

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 an 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.

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.¹ Managers themselves report that a bullish leading 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)², 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

¹ 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 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.

² Erturk et al. (2004) find that the average event day abnormal return to patent announcements is 3.7%, significant at the 1% level.

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 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.³ 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.

Prior literature shows that leading indicators are related to stock price (Amir and Lev, 1996; Deng et al., 1999; Rajgopal et al., 2003). Additionally, approximately one third of the Graham et al. (2004) survey respondents admit to trying to package bad news releases with other disclosures (p. 33). This study contributes to the voluntary disclosure literature by examining whether managers, aware of the weight the market places on leading indicators, disclose a leading indicator strategically to mitigate the stock price effect of a negative earnings surprise. To my knowledge, this is the first study to empirically test for the existence and efficacy of a form of strategic bundling of good and bad news.

Several characteristics of patent announcements make them a choice setting for a powerful and focused test of a firm's strategic voluntary disclosure. Patent announcements 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. They also credibly signal information about the firm itself, including its

³ Previous research has documented firms incurring real costs to meet earnings benchmarks (c.f., Dechow and Sloan, 1991; Bartov, 1993; and Bushee, 1998).

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.

Moreover, many types of voluntary disclosure tend to be “sticky” and thus costly to discontinue once initiated (Lang and Lundholm, 1993). For firms not heavily engaged in patenting, however, the announcement of a patent 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. Disclosure, Proprietary Costs, and the Patent Issuance Process

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.

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.⁴ Therefore, a firm announcing a patent application or

⁴ 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>.

notice of allowance may enable its competition additional time to “design around” the intellectual property.⁵ 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.⁶ 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 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

⁵ “Designing around” a patent refers to competitors creating a process that serves the same practical function of a patent without infringing on the patent.

⁶ Erturk et al. (2004) find evidence that investors monitor the *Official Gazette*.

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.⁷

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, 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

⁷ 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.

which a strategic patent announcement is likely to occur using windows of two different lengths.

This study explicitly only 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 facilitates a clean 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.

Managers may have incentives to announce a patent strategically more than just a few days in advance of the earnings announcement. A strategic patent announcement disclosed early enough relative to 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.

Managers may also face constraints to the disclosure of a patent in the days immediately before the EAD. Firms with "earnings quiet periods" may be restricted from

announcing a patent in the period directly preceding the earnings report date.⁸ 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

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.

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

⁸ Frankel et al. define an earnings quiet period as “the interval immediately prior to a company’s earnings announcement during which company officials abstain from commenting on the upcoming earnings release. The period of non-disclosure usually begins immediately prior to the end of the fiscal quarter and ends at the time of the earnings announcement” (p. 6). Earnings quiet periods are self-imposed and are not mandated by the SEC. Frankel et al. (2003) find that among their sample firms with a quiet period, the mean (median) length is 25 (21) days before the earnings announcement.

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.”

hypothesized to announce the patent before a worse-than-expected earnings announcement, it is unclear how many days before the EAD that 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.

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	<ul style="list-style-type: none"> ▪ Non-strategic period ▪ Strategic disclosure type 	<ul style="list-style-type: none"> ▪ <i>Strategic period</i> ▪ <i>Strategic disclosure type</i>
Immediate issuance announcements	<ul style="list-style-type: none"> ▪ Non-strategic period ▪ Non-strategic disclosure type 	<ul style="list-style-type: none"> ▪ Strategic period ▪ Non-strategic disclosure type

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. I obtain accounting data and SIC codes from Compustat¹⁰, 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.

¹⁰ 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.

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

Variable	Abbreviation	Coefficient	Prediction
Intercept		α_0	n/a
Dummy for negative scaled seasonal unexpected earnings	D_NegUE	α_1	n/a
<i>Negative</i> scaled seasonal unexpected earnings	UE*D_NegUE	α_2	–
<i>Non-negative</i> 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.¹¹

¹¹ 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 announcements.

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 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 (quarter₁), the other for the quarter that pertains to the patent announcement (quarter₀). This specification permits an analysis of the *incremental* effect of the patent announcement on the ERC in the patent announcement quarter. Since firms that choose to disclose a patent strategically may have stock prices systematically more sensitive to earnings surprises than firms that announce patents non-strategically, the mitigation regression analysis includes only strategic patent announcements. As in model 1, I compute regression results using both strategic window 1 and 2. Thus, I estimate the following OLS model:

$$\begin{aligned}
EADret_{it} = & \beta_0 + \beta_1 UE_{it} * D_NegUE_{i0} \\
& + \beta_2 UE_{it} * D_PosUE_{i0} \\
& + \beta_3 UE_{it} * D_NegUE_{i0} * D_StratQtr_{it} \\
& + \beta_4 UE_{it} * D_PosUE_{i0} * D_StratQtr_{it} + \varepsilon_{it} \quad (2)
\end{aligned}$$

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.

UE is the unexpected earnings in quarter_t, where quarter₀ 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 (quarter₀) and equal to zero for the quarter before the patent announcement (quarter₋₁).

Variable	Abbreviation	Coefficient	Prediction
Intercept		β_0	n/a
Negative scaled seasonal unexpected earnings	UE*D_NegUE	β_1	+
Non-negative scaled seasonal unexpected earnings	UE*D_PosUE	β_2	+
Incremental effect on negative scaled seasonal UE in patent announcement quarter	UE*D_NegUE* D_StratQtr	β_3	-
Incremental effect on non-negative scaled seasonal UE in patent announcement quarter	UE*D_PosUE* D_StratQtr	β_4	+/-

Coefficients β_1 and β_2 represent the ERCs in the quarter before the patent announcement, and coefficients β_3 and β_4 represent the incremental effect on the ERCs in the quarter of the patent announcement. The coefficients β_1 and β_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 by providing a reinforcing signal about the firm's prospects.

The specification of model 2 assumes that ERCs remain constant across industries, which is clearly untrue. Therefore, I also estimate an alternative specification of the 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:

$$\begin{aligned}
 \text{EADRet}_{it} = & \beta_0 + \beta_1 \text{UE}_{it} * \text{D_NegUE}_{i0} \\
 & + \beta_2 \text{UE}_{it} * \text{D_PosUE}_{i0} \\
 & + \beta_3 \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_sic38}_i \\
 & + \beta_4 \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_sic38}_i \\
 & + \beta_5 \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_sic73}_i \\
 & + \beta_6 \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_sic73}_i \\
 & + \beta_7 \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_sic35}_i \\
 & + \beta_8 \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_sic35}_i \\
 & + \beta_9 \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_sic36}_i \\
 & + \beta_{10} \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_sic36}_i \\
 & + \beta_{11} \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_sic87}_i \\
 & + \beta_{12} \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_sic87}_i \\
 & + \beta_{13} \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_StratQtr}_{it} \\
 & + \beta_{14} \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_StratQtr}_{it} + \varepsilon_{it} \quad (3)
 \end{aligned}$$

As in the specification of model 2, 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, 2000.¹² 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 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.¹³ 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

¹² 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).

¹³ 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.

issuance is identifiable as “immediate” or “late”. I further require that each firm makes only one patent disclosure in the same quarter because of the difficulty in defining multiple announcements as strategic or non-strategic.

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.¹⁴ 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-strategic announcements in strategic window 1. Strategic

¹⁴ Further, only 6 of these 11 observations had negative unexpected earnings.

patents in strategic window 2 are defined exactly the same as strategic window 1, except 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. In untabulated analysis, 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.

4.2 Univariate 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.

Median 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.

4.3 Earnings disappointments and the propensity to announce a patent strategically

Table 4 reports the results for model 1, which estimates the likelihood of managers to announce a patent strategically before a negative earnings surprise. The coefficient on UE *D_NUE for strategic window 1 (strategic window 2) is -14.95 (-5.85), 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. Next, I address the effectiveness of such strategic disclosure in mitigating the stock price response to the earnings announcement.

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

Table 5 reports the results for the model 2, which estimates the mitigation effect on the ERC from announcing a patent strategically. As previously stated, the mitigation regression analysis includes only strategic patent announcements (those firms announcing a strategic patent type in the strategic period). Of the original 370 (200) observations in model 1 identified as strategic observations in strategic window 1 (strategic window 2), 18 (15) observations are lost because of an unavailability of additional required data for model 2 in CRSP or Compustat.¹⁵ 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, 6 (6) patent announcements made one trading day before the EAD are excluded to prevent overlap between the patent and earnings announcement return measurements.

¹⁵ The specific reasons for the additional data loss in model 2 in strategic window 1 (strategic window 2) include a stock price at the beginning of the quarter before the patent announcement quarter is unavailable: 12 (9); 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 (2); revenue is not greater than zero at five quarters before patent announcement quarter: 3 (3); and an earnings announcement period stock return is unavailable for the quarter before the patent announcement quarter: 1 (1).

For strategic window 1, the coefficient on $UE * D_NUE$, which represents the baseline ERC for firms with a negative earnings surprise in the quarter before the patent announcement, is 0.58, which is significant at the 1% one-tailed level. The baseline ERC for firms with a non-negative earnings surprise in the patent announcement quarter is 0.19, but is insignificant. Consistent with H2, I find that the strategic disclosure of a patent event significantly dampens the ERC. The coefficient on $UE * D_NUE * D_StratQtr$, which represents the average mitigation on the ERC in the patent announcing quarter for firms with a negative earnings surprise, is -0.51, which is significant at the 1% level. The incremental effect on the ERC for a firm with a positive earnings surprise is -0.41, which is significant at the 5% level.

The estimation results to model 2 using strategic window 2 are qualitatively similar, with the primary differences being that the significance on the ERC mitigation variable for negative earnings surprise firms drops to the 10% level and the ERC mitigation variable for positive earnings surprise firms becomes insignificant.

Table 6 shows the results of the average mitigation effect on the ERC after relaxing the constraint that the ERCs are the same across industries. I add interactive SIC dummies to the negative and non-negative unexpected ERC coefficients to allow the ERC to vary across industries. I use the six two-digit SIC codes with the highest number of observations, leaving the number of strategic announcements remaining in the sample for strategic window 1 (strategic window 2) at 297 (148). In strategic window 1 (strategic window 2), the average mitigation effect on the negative surprise ERC is -0.60 (-0.77), which is significant at the 1% (5%) level. The incremental effect on the ERC for positive earnings surprise firms estimated to be -0.41 (-0.43), which is insignificant

(insignificant). Thus, I also find evidence consistent with H2 when using industry-specific ERCs.

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 evidence of a significant change to the market reaction to a positive surprise earnings announcement from announcing a strategic patent.¹⁶

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. Untabulated regression results indicate that the results to models 1, 2, and 3 remain qualitatively similar.

¹⁶ 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.

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. As a further sensitivity check, I estimate model 1, the likelihood to announce a patent before a negative earnings surprise, 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. Untabulated analysis 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 2 (model 3), the mitigation effect on the ERC from announcing a patent strategically, with the late issuance announcements removed, which leaves 218 (172) usable observations. Untabulated analysis reveals 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.

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. Untabulated analysis reveals that the results remain qualitatively similar in models 1, 2, and 3.

Models 2 and 3 estimate the mitigation effect on the ERC from announcing a patent strategically using two data points for each observation. I re-estimate the results of models 2 and 3 with firm fixed effects to correct for potential lack of independence between the *pairs* of observations for each firm. Untabulated analysis reveals that results are also qualitatively similar with firm fixed effects included.

5.3 Mitigation effect on the ERC from non-strategic patent announcements

To better understand the mitigation effect on the ERC, model 2 is estimated in a stacked regression form so that the mitigation effect on the ERC can be compared between strategic and non-strategic announcements:

$$\begin{aligned}
 EADRet_{it} = & D_StratObs_i * [\beta_0 + \beta_1 UE_{it} * D_NegUE_{i0} \\
 & + \beta_2 UE_{it} * D_PosUE_{it} \\
 & + \beta_3 UE_{it} * D_NegUE_{i0} * D_StratQtr_{it} \\
 & + \beta_4 UE_{it} * D_PosUE_{i0} * D_StratQtr_{it}] \\
 & + D_NonStratObs_i * [\gamma_0 + \gamma_1 UE_{it} * D_NegUE_{i0} \\
 & + \gamma_2 UE_{it} * D_PosUE_{i0} \\
 & + \gamma_3 UE_{it} * D_NegUE_{i0} * D_NonStratQtr_{it} \\
 & + \gamma_4 UE_{it} * D_PosUE_{i0} * D_NonStratQtr_{it}] \\
 & + \epsilon_{it}
 \end{aligned} \tag{4}$$

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. Results in table 7 indicate that the mitigation of negative earnings surprises is not significantly different from zero for

the *non-strategic* patent announcements. 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 2.¹⁷ 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.

5.4 Distinguishing the information effect from the price effect on the ERC mitigation

As previously stated, the mitigation of the ERC could stem from either the patent announcement reducing the information content of the forthcoming earnings announcement or from the patent announcement creating a stock price “cushion” by immediately boosting the firm’s stock price. In an attempt to identify if either factor dominates the ERC mitigation effect of models 2 and 3, I create a synthesized EAD return in the quarter of the patent announcement that removes the increase in stock price caused by the patent announcement. Specifically, I take the change in the firm’s stock price over the three-day earnings window and divide it by the firm’s stock price at five days before the patent announcement. The resultant synthetic EAD return allows me to test for any ERC mitigation stemming expressly from the information effect.

In untabulated analysis, I find that the mitigation effect for strategic window 1 is qualitatively similar in both models 2 and 3, though the significance levels on the

¹⁷ The reported coefficient estimates in table 7 for strategic observations (β_0 through β_4) differ slightly from the corresponding coefficients reported in table 5. This is due to the scaled unexpected earnings (UE) variable being winsorized on a larger population in table 7.

coefficients representing the mitigation falls to the 10% level from the 5% level. For strategic window 2, however, the coefficient representing the mitigation effects loses significance at the 10% level in models 2 and 3. These mixed results suggest that the patent announcement may mitigate the EAD return through *both* the information and price effects.¹⁸

5.5 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.

6. Conclusion

This study finds empirical evidence that managers coordinate the disclosure of good and bad news events. Although many forms of information bundling may exist, I

¹⁸ I use raw returns, as opposed to abnormal returns, for this analysis because of the difficulty involved in adjusting for risk in the synthetic returns. Not adjusting the returns for risk may reduce the power of the ERC model.

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. Inasmuch 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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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 issuance announcements” (stage 6).

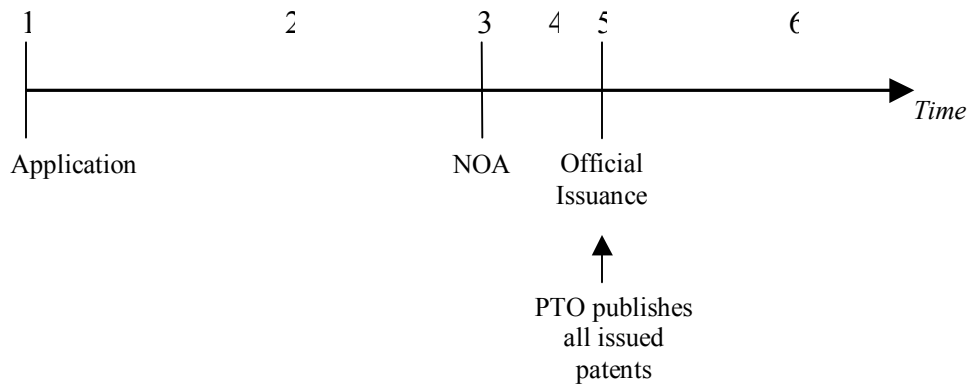


Figure 2: Timeline Depicting Identification of Strategic Windows

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.

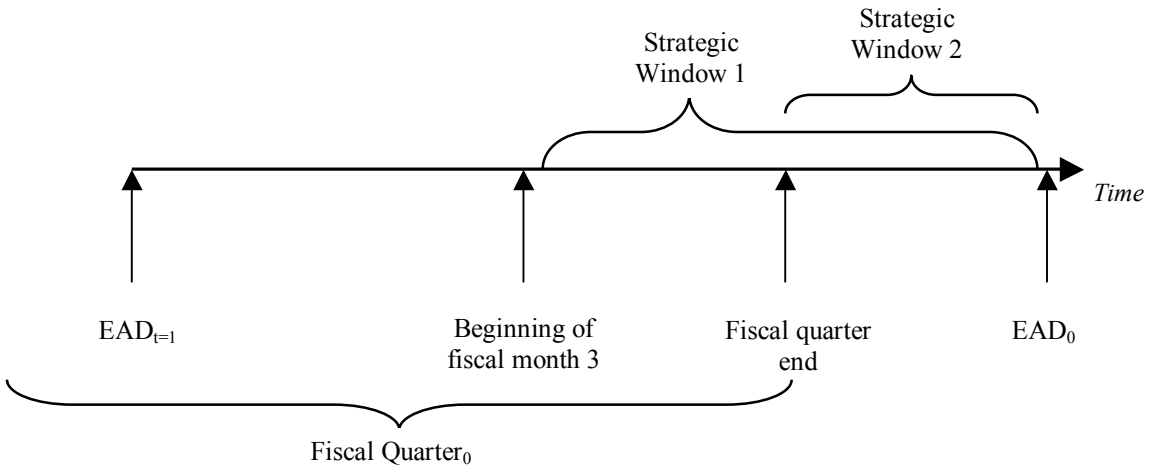


Table 1: Data Loss

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

Observations	
Beginning	1977
<i>less observations where:</i>	
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 $t=0$ or $t=1$ 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.

	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

Table 3: Univariate Analysis

This table depicts the univariate analysis. Strategic window 1 and strategic window 2 are as defined in table 2. Quarter₀ 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 Wilcoxon test.

Table 4: 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.

$$D_StratObs_i = \alpha_0 + \alpha_1 D_NegUE_i + \alpha_2 UE_i * D_NegUE_i + \alpha_3 UE_i * D_PosUE_i + \alpha_4 LNSIZE_i \quad (1)$$

Variable	Predicted Sign	Strategic Window 1			Strategic Window 2		
		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
<i>Likelihood</i>							
<i>Ratio p-value</i>				<.0001			0.0444
<i>Pseudo R²</i>				0.0341			0.0129
<i>% Concordant</i>				59.8			54.9
<i>% Discordant</i>				39.2			42.7
<i>% Tied</i>				0.9			2.4
<i># strategic observations</i>				370			200
<i># non-strategic observations</i>				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.

Table 5: Mitigation Effect on the ERC

This table depicts OLS estimates of the effect of announcing a patent strategically on the firm ERC. Only those patents announcement that are deemed strategic are included in the regression. Each sample firm has two data points, one for the patent announcement quarter (Quarter₀) to estimate a baseline ERC, and another for the quarter before the patent announcement quarter (Quarter₋₁) to estimate the mitigation on the ERC from the patent announcement. I dichotomize unexpected earnings (UE) based on the sign of the unexpected earnings *in the quarter of the patent announcement*, Quarter₀. Because of the additional data requirements and the exclusion of firms that announced a patent one day before the EAD, 23 (21) of model 1's strategic observations are dropped from strategic window 1 (strategic window 2) for this model.

$$\begin{aligned}
 \text{EADret}_{it} = & \beta_0 + \beta_1 \text{UE}_{it} * \text{D_NegUE}_{i0} + \beta_2 \text{UE}_{it} * \text{D_PosUE}_{i0} \\
 & + \beta_3 \text{UE}_{it} * \text{D_NegUE}_{i0} * \text{D_StratQtr}_{it} \\
 & + \beta_4 \text{UE}_{it} * \text{D_PosUE}_{i0} * \text{D_StratQtr}_{it} + \varepsilon_{it}
 \end{aligned} \tag{2}$$

Variable	Predicted Sign	Strategic Window 1			Strategic Window 2		
		Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.61	0.11	-0.01	-1.83	0.07
UE*D_NegUE	+	0.58	3.29	0.00	0.56	2.23	0.01
UE*D_PosUE	+	0.19	1.11	0.13	0.02	0.07	0.47
UE*D_NegUE*D_StratQtr	-	-0.51	-2.25	0.01	-0.48	-1.58	0.06
UE*D_PosUE*D_StratQtr	+/-	-0.41	-2.17	0.03	-0.10	-0.31	0.76
<i>N</i>				692			358
<i>F-stat p-value</i>				0.0005			0.2457
<i>R</i> ²				0.0284			0.0152
<i>Adjusted R</i> ²				0.0227			0.0041

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.

UE is the unexpected earnings in quarter_t, where quarter₀ 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).

Table 6: Mitigation Effect on the ERC (Allowing ERCs to Vary by Industry)

This table depicts 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).

$$\begin{aligned}
 EADret_{it} = & \beta_0 + \beta_1 UE_{it} * D_NegUE_{i0} + \beta_2 UE_{it} * D_PosUE_{i0} \\
 & + \beta_3 UE_{it} * D_NegUE_{i0} * D_sic38_i + \beta_4 UE_{it} * D_PosUE_{i0} * D_sic38_i \\
 & + \beta_5 UE_{it} * D_NegUE_{i0} * D_sic73_i + \beta_6 UE_{it} * D_PosUE_{i0} * D_sic73_i \\
 & + \beta_7 UE_{it} * D_NegUE_{i0} * D_sic35_i + \beta_8 UE_{it} * D_PosUE_{i0} * D_sic35_i \\
 & + \beta_9 UE_{it} * D_NegUE_{i0} * D_sic36_i + \beta_{10} UE_{it} * D_PosUE_{i0} * D_sic36_i \\
 & + \beta_{11} UE_{it} * D_NegUE_{i0} * D_sic87_i + \beta_{12} UE_{it} * D_PosUE_{i0} * D_sic87_i \\
 & + \beta_{13} UE_{it} * D_NegUE_{i0} * D_StratQtr_{it} + \beta_{14} UE_{it} * D_PosUE_{i0} * D_StratQtr_{it} + \varepsilon_{it} \quad (3)
 \end{aligned}$$

Variable	Predicted Sign	Strategic Window 1			Strategic Window 2		
		Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
Intercept	n/a	-0.01	-1.56	0.12	-0.01	-1.15	0.25
UE _t *D_NegUE	+	0.55	2.54	0.01	0.65	2.01	0.02
UE _t *D_PosUE	+	0.34	1.27	0.10	0.34	0.76	0.22
UE _t *D_NegUE*D_sic38	n/a	0.00	0.01	0.99	-1.29	-1.59	0.11
UE _t *D_PosUE*D_sic38	n/a	-0.10	-0.34	0.73	0.26	0.49	0.62
UE _t *D_NegUE*D_sic73	n/a	-0.14	-0.24	0.81	2.35	1.88	0.06
UE _t *D_PosUE*D_sic73	n/a	-1.04	-0.91	0.37	-0.53	-0.41	0.69
UE _t *D_NegUE*D_sic35	n/a	0.86	2.03	0.04	1.03	2.48	0.01
UE _t *D_PosUE*D_sic35	n/a	-0.25	-1.55	0.12	-1.20	-1.04	0.30
UE _t *D_NegUE*D_sic36	n/a	0.50	0.64	0.52	1.03	0.44	0.66
UE _t *D_PosUE*D_sic36	n/a	0.06	0.12	0.91	0.14	0.06	0.95
UE _t *D_NegUE*D_sic87	n/a	-0.07	-0.09	0.93	0.13	0.09	0.93
UE _t *D_PosUE*D_sic87	n/a	-0.11	-0.17	0.86	0.76	0.56	0.58
UE _t *D_NegUE*D_StratQtr	-	-0.60	-2.38	0.01	-0.77	-2.11	0.02
UE _t *D_PosUE*D_StratQtr	+/-	-0.41	-1.49	0.14	-0.43	-0.94	0.35
<i>N</i>				594			296
<i>F-stat p-value</i>				0.0269			0.1065
<i>R²</i>				0.0433			0.0700
<i>Adjusted R²</i>				0.0201			0.0236

D_sicXX 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: Mitigation Effect on the ERC from both Strategic and Non-Strategic Announcements

This table depicts the estimates of the effect of announcing a patent strategically on the firm’s ERC. The mitigation effect is estimated in a stacked format to facilitate the comparison between the strategic and non-strategic observations. An F-test finds that the mitigation for negative earnings surprises is significantly different between the strategic and non-strategic observations ($\beta_3 - \gamma_3 \neq 0$) in window 1 at the 5% level, but there is no statistical difference for window 2

$$\begin{aligned}
 EADRet_{it} = & D_StratObs * [\beta_0 + \beta_1 UE_{it} * D_NegUE_{i0} + \beta_2 UE_{it} * D_PosUE_{i0} \\
 & + \beta_3 UE_{it} * D_NegUE_{i0} * D_StratQtr_{it} \\
 & + \beta_4 UE_{it} * D_PosUE_{i0} * D_StratQtr_{it}] \\
 & + D_NonStratObs * [\gamma_0 + \gamma_1 UE_{it} * D_NegUE_{i0} + \gamma_2 UE_{it} * D_PosUE_{i0} \\
 & + \gamma_3 UE_{it} * D_NegUE_{i0} * D_NonStratQtr_{it} \\
 & + \gamma_4 UE_{it} * D_PosUE_{i0} * D_NonStratQtr_{it}] + \epsilon_{it} \quad (4)
 \end{aligned}$$

Variable	Predicted Sign	Strategic Window 1			Strategic Window 2		
		Coefficient	t-stat	p-value	Coefficient	t-stat	p-value
D_StratObs	n/a	-0.01	-1.49	0.14	-0.01	-1.64	0.10
UE*D_NegUE							
*D_StratObs	+	0.69	3.36	0.00	0.63	2.05	0.02
UE*D_PosUE							
*D_StratObs	+	0.21	1.06	0.14	0.02	0.06	0.48
UE*D_NegUE_0*D_Strat							
*D_StratObs	-	-0.61	-2.46	0.01	-0.55	-1.52	0.06
UE*D_posUE*D_StratQtr							
*D_StratObs	+/-	-0.42	-2.04	0.04	-0.10	-0.28	0.78
D_NonStratObs	n/a	-0.01	-1.60	0.11	-0.01	-1.55	0.12
UE*D_NegUE							
*D_NonStratObs	+	-0.27	-1.10	0.87	0.18	0.95	0.17
UE*D_PosUE							
*D_NonStratObs	+	0.41	2.16	0.02	0.36	2.43	0.01
UE*D_NegUE*D_StratQtr							
*D_NonStratObs	n/a	0.53	1.22	0.22	-0.06	-0.24	0.60
UE*D_PosUE*D_StratQtr							
*D_NonStratObs	n/a	-0.39	-1.88	0.06	-0.49	-3.02	0.00
<i>N</i>				1441			1441
<i>F-stat p-value</i>				0.0002			0.0081
<i>R²</i>				0.0236			0.0165
<i>Adjusted R²</i>				0.0168			0.0096

Appendix 1: 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
(c) 1999 Business Wire

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

(Copyright (c) 1995, PR Newswire)

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

(Copyright (c) 1996, Business Wire)

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