sample as strategic announcements, and all remaining issuance announcements are non-strategic, leaving 556 usable observations. This sensitivity analysis, summarized in table 10, reveals qualitatively similar results for strategic window 1, though the significance level on UE*D_NegUE drops to 5% from 1%. However, I find insignificantly negative results for strategic window 2 (p-value of 11.1%).

I also estimate model 3, the mitigation effect on the ERC from announcing a patent strategically, with the late issuance announcements removed, which leaves 460 firm observations (920/2). Table 11 summarizes the results**,** revealing qualitatively similar results for both strategic windows. Therefore, late issuance announcements may have a stronger effect on the decision to disclose a patent strategically than do application and NOA announcements, though the mitigation effect on the ERC is not sensitive to exclusion of late issuance announcements.

Table 10: Decision to Announce Patent Strategically with "Late-Issuance" Observations Removed

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. As a robustness check, the "late-issuance" observations are removed, leaving only application, NOA, and "immediate-issuance" observations.

		Strategic Window 1			**Strategic Window 2**		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	1.91	6.51	0.01	-0.56	0.43	0.51
D_NegUE	n/a	0.06	0.10	0.75	0.07	0.09	0.77
UE*D_NegUE	−	-11.17	3.90	0.05	-4.64	1.49	0.11
UE*D_PosUE	n/a	0.34	0.08	0.78	-0.56	0.10	0.75
LNSIZE	n/a	-0.21	10.79	0.00	-0.07	0.94	0.33
Likelihood Ratio p-value				0.0001			0.4358
Nagelkerke R^2				0.041			0.011
Somers' D				0.248			0.121
% Concordant				62.1			54.9
% Discordant				37.3			42.8
% Tied				0.6			2.3
# strategic observations				226			120
# non-strategic observations				330			436

Table 11: Mitigation Effect on the ERC with "Late-Issuance" Observations Removed

This table depicts estimates of the mitigation effect on the ERC from announcing a patent strategically with "late-issuance" observations removed as a robustness check

Strategic Window 1							
		D_StratObs=1			**D_NonStratObs=1**		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.80	0.07	-0.01	-1.15	0.25
Baseline ERCs							
UE_t*D_NegUE	+	0.88	2.27	0.01	-0.30	-0.94	0.83
UE_t*D_PosUE	+	0.01	0.02	0.49	0.70	2.86	0.00
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-0.12	-0.18	0.86	0.91	0.88	0.38
UE_t*D_PosUE*D_sic38	n/a	0.15	0.34	0.73	0.86	1.68	0.09
UE_t*D_NegUE*D_sic73	n/a	-1.99	-2.01	0.04	-0.37	-0.58	0.56
UE_t*D_PosUE*D_sic73	n/a	-0.69	-0.52	0.60	-0.70	-1.21	0.23
UE_t*D_NegUE*D_sic35	n/a	0.23	0.49	0.63	0.49	0.51	0.61
UE_t*D_PosUE*D_sic35	n/a	-0.12	-0.73	0.47	0.43	2.21	0.03
UE_t*D_NegUE*D_sic36	n/a	1.09	0.76	0.44	5.69	2.68	0.01
UE_t*D_PosUE*D_sic36	n/a	0.49	0.63	0.53	0.79	1.44	0.15
UE_t*D_NegUE*D_sic87	n/a	-0.31	-0.38	0.71	3.74	1.49	0.14
UE_t*D_PosUE*D_sic87	n/a	1.65	1.01	0.31	-1.69	-1.68	0.09
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.84	-2.00	0.02	0.63	1.07	0.86
UE_t*D_PosUE*D_StratQtr	+/–	-0.12	-0.27	0.79	-1.06	-3.81	0.00
N		920					
F-stat p-value		<.0001					
R^2		0.076					
Adjusted R^2		0.045					

Table 11 (continued)

Strategic Window 2

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.19	0.24	-0.01	-1.40	0.16
Baseline ERCs							
UE_t*D_NegUE	+	0.79	1.22	0.11	0.08	0.32	0.37
UE_t*D_PosUE	+	0.57	0.68	0.25	0.48	2.08	0.02
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-0.45	-0.35	0.73	0.70	1.17	0.24
UE_t*D_PosUE*D_sic38	n/a	0.13	0.15	0.88	0.24	0.73	0.47
UE_t*D_NegUE*D_sic73	n/a	1.45	0.52	0.60	-1.10	-2.01	0.04
UE_t*D_PosUE*D_sic73	n/a	-0.13	-0.08	0.94	-0.67	-1.17	0.24
UE_t*D_NegUE*D_sic35	n/a	0.47	0.92	0.36	-0.20	-0.22	0.82
UE_t*D_PosUE*D_sic35	n/a	1.65	0.51	0.61	0.17	1.02	0.31
UE_t*D_NegUE*D_sic36	n/a	8.23	1.10	0.27	2.87	2.39	0.02
UE_t*D_PosUE*D_sic36	n/a	0.31	0.10	0.92	0.62	1.36	0.18
UE_t*D_NegUE*D_sic87	n/a	1.59	0.57	0.57	0.59	0.75	0.46
UE_t*D_PosUE*D_sic87	n/a	1.57	0.19	0.85	-0.73	-0.84	0.40
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.88	-1.30	0.10	0.12	0.36	0.64
UE_t*D_PosUE*D_StratQtr	+/–	-0.68	-0.79	0.43	-0.79	-3.11	0.00
N		920					
F-stat p-value		0.0124					
R^2		0.054					
Adjusted R^2		0.022					

5.2 Correction for potential dependency among observations

The sample's 753 observations come from 452 unique firms. Of these 452 firms, 153 announce more than one patent over the ten-year sample period. To ensure that a lack of independence between multiple observations by the same firm does not inflate the models' test statistics, I re-estimate the regressions after randomly selecting one observation from each multiple announcement firm and discarding the rest. Tables 12 and 13 reveal that the results remain qualitatively similar in models 1 and 2.

Table 12: Decision to Announce Patent Strategically with Only One Observation per Firm

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. As a robustness check, I randomly select one observation from firms that are included in the sample more than once and discard the remaining observations.

		Strategic Window 1			**Strategic Window 2**		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	1.59	5.06	0.02	-0.97	1.47	0.22
D_NegUE	n/a	-0.24	0.99	0.32	0.03	0.02	0.90
UE*D_NegUE	–	-19.95	5.72	0.02	-8.76	4.43	0.04
UE*D_PosUE	n/a	-0.13	0.01	0.93	-7.85	1.81	0.18
LNSIZE	n/a	-0.14	5.48	0.02	-0.01	0.03	0.87
Likelihood Ratio p-value				0.0003			0.0037
Nagelkerke R^2				0.060			0.050
Somers' D				0.237			0.185
% Concordant				61.4			58.5
% Discordant				37.8			40
% Tied				0.8			1.5
# strategic observations				230			117
# non-strategic observations				222			335

Table 13: Mitigation Effect on the ERC with Only One Observation per Firm

This table depicts estimates of the mitigation effect on the ERC from announcing a patent strategically. As a robustness check, I randomly select one observation from firms that are included in the sample more than once and discard the remaining observations.

Strategic Window 1							
		D_StratObs=1			**D_NonStratObs=1**		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-0.87	0.39	-0.01	-1.02	0.31
Baseline ERCs							
UE_t*D_NegUE	+	0.84	1.56	0.06	-0.30	-0.74	0.77
UE_t*D_PosUE	+	0.47	1.20	0.11	0.55	1.73	0.04
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-0.02	-0.05	0.96	0.93	0.74	0.46
UE_t*D_PosUE*D_sic38	n/a	-0.18	-0.34	0.74	1.90	2.23	0.03
UE_t*D_NegUE*D_sic73	n/a	-0.81	-1.08	0.28	-0.57	-0.81	0.42
UE_t*D_PosUE*D_sic73	n/a	-2.18	-1.40	0.16	0.80	1.61	0.11
UE_t*D_NegUE*D_sic35	n/a	0.98	1.98	0.05	1.34	0.97	0.33
UE_t*D_PosUE*D_sic35	n/a	-0.22	-0.93	0.35	-0.03	-0.12	0.91
UE_t*D_NegUE*D_sic36	n/a	0.48	0.47	0.64	3.68	1.44	0.15
UE_t*D_PosUE*D_sic36	n/a	0.06	0.09	0.93	0.95	1.45	0.15
UE_t*D_NegUE*D_sic87	n/a	-0.44	-0.47	0.64	0.70	0.06	0.95
UE_t*D_PosUE*D_sic87	n/a	-0.30	-0.41	0.68	1.44	0.16	0.87
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.93	-1.85	0.03	0.69	0.91	0.82
UE_t*D_PosUE*D_StratQtr	+/–	-0.53	-1.28	0.20	-0.45	-1.22	0.22
N		732					
F-stat p-value		0.0062					
R^2		0.071					
Adjusted R^2		0.031					

Table 13 (continued)

Strategic Window 2

Variable	Predicted Sign	D_StratObs=1 Coefficient	t-stat	p-value	D_NonStratObs=1 Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.12	0.26	-0.01	-1.60	0.11
Baseline ERCs							
UE_t*D_NegUE	+	0.92	0.89	0.19	-0.06	-0.17	0.57
UE_t*D_PosUE	+	0.43	0.48	0.32	0.54	2.10	0.02
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	-2.40	-1.88	0.06	0.60	1.14	0.26
UE_t*D_PosUE*D_sic38	n/a	-0.35	-0.29	0.77	0.40	0.78	0.44
UE_t*D_NegUE*D_sic73	n/a	-0.88	-0.39	0.70	-0.50	-0.87	0.38
UE_t*D_PosUE*D_sic73	n/a	-2.72	-1.12	0.26	0.74	1.57	0.12
UE_t*D_NegUE*D_sic35	n/a	0.96	1.87	0.06	1.16	0.92	0.36
UE_t*D_PosUE*D_sic35	n/a	1.63	0.45	0.66	-0.15	-0.82	0.42
UE_t*D_NegUE*D_sic36	n/a	0.70	0.24	0.81	1.33	1.27	0.20
UE_t*D_PosUE*D_sic36	n/a	-0.25	-0.09	0.93	0.52	1.08	0.28
UE_t*D_NegUE*D_sic87	n/a	-0.60	-0.30	0.76	0.33	0.34	0.74
UE_t*D_PosUE*D_sic87	n/a	0.65	0.07	0.94	-0.34	-0.47	0.64
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-1.03	-1.02	0.15	-0.28	-0.60	0.28
UE_t*D_PosUE*D_StratQtr	+/–	0.54	0.46	0.65	-0.54	-1.88	0.06
N		732					
F-stat p-value		0.1115					
R^2		0.054					
Adjusted R^2		0.014					

Model 3 estimates the mitigation effect on the ERC from announcing a patent strategically using two data points for each observation (one from the quarter before the patent announcement, and the other from the patent announcement quarter itself). I re-estimate model 3 with firm fixed effects to correct for potential lack of independence between the *pairs* of observations for each firm. Table 14 reveals that results are also qualitatively similar with firm fixed effects included.

Table 14: Mitigation Effect on the ERC with Firm Fixed Effects

This table depicts estimates of the mitigation effect on the ERC from announcing a patent strategically. As a robustness check, I add firm fixed effects for each pair of observations for each firm.

Strategic Window 1							
		D_StratObs=1			**D_NonStratObs=1**		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Baseline ERCs							
UE_t*D_NegUE	+	0.66	1.74	0.04	-0.23	-0.48	0.68
UE_t*D_PosUE	+	0.45	1.15	0.13	0.65	2.02	0.02
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	0.24	0.57	0.57	1.80	1.01	0.31
UE_t*D_PosUE*D_sic38	n/a	-0.15	-0.33	0.74	2.13	2.60	0.01
UE_t*D_NegUE*D_sic73	n/a	-1.43	-1.49	0.14	-0.15	-0.18	0.86
UE_t*D_PosUE*D_sic73	n/a	-0.97	-0.61	0.54	0.99	1.40	0.16
UE_t*D_NegUE*D_sic35	n/a	0.48	0.76	0.45	0.36	0.12	0.90
UE_t*D_PosUE*D_sic35	n/a	-0.40	-1.84	0.07	0.46	1.69	0.09
UE_t*D_NegUE*D_sic36	n/a	-3.14	-1.76	0.08	1.48	0.35	0.73
UE_t*D_PosUE*D_sic36	n/a	0.07	0.07	0.95	-2.23	-1.56	0.12
UE_t*D_NegUE*D_sic87	n/a	1.36	0.83	0.41	5.77	1.66	0.10
UE_t*D_PosUE*D_sic87	n/a	-8.20	-6.75	<.0001	-3.08	-2.96	0.00
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-0.80	-1.95	0.03	0.68	0.98	0.84
UE_t*D_PosUE*D_StratQtr	+/–	-0.47	-1.11	0.27	-1.14	-2.90	0.00
(firm fixed effects excluded)							
N		1256					
F-stat p-value		0.0509					
R^2		0.552					

Table 14 (continued)

Strategic Window 2

Variable	Predicted Sign	D_StratObs=1 Coefficient	t-stat	p-value	D_NonStratObs=1 Coefficient	t-stat	p-value
Baseline ERCs							
UE_t*D_NegUE	+	0.85	1.42	0.08	0.10	0.30	0.38
UE_t*D_PosUE	+	0.84	1.27	0.10	0.64	2.41	0.01
Industry controls							
UE_t*D_NegUE*D_sic38	n/a	0.22	0.15	0.88	0.13	0.28	0.78
UE_t*D_PosUE*D_sic38	n/a	0.51	0.43	0.67	0.21	0.52	0.61
UE_t*D_NegUE*D_sic73	n/a	-7.01	-1.55	0.12	-0.65	-1.03	0.30
UE_t*D_PosUE*D_sic73	n/a	-1.60	-0.80	0.42	0.89	1.29	0.20
UE_t*D_NegUE*D_sic35	n/a	0.91	1.34	0.18	-1.92	-0.95	0.34
UE_t*D_PosUE*D_sic35	n/a	-3.99	-1.19	0.23	0.13	0.67	0.50
UE_t*D_NegUE*D_sic36	n/a	-4.45	-0.53	0.60	-2.22	-1.31	0.19
UE_t*D_PosUE*D_sic36	n/a	3.83	0.82	0.41	-0.89	-1.06	0.29
UE_t*D_NegUE*D_sic87	n/a	3.03	0.49	0.62	2.73	1.79	0.07
UE_t*D_PosUE*D_sic87	n/a	1.58	0.45	0.65	-5.27	-6.54	<.0001
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-1.27	-2.03	0.02	0.29	0.72	0.24
UE_t*D_PosUE*D_StratQtr	+/–	-0.78	-1.12	0.26	-1.04	-3.36	0.00
(firm fixed effects excluded)							
N		1256					
F-stat p-value		0.133					
R^2		0.542					

5.3 **Information leakage and the ERC mitigation**

An alternative explanation for the observed ERC mitigation among firms that announce a patent strategically and subsequently have a negative earnings surprise is that news of the impending earnings announcement systematically leaks to the market before the EAD. I therefore examine the market returns in the window between the patent and earnings announcements for negative earnings surprise firms that announce a patent strategically. In untabulated analysis, I find that the average abnormal return from two trading days after the patent announcement to two trading days before the earnings announcement is -3.7% (-3.1%) for strategic window 1 (strategic window 2), which is not significantly different from zero at the 10% level. Hence, I do not find evidence that firms with negative earnings surprises systematically leak news about the impending earnings announcement before the EAD.

5.4 **Using analyst forecasts to estimate unexpected earnings**

As stated previously, I estimate unexpected earnings using the seasonal random walk model due to the dearth of analyst forecasts available for this study's sample, which principally contains small-cap, young, and high-tech firms. I find that analyst earnings forecasts made 30 or fewer days (90 or fewer days) before the earnings announcement date are available on IBES for only 192 (380) observations, or 25.5% (50.5%) of the total sample. Consistent with the fact that larger and more established firms have a greater presence on IBES, I find that 91% of the NYSE-listed sample firms have an IBES forecast made 90 or fewer days before the EAD, while only 47% of NASDAQ- and AMEX-listed firms have IBES data are available. Moreover, the market

capitalizations of sample firms with IBES forecast availability is over five times that of the sample firms without analyst forecast data.

The advantage of using analyst forecasts to estimate unexpected earnings is that IBES data may better capture market earnings expectations and thus result in lower measurement error. The disadvantage, particularly for this study, however, is the greatly reduced sample size and the systematically different composition of the IBES firms. If the sample firms without analyst forecasts tend to be the firms most likely to announce a patent strategically, the firms with analyst forecast coverage would exhibit a weaker relationship between the magnitude of the negative earnings surprise and the propensity to announce a patent strategically. Thus, the analyst forecast results should be interpreted with caution.

As a sensitivity analysis, I re-estimate model 1 using the median IBES forecast made 90 or fewer days before the EAD. I use the most recent forecast in instances where more than one forecast is available from a given analyst. As summarized in table 15, for the strategic disclosure choice regression, I find an insignificant coefficient on D_NUE*UE in strategic window 1, but a significantly negative coefficient in strategic window 2.

I also re-estimate model 3 using IBES data. I estimate the simplified ERC mitigation model that does not include industry interactions due to the small sample size. As summarized in table 16, I find a significantly negative coefficient on UE_t*D_NegUE*D_StratQtr for both strategic window 1 and 2, which reflects the change in the ERC for negative earnings firms in the patent announcement quarter. The baseline negative ERC, UE_t*D_NegUE, is insignificantly different from zero in both strategic window, which limits inferences on the patent mitigation effect.

Thus, I find only weak corroborating evidence using analyst forecasts as the proxy for unexpected earnings.

Table 15: Decision to Announce Patent Strategically with Analyst Forecasts

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. As a robustness check, I use IBES forecast errors as the proxy for unexpected earnings, as opposed to a seasonal random walk model.

		Strategic Window 1			**Strategic Window 2**		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	0.49	0.34	0.56	-1.83	3.32	0.07
D_NegUE	n/a	-0.01	0.00	0.96	0.52	3.53	0.06
UE*D_NegUE	–	-11.37	0.90	0.17	-20.30	2.85	0.05
UE*D_PosUE	n/a	16.42	1.79	0.18	23.40	3.94	0.05
LNSIZE	n/a	-0.06	0.81	0.37	0.02	0.10	0.75
Likelihood Ratio p-value				0.3449			0.0191
Nagelkerke R^2				0.016			0.046
Somers' D				0.108			0.208
% Concordant				54.6			59.2
% Discordant				43.8			38.4
% Tied				1.6			2.3
# strategic observations				174			91
# non-strategic observations				206			289

Table 16: Mitigation Effect on the ERC with Analyst Forecasts

This table depicts estimates of the mitigation effect on the ERC from announcing a patent strategically. As a robustness check, I use IBES forecast errors as the proxy for unexpected earnings instead of the seasonal random walk model.

Strategic Window 1

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.73	0.08	0.00	-0.69	0.49
Baseline ERCs							
UE_t*D_NegUE	+	0.33	0.39	0.35	1.36	1.54	0.06
UE_t*D_PosUE	+	0.89	1.20	0.12	1.05	0.72	0.24
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-1.89	-1.65	0.05	-0.40	-0.30	0.38
UE_t*D_PosUE*D_StratQtr	+/–	-0.61	-0.61	0.54	2.53	1.30	0.19
N		564					
F-stat p-value		0.039					
R^2		0.034					
Adjusted R^2		0.016					

Strategic Window 2

		D_StratObs=1			D_NonStratObs=1		
Variable	Predicted Sign	Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-0.57	0.57	-0.01	-1.45	0.15
Baseline ERCs							
UE_t*D_NegUE	+	0.21	0.24	0.41	1.38	1.62	0.05
UE_t*D_PosUE	+	0.26	0.30	0.38	1.88	1.82	0.03
Incremental effect of patent							
UE_t*D_NegUE*D_StratQtr	–	-1.82	-1.49	0.07	-0.84	-0.68	0.25
UE_t*D_PosUE*D_StratQtr	+/–	-0.10	-0.09	0.93	-0.28	-0.21	0.83
N		564					
F-stat p-value		0.119					
R^2		0.027					
Adjusted R^2		0.010					

5.5 **Incremental propensity to announce strategically based on type of patent event**

In post-hoc analysis, I re-estimate the results of model, the disclosure choice regression, including two dummy variables for application and NOA disclosures. D_app (D_noa) takes a value of one if the announcement is a patent application (notice of allowance) and zero otherwise. Table 17 summarizes the results of the expanded regression model. Results suggest that managers are more likely to use applications and NOAs as strategic disclosures.

Table 17: Decision to Announce Patent Strategically with Application and NOA Disclosure Dummies

This table depicts logistic estimates of the decision to announce patent strategically based on the forthcoming earnings surprise. In post-hoc analysis, I include dummy variables for application and NOA disclosures.

		Strategic Window 1			**Strategic Window 2**		
Variable	Predicted Sign	Coefficient	Wald χ^2	p-value	Coefficient	Wald χ^2	p-value
Intercept	n/a	-0.31	0.21	0.65	-1.94	7.77	0.01
D_NegUE	n/a	-0.09	0.19	0.66	0.05	0.08	0.77
UE*D_NegUE	−	-17.02	7.59	0.01	-6.06	4.31	0.04
UE*D_PosUE	n/a	-0.41	0.09	0.76	-1.55	0.80	0.37
LNSIZE	n/a	-0.05	0.85	0.36	0.02	0.19	0.66
D_app	n/a	2.08	54.58	<.0001	1.24	24.32	<.0001
D_noa	n/a	2.00	101.46	<.0001	1.22	39.99	<.0001
Likelihood Ratio p-value				<.0001			<.0001
Nagelkerke R^2				0.281			0.113
Somers' D				0.514			0.347
% Concordant				75			67
% Discordant				24			32
% Tied				1			2
# strategic observations				370			200
# non-strategic observations				383			553

5.6 **Market reaction to strategic versus non-strategic application and NOA announcements**

In post-hoc analysis, I compare the average abnormal return to the application and NOA patent announcement between those made "strategically" and "non- strategically". To the extent that the market foresees the strategic intent of a patent announcement, it would impound both the benefits of the patent event and the increased probability of a forthcoming negative earnings surprise into its reaction to the patent event. Because applications and NOAs disclosures are made before the PTO has approved the patent, these types of patent announcements are inherently "riskier" for managers to make, and, therefore, are perhaps more likely to be strategic announcements. In untabulated results, I find that the average return to *strategic* application and NOA disclosures over trading days t=0 to t=1, where t=0 is the patent announcement date, is 3.98% (4.21%) in strategic window 1 (strategic window 2), compared to 3.03% (1.87%) for applications and NOAs made non-strategically. The difference in means is insignificant (significant at the 10% level). Therefore, there is not strong evidence that the market systematically distinguishing between strategic and non-strategic applications and NOA disclosures.

6. Conclusion

This study finds empirical evidence that managers coordinate the disclosure of two disparate news events. Although many forms of information bundling may exist, I specifically find evidence of strategic patent disclosures before negative earnings surprises. I document that the propensity for a firm to make a patent disclosure before a negative earnings surprise announcement increases in the magnitude of the earnings disappointment. Moreover, I find that a firm announcing a patent strategically successfully mitigates the market response to the disappointing earnings announcement. Hence, the study finds support for the existence and effectiveness of a specific form of information bundling.

An unanswered aspect of the study's results is whether the strategic disclosure of patents is in shareholders' interest. Insomuch as patent announcements are costly due to the revelation of proprietary information, the question of shareholder interest revolves around who benefits from dampening the stock price impact of the negative earnings surprise. It is not clear why investors, who according to capital markets portfolio theory should not price unsystematic risk, would desire that firms sacrifice value to smooth a firm's stock price. Moreover, the Graham et al. (2004) survey concludes that managerial efforts to meet earnings benchmarks are primarily related to managers' own welfare concerns, and Aboody and Kasznik (2000) find evidence of managers making opportunistic disclosures to maximize their stock option compensation. Thus, this study's documented strategic patent disclosure behavior may be a manifestation of an agency problem between managers and investors.

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Appendix A: Sample patent announcements

Example of Issuance Announcement
DepoMed, Inc. Announces Issued Patent for Key Drug Delivery Technology
533 words
1 November 1999
08:29 am
Business Wire
English

FOSTER CITY, Calif.--(BW HealthWire)--Nov. 1, 1999--DepoMed, Inc. (AMEX:DMI) today announced that U.S. Patent No. 5,972,389, covering the controlled-release of "sparingly soluble drugs and insoluble matter from a gastric retentive system," has been issued by the United States Patent and Trademark Office.

Currently, DepoMed is using this technology with its enhanced calcium supplement, DepoCal(TM), in addition to a number of undisclosed products.

"At the present time, it is very difficult to make poorly soluble or insoluble drugs orally available. In our Gastric Retention (GR) System, we have found a unique controlled-release mechanism that makes oral delivery of these poorly absorbed drugs possible," said John W. Shell, Ph.D., chairman and chief scientific officer.

"This patented technology provides the potential for oral delivery of drugs that normally require injection, and is the basis for our approach to oral vaccines. Many of the drugs on the market and in development could benefit from our GR System."

DepoMed's GR System allows drugs to be retained in the stomach for an extended period of time while it delivers the incorporated drug, allowing enhanced absorption of drugs preferentially absorbed in the upper gastrointestinal tract.

Benefits of DepoMed's GR System may include superior absorption of drugs, delivery of more rational drug combinations, targeted delivery, and once-a-day dosing regimens for drugs that are currently taken several times per day.

DepoMed, Inc., a development stage company, is engaged in the development of new and proprietary oral drug delivery systems. In addition to the GR System, it has developed the Reduced Irritation (RI) System, designed to reduce the gastrointestinal irritation that is a side effect of many drugs.

The company's strategy for the research, development, clinical testing, manufacturing and commercialization of products utilizing the DepoMed Systems entails entering into collaborative arrangements with pharmaceutical, biotechnology, and manufacturing companies.

In addition to developing products jointly with other companies, DepoMed is also developing its own line of proprietary products utilizing off-patent and over-the-counter drugs. Additional information may be found at DepoMed's web site: www.depomedinc.com.

The statements in this press release that are not historical facts are forward-looking statements that involve risk and uncertainties, including fluctuations in operating results and risks associated with the development of products, technological changes, FDA and other regulatory approvals, dependence on and need for collaborative partners, competition, uncertainty relating to patent and proprietary rights and other risks identified in the company's report on Form 10-KSB and other filings with the Securities and Exchange Commission. Actual results, events, and performance may differ materially. Readers are cautioned not to place undue relevance on these forward-looking statements, which speak only as of the date hereof. The company expressly disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any change in the company's expectations with regard thereto or any change in events, conditions or circumstances on which any statements are based.

CONTACT: DepoMed, Inc. John Hamilton, 650/513-0990 (VP & CFO) 08:14 EST NOVEMBER 1, 1999

Example of Notice of Allowance Announcement

ISIS RECEIVES NOTICE OF ALLOWANCE FOR PATENT FOR INNOVATIVE HIV COMPOUND

621 words
14 November 1995
07:08 am
PR Newswire
English

CARLSBAD, Calif., Nov. 14 /PRNewswire/ -- Isis Pharmaceuticals, Inc. (Nasdaq: ISIP) announced it has received a notice of allowance for a patent on ISIS 5320, a compound in preclinical development that has been shown in vitro and in vivo to be a potent and specific inhibitor of HIV, the virus that causes AIDS.

ISIS 5320 acts by a novel mechanism to prevent viral replication by binding to the viral envelope and preventing cell-to-cell and virus-to- cell transmission of the virus. When tested in vitro, in the standard assays used by the National Cancer Institute to test anti-HIV compounds, ISIS 5320 was shown to be active against a broad variety of HIV-1 and HIV-2 strains, including both laboratory-derived and clinical isolates as well as drug resistant strains. The compound was also shown not to result in viral resistance after multiple passages of HIV in the presence of ISIS 5320, and to be additive to, or possibly synergistic with, AZT.

ISIS 5320 inhibits HIV viral replication in the SCID-hu mouse model of HIV infection*. In this model, daily subcutaneous injections of ISIS 5320 were shown to inhibit HIV-1 replication. When compared to untreated mice, a statistically significant reduction in viral p24 protein was obtained in experiments using both a molecular clone and a clinical isolate of HIV-1.

"This notice of allowance represents an important addition to Isis' very broad portfolio of product and technology patents and is a timely complement to the product patents issued to Isis earlier this year on ISIS 2922 and ISIS 2105, our two lead compounds in advanced clinical trials," said B. Lynne Parshall, Senior Vice President and Chief Financial Officer. "Isis is considering developing ISIS 5320 with a partner and this notice of allowance adds significantly to the value of the compound. In light of the preclinical data concerning its antiviral activity, we are hopeful that ISIS 5320 will have a significant therapeutic effect against HIV."

ISIS 5320 is currently in preclinical development supported in part with funding from the National Cancer Institute. An IND for this compound is targeted for the second half of 1996. ISIS 5320 is the first development candidate to emerge from the Isis combinatorial chemistry program, Osiris, which uses novel proprietary chemistries to generate libraries of unique small molecule compounds and to identify therapeutically useful compounds within such libraries as potential drug candidates. ISIS 5320 is not designed to be an antisense drug.

Isis Pharmaceuticals, based in northern San Diego County, is engaged in the discovery and development of novel human therapeutic compounds. Isis has three compounds in human clinical trials: ISIS 2922, to treat CMV-induced retinitis in AIDS patients, is in Phase III clinical trials; ISIS 2105, to treat genital warts caused by human papillomavirus, is currently in Phase II clinical trials as an adjunct to surgery; and ISIS 2302, an inhibitor of ICAM-1, is in Phase II trials for renal transplant rejection, rheumatoid arthritis, psoriasis, Crohn's disease and ulcerative colitis. The company also has several additional compounds in preclinical development. Isis' broad medicinal chemistry and biology research programs support efforts in both antisense and combinatorial drug discovery.

*SCID-hu mice are immunodeficient mice that are transplanted with human fetal liver and thymus tissue. HIV-1 is injected into the human graft and effects of antiviral compounds on viral p24 are determined. The SCID-hu mouse model was developed by SyStemix, Inc. and used by the National Institute of Allergy and Infectious Diseases (NIAID) to evaluate compounds exhibiting promising in vitro results against HIV-1.

Yuio./CONTACT: Jane Green, Director, Investor Relations of Isis, 619-603-3880/ 06:00 EST

Document prn0000020011026drbe01t3s

Example of Application Announcement

A.D. Tech Files Patent For Security Device To Thwart Counterfeiting Of Digital Video Discs (Dvds), Compact Discs, Bank Checks And Bank Notes

481 words
3 July 1996
08:15 am
Business Wire
English

TAUNTON, Mass.--(BUSINESS WIRE)--July 3, 1996--A.D. TECH Inc. (Nasdaq:ADTC) announced today it has filed for a patent covering an invention to improve the security and decrease counterfeiting of CDs (compact discs), DVDs (digital video discs), bank checks and bank notes.

"The timing of our new security device couldn't be better," said Glenn J. Walters, president and CEO of A.D. TECH. "For example, music CDs are being illegally copied by the millions. Attempts to stop these counterfeit activities have been very limited. Check and bank notes are two other huge markets, which require cost effective security for anti-counterfeiting purposes.

"Our security device now provides a more compelling anti-counterfeit alternative, because we are able to directly deposit, via a vacuum deposition method, a proprietary coating directly on to the CD or DVD, or the bank check or the bank note for that matter, which creates a unique color-shift, hologram-type graphic. These hologram-type images provide not only a unique graphic signature that distinguishes the genuine article from a counterfeit, but also is extremely difficult to reproduce by would-be counterfeiters. Our technology can also be applied directly to videotape films.

"Our technology is elegantly simple and cost effective," Walters added. "For example, we estimate the cost per disc for applying these holographic images to be less than ten cents. We are investigating business strategies for exploiting this new and timely invention, such as selling CD blanks and/or licensing the technology to equipment manufacturers, who can readily include the cost as part of their standard production process. At the moment, we think licensing fees and a royalty stream for using this technology is the best strategy," said Walters. "Additionally, the market for security devices relating to bank checks and bank notes is one that requires cost-effective solutions heretofore not available. For instance, we estimate this new security device could be applied to bank notes at a price of approximately $5.00 per 1000."

Digital Video Discs (DVDs) are the next-generation of Compact Discs (CDs), with storage capacity of 4.7 gigabytes, or the equivalent of seven standard CD-ROMs. Equipment to play these new-generation discs is expected to be launched this fall, according to the Consumer Electronics Manufacturers Association (CEMA).

A.D. TECH develops and manufactures high-resolution, patterned, vacuum-metallized coatings for a variety of energy-management applications -- including microwave food packaging, authentication holograms, electronic article surveillance tags, electrostatic discharge materials, electronics, and retroreflective films -- using the company's proprietary metallization process including a new Pattern Metallization Printing ("PMP") process.

CONTACT: Glenn Walters A. D. TECH Inc. 508/823-0707 or Ronald Trahan Ronald Trahan Associates Inc. 508/651-1180 08:00 ET JUL 03, 1996

Document bwr0000020011013ds7300yrm

VITA

Benjamin Lansford grew up in Champaign, Illinois. He performed his undergraduate studies at the University of South Carolina, where he earned a B.A. in International Studies *magna cum laude* with honors from the South Carolina Honors College. He then worked for two years in Greenville, South Carolina as a financial accountant for a subsidiary of Fluor Corporation, a multinational engineering and construction company. Benjamin completed his M.B.A. at the University of Pittsburgh where he was awarded the Outstanding Finance Student of the Year award. He earned his Ph.D. in Business Administration with a concentration in accounting at The Pennsylvania State University. Benjamin is currently an assistant professor at Northwestern University's Kellogg School of Management, and lives in Gurnee, Illinois with his wife, Amy, and their son, Clayton.