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New product preannouncements are strategic signals that firms direct at their customers, competitors, channel members, and investors. They have been touted as effective means of deterring competitor entry, informing potential customers, and even tipping the balance of technological standard battles in favor of the preannouncing firms. However, preannouncements also carry the risks of unwanted competitive reaction and the negative consequences of undelivered promises. From a shareholder value standpoint, do the benefits outweigh the risks of preannouncing? To address this question, the authors build on agency and signaling theories to develop hypotheses about the effects of preannouncements on shareholder value, and they empirically test these hypotheses on a sample of software and hardware new product preannouncements. The findings indicate that the financial returns from preannouncements are significantly positive in the long run. The authors show that preannouncements generate positive short-term abnormal returns only for firms that offer specific information about the preannounced product. They also show that firms earn positive long-term abnormal returns after a preannouncement if they continue to update the market on the progress of the new product. Both the short-term and the long-term returns are further magnified if the reliability of the preannouncement (i.e., the credibility of the preannouncing firm) is high. The findings offer executives of preannouncing firms clear guidelines on how to manage communications in the market to extract financial value from new product preannouncements.

New Product Preannouncements and Shareholder Value: Don't Make Promises You Can't Keep

Innovation is widely recognized as the cornerstone of firm growth and a primary source of competitive advantage.

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Firms, particularly those in technology markets, constantly strive to bring new product innovations to market quickly. Many of them also preannounce the introduction of their new products. By some estimates, more than 50% of new products are preannounced (Bayus, Jain, and Rao 2001). Should firms preannounce their new products? There are arguments both for and against this decision.

Firms preannounce new products for many reasons. Preannouncements can preempt competition (Bayus, Jain, and Rao 2001; Farrell 1987). They can educate consumers and potentially prompt them to wait for the preannounced products rather than buy available competitive offerings (Eliashberg and Robertson 1988; Greenleaf and Lehmann 1995). They can also help establish dominant industry standards (Farrell and Saloner 1986). Furthermore, the financial rewards to new product introductions are positive and significant (Bayus, Erickson, and Jacobson 2003; Chaney, Devinney, and Winer 1991; Pauwels et al. 2004). Therefore,

a firm could potentially accelerate these financial gains by preannouncing the new product.

Conversely, firms refrain from preannouncing for many reasons. First, informing the market about an upcoming product can alert competitors, whose defensive actions could outweigh the potential benefits of preannouncements (Robertson, Eliashberg, and Rymon 1995). Second, if a firm cannot deliver on its preannouncement promise, its reputation may suffer (Hoxmeier 2000). For example, the chief executive officer of EMC argued, "One way we have gained that credibility is in our refusal to follow the common practice of 'preannouncing' products months in advance of their release—the vaporware phenomenon, designed to get customers to hold off planned purchases of competing products. Because we don't do this, there is never that familiar delay in the launch" (Hemp 2001, p. 134). Finally, broken promises can also hurt the bottom line. Hendricks and Singhal (1997) find that, on average, delayed product launches decrease the market value of the firm by 5.25%, which in 1991 dollars is \$119.3 million.

Do the advantages of new product preannouncements outweigh the disadvantages? Despite the pitfalls of preannouncements, in general, academic research has viewed them as valuable signaling tools and has focused mainly on the reasons for and timing of preannouncements. Although these signals are theorized to convey favorable information about the firm's future prospects, there is little or no empirical evidence that they translate into financial returns for stockholders (cf. Mishra and Bhabra [2002], who find small positive short-term stock market returns to a sample of preannouncements reported in *The Wall Street Journal*). Perhaps, the litmus test for the decision to preannounce is a determination of how preannouncements affect firm and shareholder value in both the short run and the long run. Such a determination is in line with an increased interest in understanding the effects of marketing activities and market-based assets on shareholder value (e.g., Srivastava, Shervani, and Fahey 1998, 1999). Furthermore, the need to go beyond a short-term window in assessing the effect of firm assets and actions on firm value has been emphasized by emerging literature in marketing (Srivastava and Reibstein 2005) and finance (e.g., Brav and Heaton 2002; Gompers, Ishii, and Metrick 2003).

The primary purpose of this article is to examine the relationship between new product preannouncements and firm value. To understand this relationship, we need to assess the financial returns to firms from preannouncements and to determine the time horizon (short run versus long run) and conditions under which these returns accrue to the firm's shareholders. Are these returns significantly positive, and if so, are they of any economic significance? When do these returns accumulate? What are the determinants of these returns? Answers to these questions are important to senior management for making appropriate decisions on preannouncements and the timing of product launches.

To address these questions, we develop relevant hypotheses based on the signaling and structural uncertainty theories and construct a time dependent framework for stock market returns to preannouncements. Building on advances in the finance literature, we formulate risk-adjusted models of short- and long-term abnormal stock returns to product preannouncements, investigate the determinants of these abnormal returns, and empirically test our

hypotheses using data from the computer hardware and software industries.¹ For the long-term returns model, we use the calendar-time portfolio methodology (e.g., Asquith, Pathak, and Ritter 2005; Gompers, Ishii, and Metrick 2003; Lyon, Barber, and Tsai 1999; Mitchell and Stafford 2000; Womak 1996); subsequently, we outline its underpinnings and advantages.

THEORY AND HYPOTHESES

New Product Preannouncements as Market Signals

In a marketing context, a preannouncement has been defined as a formal and deliberate communication from a firm before it undertakes a particular marketing action, such as the introduction of a new product (e.g., Bayus, Jain, and Rao 2001; Eliashberg and Robertson 1988). Because a preannouncement precedes the occurrence of a corporate event, it has been conceptualized as a market signal directed at influencing the behavior of one or more stakeholders of the firm (Eliashberg and Robertson 1988; Robertson, Eliashberg, and Rymon 1995). These stakeholders include customers, competitors, channel members, and investors who evaluate the expected reaction of the other market participants and appropriately adjust the firm's stock market value.

We focus on new product preannouncements. Consistent with previous literature, we define a new product preannouncement as an announcement that a firm makes about the market availability of a new product it will offer at a future date (e.g., Bayus, Jain, and Rao 2001; Brockoff and Rao 1993; Eliashberg and Robertson 1988; Wu, Balasubramanian, and Mahajan 2004). Consistent with previous studies, we do not restrict our definition to the degree of completion of the product or its expected time to introduction, as long as the introduction of the product is not imminent. New product preannouncements have been widely observed in many industries, but they appear to be more prevalent in high-tech industries, in which speed of entry is particularly important (Bayus, Jain, and Rao 2001; Schatzel, Calantone, and Droge 2001; Wu, Balasubramanian, and Mahajan 2004).

Uncertainty and Information Asymmetry Associated with New Product Preannouncements

The value of a product preannouncement is intangible and is determined primarily by investors' perceived reactions of the other market participants. For example, consumers may choose to wait and purchase the preannounced product rather than buy an existing competing product (Greenleaf and Lehmann 1995). Competitors may or may not elect to introduce rival products (Bayus, Jain, and Rao 2001; Farrell 1987). Channel partners may begin to develop complementary products, increasing the demand for the new product. To the extent that these stakeholders' actions affect the future cash flows of the preannounc-

¹Consistent with the finance literature, we use the term "abnormal returns" to denote a situation in which the realized financial returns were unexpected and were obtained as a consequence of an event that was itself unexpected. Therefore, the term "abnormal returns" does not imply market inefficiencies or opportunities to "beat the market" by trading.

ing firm, the preannouncement affects the firm's market value. This effect is captured by the net present value (NPV) of the incremental future cash flows related to the preannouncement:

$$(1) \quad NPV = \sum_{t=0}^{\infty} \frac{\Delta CF_t}{(1+k)^t},$$

where ΔCF_t are the expected incremental cash flows resulting from the preannouncement at time t (net of any potential costs that may arise from adverse stakeholder actions) and k is the discount rate that reflects the risk associated with these incremental cash flows.

There is significant uncertainty and information asymmetry about the ultimate NPV of the preannouncement. The preannouncing firm has the latitude to keep some of the information about its new product private. In contrast, investors must find answers to a slew of questions about the outlook of the preannounced product, using mainly the information the firm releases. Will the new product be introduced as promised? Will customers' purchasing behavior be affected by the preannouncement? How will competitors react? Has the financial risk of the firm changed (Devinney 1992)? Although the sales of preannounced products can be forecasted to some extent (Brockhoff and Rao 1993), the incremental cash flows and the associated risks are not directly observable and easily predictable at the time of preannouncement. Managers and investors must estimate these cash flows according to their expectations of various market participants' future reactions to the preannouncement.² Thus, any method for measuring the NPV in Equation 1 must capture both predictable and unpredictable effects from the preannouncement and therefore should be rooted in a theoretical framework that accounts for information uncertainty and learning. The following sections present relevant theory from signaling and rational learning and introduce the appropriate metrics to capture the NPV of the preannouncement.

Timing and Determinants of Abnormal Returns to Preannouncements

Traditionally, changes in firm value resulting from signals carrying financial information have been measured with either stock market reactions or changes in Tobin's q ratio (Srinivasan and Bharadwaj 2004). The financial impacts of announcements such as new product introductions (e.g., Chaney, Devinney, and Winer 1991; Pauwels et al. 2004; Srinivasan et al. 2004), corporate name changes (Horsky and Swyngedouw 1987), brand extensions (Lane and Jacobson 1995), joint ventures (Houston and Johnson 2000), additions of the Internet channel (Geyskens, Gielens, and Dekimpe 2002), and celebrity endorsements (Agrawal and Kamakura 1995) have been studied using short-term stock market abnormal returns measured around the day of

the particular announcement. The effects of customer satisfaction (Anderson, Fornell, and Mazvancheryl 2004) and branding activities (Rao, Agarwal, and Dahlhoff 2004) have been analyzed using Tobin's q as the metric for firm value.

In the case of corporate announcements (including new product preannouncements), stock market abnormal returns are a particularly appropriate metric of financial performance because they provide a forward-looking measure of changes in firm value. Abnormal returns can be measured using either a short-term horizon surrounding the date of the announcement (e.g., Brown and Warner 1985) or a long-term horizon that extends beyond the announcement date (e.g., Kothari and Warner, in press). Subsequently, we discuss why and how returns to preannouncements accrue in both the short run and the long run.

Short-term effects of preannouncements on firm value. Agency theory (e.g., Bergen, Dutta, and Walker 1992; Eisenhardt 1989) provides a theoretical framework for studying the effect of new product preannouncements on investor assessment of firm performance. The shareholders and investors in the preannouncing firm (the principals) depend on the firm's management (the agent) to run the firm in such a way that maximizes the value of their shares. Investors observe how the management carries out the contract with the shareholders and adjust stock prices according to their assessment of how well the management is performing.

The preannouncement of a new product that is not yet available presents a classic information asymmetry problem that could lead to adverse selection. Adverse selection is a problem in agency theory whereby the agent most keen to conduct business with the principal is also most likely to produce an adverse outcome for the principal. The problem occurs because of information asymmetry between the principal and the agent; that is, the agent has some private information that the principal can infer only from the agent's signal. In a new product preannouncement context, true information about the development stage of the new product is known only to the managers, not to the investors. If investors are unable to observe the true development stage of the new product, they could infer that firms are likely to preannounce when the management knows that the product is a potential flop (Akerlof 1970; Kirmani and Rao 2000; Mishra, Heide, and Cort 1998). This situation is similar to that in Akerlof's (1970) model, in which used-car buyers (the principals) cannot observe product quality, resulting in a market in which only lemons trade.

The management of a firm with a potentially successful new product can mitigate the adverse selection problem by providing a credible signal of the true product development stage (i.e., how close the new product is to market introduction). According to signaling theory (Spence 1973), such a signal can create a separating equilibrium (a market outcome in which the firm with a new product that is closer to launch will credibly signal that private information, whereas the firm with a new product that is farther from introduction will refrain from sending the signal) if the cost of the preannouncement signal is higher for firms whose products are farther from introduction than for firms whose products are closer to launch. We propose that the specificity of the preannouncement can act as a credible signal of the true product development stage.

²Throughout the article, we distinguish between "risk" and "uncertainty" on the basis of the framework that Knight (1921) first proposed. "Risk" refers to a situation related to an event whose outcome is not deterministic but is governed by a known probability distribution. "Uncertainty" refers to a situation in which even the probability distribution of the outcome is unknown.

We define “preannouncement specificity” as the amount of information provided in the preannouncement that is intended to reduce investor uncertainty associated with the forthcoming product. For the signal to be credible, it must offer some irreversible information or place some constraints on the firm that would make it costly to renege. Moreover, the cost must be higher for firms that are behind in the developmental process. For example, a specific time to introduction may suggest that the firm has a concrete timetable in mind and is confident of meeting that deadline (Bayus, Jain, and Rao 2001). Alternatively, details regarding the price of the preannounced product may suggest that the firm already has an advanced product version that was tested for pricing. The more specific the preannouncement, the fewer degrees of freedom the firm has with respect to the timing and manner of new product introduction, and the greater is the probability of defaulting on the original promise.

Thus, price and time to introduction are key indicators that will be factored into the market participants’ decision to wait for the preannounced product. Recanting on such details will reduce the firm’s ability to influence these stakeholders in the future (Prabhu and Stewart 2001), erode the firm’s reputation (Roberts and Dowling 2002), and expose the firm to serious legal liabilities with potentially large monetary penalties (Bayus, Jain, and Rao 2001). Therefore, we expect that specificity will create a separating equilibrium in which firms that are ahead of the product development curve use more specific preannouncements, whereas those that are behind the curve use less specific preannouncements.

The role of specificity is similar to that of the warranty in Akerlof’s (1970) model. By choosing to sell the lemons “as is” but offering a warranty on plumes, the salesperson is signaling the unobserved car quality. The signal is credible and results in a separating equilibrium because it would be costly for the salesperson to cheat and offer a warranty on a lemon. In addition, “specificity” in our context can be viewed as analogous to the level of education in Spence’s (1973) model. In his model, education is less costly (in terms of effort) for productive workers, allowing employers to use the observed level of education as a credible signal that separates workers on the unobserved productivity level. Similarly, we argue that specificity is less costly for firms that are ahead in product development, allowing investors to use it as a credible signal that separates firms on the unobservable true product development stage.

On the first public release of the preannouncement, rational investors will recognize the role of specificity in creating a separating equilibrium and will immediately adjust the firm’s stock prices accordingly.³ Therefore, we advance the following hypothesis:

³Similar arguments have been used in the finance literature to demonstrate the signaling effect of various corporate events. For example, John and Williams (1985) show that firms use the strength of the dividend (i.e., the amount of dividend divided by the share price) to signal future favorable prospects. Vermaelen (1981) shows that firms use stock repurchases to signal the management’s favorable private information, and this signal results in a 15% abnormal stock return surrounding the day of the announcement. Eckbo (1986) shows that the issuance of convertible debt signals management’s unfavorable private information, and this signal results in a -1.25% abnormal stock return surrounding the day of the announcement.

H₁: The greater the new product preannouncement specificity, the greater are the short-term abnormal returns to the preannouncement.

In addition to preannouncement specificity, the reliability of the firm making the preannouncement may influence investors’ reactions to the new product preannouncement. We define the “preannouncement reliability” of a firm as the extent to which the firm has fulfilled claims it made in its previous product preannouncements. Preannouncement reliability can be viewed as a component of firm reputation, which is central to successful firm performance (Holmstrom 1979; Wilson 1985). Firms with high reputation have been shown to enjoy numerous advantages. For example, favorable reputations may enable firms to inhibit the mobility of their rivals (Fombrun and Shanley 1990), to have better access to capital markets (Beatty and Ritter 1986), to charge premium prices (Milgrom and Roberts 1986), and to sustain superior profit outcomes over time (Roberts and Dowling 2002). Thus, the costs of a loss of reputation are greater for high-reputation firms than for low-reputation firms. In our context, the cost of defaulting on the preannouncement promises should be higher for firms with greater preannouncement reliability.

Investors are likely to view the preannouncements of firms that have good records of delivering on their prior preannouncements more favorably than those of firms that do not have good records of delivering on their promises. They face less uncertainty in estimating the future cash flows associated with the preannounced products of firms that have greater preannouncement reliability than those of other firms. Therefore, we hypothesize the following:

H₂: The greater the product preannouncement reliability of the preannouncing firm, the greater are the short-term abnormal returns to the product preannouncement.

The effect of specificity on short-term abnormal returns is also likely to depend on the reliability of the preannouncing firm. Market participants, including investors and customers, could view a firm that has failed to deliver on prior promises as the “boy who cried wolf” and may fail to take seriously even a new product preannouncement with detailed content or high specificity. Although specificity potentially reduces the adverse selection problem, reliability magnifies the costs associated with specificity and can diminish the perceived adverse selection problem even further (Mishra, Heide, and Cort 1998). Indeed, recanting on specific preannouncement information would be costly for high-reliability firms, which enjoy the advantages that a positive reputation brings (e.g., Fombrun and Shanley 1990). Such firms would not risk losing these advantages, which further increases the likelihood that they would introduce the preannounced product as promised.

Alternatively, if all firms had low levels of preannouncement reliability, there may not be a significant difference between the high-specificity signals issued by firms that are ahead in the new product development process and those issued by firms that are behind, because both types of firms would not have too much to lose. Thus, for low levels of preannouncement reliability, we expect that there will be a pooling equilibrium in which investors view the preannouncements from both types of firms as equally credible. In summary, the greater the reliability, the more likely it is

that specificity will convey a meaningful signal and produce a separating equilibrium. Thus, we hypothesize the following:

H₃: Preannouncement reliability of the preannouncing firm moderates the relationship between preannouncement specificity and the short-term abnormal returns to the preannouncement such that the relationship is stronger for firms with high reliability than for firms with low reliability.

Long-term effect of preannouncements on firm value. We have argued that because adverse selection theory offers investors a basis for assessing the informational content of preannouncements, its predictions will be incorporated into stock prices around the event date, justifying the use of short-term abnormal returns as an appropriate measure for change in firm value. However, the impact of preannouncements on firm value is not limited to the effects predicted by the adverse selection theory. During the period that follows the preannouncement, the firm learns more about the development of the preannounced product. As this additional information becomes available, the firm may choose to disseminate it to the public, and the informational content of these updates may have an additional effect on firm value.

We argue that this effect will not be captured by the short-term stock returns measured around the preannouncement date but rather by the long-term returns measured after the preannouncement. This is because the use of short-term returns implicitly assumes that investors immediately understand all the financial consequences of corporate announcements, including those related to future competitor responses and other future events about which there is a high level of initial uncertainty. This assumption of a “complete and immediate investor response” is a fundamental premise of the “efficient market” (or “rational expectations”) paradigm. However, is it a reasonable assumption in our context? An assessment of the two fundamental assumptions of the efficient market paradigm and their implications for new product preannouncements is warranted.

The first assumption of the efficient market theory is that economic agents (or investors) are rational. This implies that they use all publicly available information, instantly update their posterior probabilities according to Bayes’ rule, and always make decisions that are consistent with the expected utility theory. In the context of preannouncements, this assumption implies that investors process the totality of the information conveyed by the preannouncement (along with all its strategic consequences) in a deliberate and rational manner and make optimal decisions without any behavioral biases. The rationality assumption has been relaxed in the behavioral finance literature (e.g., Odean and Barber 2000, 2001; Shefrin 2005). Specifically, this literature assumes that investors make decisions using non-Bayesian updating schemes and value functions that are different from the expected utility paradigm. We do not follow the behavioral finance approach in this article, because we have no a priori expectations about any behavioral biases that may arise when investors value preannouncements.

The second assumption is that investors are endowed with complete structural knowledge of the economy. This assumption means that investors are presumed to have a complete understanding of the “laws of nature” that govern the relationships between various economic variables (e.g.,

Friedman 1979; Kurz 1994). For preannouncements, this assumption implies that investors completely understand not only the supply, demand, and equilibrium price for the upcoming product but also the way the responses of market participants affect the equilibrium outcome of this complex dynamic system.

If investors were indeed endowed with structural knowledge, the entire effect of a preannouncement would be incorporated by the stock market over a short-term horizon, but the structural knowledge assumption seems particularly strong in the case of new product preannouncements. If investors are clairvoyant, why would product delays be penalized by investors, who should have expected them in the first place (Hendricks and Singhal 1997)? Why would intentional vaporware be able to deter entry rather than being ignored by investors and competitors alike (Bayus, Jain, and Rao 2001)?

An emerging stream of research in finance and economics, commonly referred to as the rational learning or structural uncertainty literature, has relaxed investors’ structural knowledge assumption of the efficient market theory, while maintaining the rationality assumption in decision making (e.g., Brav and Heaton 2002; Brennan and Xia 2001; Gompers, Ishii, and Metrick 2003; Kurz 1994; Lewellen and Shenken 2002; Lewis 1989). According to this literature, investors are rational, but they neither know the underlying “laws of economics” nor act as if they do. As more information becomes available, they update, in a Bayesian manner, their prior beliefs about the particular set of “laws” that govern a given relationship. In general, this process involves the observation of a series of realized events over time, as well as their economic outcomes. This process indirectly enables investors to learn about the probability distribution function of the firm’s future cash flows, which in turn results in a change in firm value. Thus, with rational learning, stock prices move not only when new information becomes available but also when investors improve their understanding of the various economic relationships that shape the market equilibrium. In summary, long-term stock returns accrue to any event whose impact on firm value is not fully understood by investors at the time of its occurrence and about which more information becomes available during the subsequent months or years.

The rational learning paradigm provides an appropriate justification for examining the long-term abnormal stock returns to new product preannouncements. In most cases, the absence of consistent time series of prior data makes it difficult for investors to form any type of expectation about the ultimate development and introduction of the preannounced product because no two preannouncement events are the same. Thus, investors are likely to require considerable time to learn about each preannouncement before they can estimate the level and risk of incremental future cash flows and understand the equilibrium response strategy that the firm’s stakeholders may adopt.

As we argued previously, we believe that for investors to learn about the preannounced product, new relevant information must become available after the preannouncement. We define “preannouncement updating” as the extent to which the preannouncing firm continues to disseminate information about the preannounced product to the market. Every time the firm releases new information about the preannounced product (e.g., a revised date of introduction,

price or product features), it reduces the uncertainty surrounding it (Jacoby et al. 1994). If the update does not provide any new information, investors might not take the firm's next update seriously. We treat preannouncement updating as a variable that represents the net positive incremental information about the new product (net of negative information, such as introduction delays). Thus, the greater the postpreannouncement information flow, the more likely it is that the preannouncement is better understood and viewed as more credible. As a result, investors gain the structural knowledge necessary to estimate better the future cash flows and the risk levels associated with the preannouncement, and stock prices gradually adjust to reflect this new knowledge.

The amount of preannouncement updating can also reduce the moral hazard problem that investors as principals face after the management (agent) makes the preannouncement (Holmstrom 1979; Mishra, Heide, and Cort 1998). If managers believe that the preannouncement has attained its purpose in influencing market participants' behavior, do they still have an incentive to deliver on the preannouncement promises? In addition to safeguarding reputation, the incentive comes from the firm's desire to realize fully the financial potential of the preannouncement. Indeed, the moral hazard problem is likely to cause investors to discount the value of the preannouncement significantly at the time it is made. This is because uncertainty increases the discount rate to a level beyond what is a fair compensation for risk (Merton 1987; Varian 1985). Thus, in the presence of uncertainty related to future moral hazard, investors will initially penalize the preannouncing firms by requiring a higher-than-normal rate of return on their stock, resulting in lower-than-normal stock prices on the preannouncement date.

However, every time a firm updates investors about the prospects of the forthcoming product, moral hazard is mitigated, and investors' uncertainty is reduced accordingly. Over time, this resolution of uncertainty will be reflected in an accrual of long-term stock returns to the preannouncing firm. These arguments yield the following hypothesis:

H₄: The greater the updating of a new product preannouncement, the greater are the long-term abnormal returns following the preannouncement.

As we argued in the case of short-term abnormal returns, investors and stakeholders are likely to place greater weight on the information coming from firms with high reliability. Thus, we expect that the effect of preannouncement updating on long-term stock returns will be moderated by the reliability of the preannouncing firm, such that updating information will be deemed to be more meaningful if it is backed by strong preannouncement reliability. Indeed, a reliable firm has a high incentive to keep the preannouncement current only when it observes favorable private information about the preannounced product's development process. Acting otherwise would result in significant reputation costs that may well exceed the potential benefits associated with updating. That is, a high-reliability firm has fewer incentives to "cheat" by providing "false" updates than does a low-reliability firm. As a result, investors may not respond as positively to the updates made by firms with low preannouncement reliability, which are unlikely to convey meaningful information about the product's ultimate

introduction prospects (Riley 2001). This reasoning leads to the following hypothesis:

H₅: Preannouncement reliability of the preannouncing firm moderates the relationship between preannouncement updating and the long-term stock returns to a preannouncement such that the relationship is stronger for firms with high reliability than for firms with low reliability.

To the extent that preannouncement reliability has a direct effect on firm value, we expect that this effect will be incorporated into the short-term abnormal returns because all information about reliability is available at the time of the preannouncement. Therefore, we do not expect that preannouncement reliability will have a direct effect on long-term returns.

DATA AND EMPIRICAL CONTEXT

We test our hypotheses in the high-tech context of the software and hardware industries. Data from these industries have been used in the context of new product introductions (Bayus, Erickson, and Jacobson 2003) and preannouncements (Bayus, Jain, and Rao 2001). In high-tech industries, new technologies proliferate rapidly, making it important for firms to keep their stakeholders abreast of forthcoming innovations. A perception among managers in these industries is that product life cycles are getting shorter, prompting firms to introduce and announce their next generation or upgraded products faster. Furthermore, because of the heightened competitiveness in these industries, investors look for product preannouncement signals to evaluate a firm's competitive advantage over its peers. Therefore, it is unsurprising that about half of the products in these industries are preannounced (Bayus, Jain, and Rao 2001).

The first step in data collection involved conversations with industry experts and a review of publications covering new product announcements in an electronic format during the period for which data were collected (1984–2000). We identified two publications, *Computerworld* and *Newsbytes*, as potential sources of software and hardware new products that could have been preannounced. Together, these publications covered a significant portion of new products introduced in the software and hardware industries during the period of study because they are two of the longest-running magazines in the computer business and the only industry-specific publications that were featured in LexisNexis for the entire period we study. We searched these two publications for all articles published between 1984 and 2000 that contained the words "launch," "announce," "beta," and "introduce." This approach is consistent with that of Hendricks and Singhal (1997), who searched for product delay announcements in the Dow Jones News Service using the keywords "product introduction," "delay," "postpone," and "move." We scanned several thousand articles to create a list of products that were either preannounced or announced at introduction. In the second step of the data collection, we attempted to identify the true preannouncements among the new products identified through the first step. Specifically, we searched across all news sources available in LexisNexis (including news wires) for the first date the product was announced in the marketplace. If this first date coincided with or followed the introduction date, we did not retain the product in our sample, because our focus is on preannouncements. We classified a new product-related

announcement as a preannouncement if the firm stated that the product would be introduced at a later date and if the introduction date was either unspecified or specified to follow the preannouncement by at least a week. We conducted a broad search to retrieve an accurate preannouncement date, which is the earliest date when information about the product became publicly available, and this date necessarily corresponds to the date around which the short-term stock market reaction to the preannouncement takes place. We further eliminated preannouncements that did not belong to publicly traded firms and product introduction announcements that were not preceded by a preannouncement. We did not include in our sample any preannouncements in which the firm stated that the product was ready to ship, regardless of the time lag between the preannouncement date and the stated expected introduction date. We obtained a usable sample of 419 preannouncements made by 100 firms between 1984 and 2000. We painstakingly checked the accuracy of the preannouncement dates through several rounds of searches.

The data indicate that preannouncements are made by all types of firms, ranging from large, dominant firms with as much as \$80 billion in assets to small firms with approximately \$4 million in assets. There is also substantial variation in preannouncement specificity, which includes the announced lead time to introduction. The time between preannouncement date and the expected introduction date ranged from one week to two years among the preannouncements that offered an expected time of introduction.

In addition to gathering preannouncement information, we collected information on the ultimate introduction of the preannounced products in our sample. We conducted Lexis-Nexis searches across all available news sources to retrieve either introduction announcements made by the firms themselves or news articles from which it could be inferred that the preannounced product had been introduced. Only 37 of the 419 preannounced products had formal introduction announcements. In addition, we were able to retrieve the approximate introduction dates for another 41 products by using information from various news sources that mentioned that the product was already on the market. The average time from preannouncement to introduction for these products is 156 days.

We obtained stock returns from the Center for Research on Security Prices at the University of Chicago. Our long-term abnormal-return metrics (which we discuss subsequently) require the use of the three factors that Fama and French (1993) propose, as well as the momentum factor that Carhart (1997) proposes. We obtained data on these four factors from Ken French's Web site at Dartmouth College (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_mom_factor.html). Finally, we obtained firm-level accounting data on control variables from COMPUSTAT.

MEASURES AND MODELS

Dependent Variables: Abnormal Stock Returns

Testing our hypotheses requires metrics of abnormal stock returns for both short- and long-term horizons. The short-term horizon typically consists of a narrow five-day window centered on the announcement day. The long-term horizon starts after the end of the short-term window and typically extends for at least one year. Table 1 provides a

brief illustration of the type of events that produce significant long-term abnormal returns, along with the measurement metric used and the magnitude of the abnormal returns measured (for an extensive review, see Kothari and Warner, in press).

Methods to Measure Short- and Long-Term Abnormal Returns

The methodologies we use for measuring short- and long-term abnormal returns are strikingly different from each other. Both methods entail a comparison of realized stock returns with those that would have occurred if the event had not taken place (i.e., the "expected" returns), but the similarities stop here. For short-term returns, a simple event study methodology is appropriate (Brown and Warner 1985). Because this methodology has been used in several marketing studies (e.g., Agrawal and Kamakura 1995; Chaney, Devinney, and Winer 1991; Geyskens, Gielens, and Dekimpe 2002; Horsky and Swyngedouw 1987; Lane and Jacobson 1995), we briefly outline the computation of the cumulative abnormal returns (CAR), our measure of short-term performance, in Appendix A.

However, the event study methodology has a major limitation that makes it inappropriate for measuring long-term abnormal returns to events that are clustered in time—namely, the inability to account properly for cross-sectional dependency (or overlap) between events that could lead to misleading statistical inferences (Barber and Lyon 1997; Kothari and Warner, in press; Mitchell and Stafford 2000). To measure long-term returns appropriately, we use a new methodology from the finance literature—specifically, the calendar-time portfolio analysis. In this method, we first construct a portfolio (called a calendar-time portfolio) to include all stocks of the preannouncing firms, and then we measure the long-term abnormal returns to that portfolio. We present details on portfolio construction in Appendix B.

After constructing the calendar-time portfolio, we measure its abnormal returns using the three-factor model that Fama and French (1993) propose. This model, which has been shown to produce a better estimate of expected stock returns than the capital asset pricing model (Fama and French 1993), posits that the expected rate of return of a portfolio is a function of the overall stock market returns, as well as the size and book-to-market ratio of the portfolio.

To compute abnormal returns using this three-factor model, we regress the raw returns of the calendar-time portfolio on the market, size, and book-to-market factors as follows:

$$(2) \quad R_{pt} - R_{ft} = \alpha_p + \beta_p(R_{mt} - R_{ft}) + \gamma_p \text{SMB}_t + \delta_p \text{HML}_t + \varepsilon_{pt},$$

where R_{pt} is the rate of return of the calendar-time portfolio p during month t and R_{ft} is the rate of return on a U.S. Treasury bond f during the same period; R_{mt} is the average rate of return of all stocks trading on the U.S. stock market, SMB_t is the difference between the rate of returns of small- and large-firm stocks (small minus big), and HML_t is the difference in returns between high and low book-to-market stocks (high minus low), all during month t ; and ε_{pt} is an error term, α is the model intercept, and β , γ , and δ are parameter loadings of the three factors we used in the model. Because the number of firms in the calendar-time portfolio changes in each month, we estimate Equation 2 using the weighted least squares method (in which the

Table 1
SUMMARY OF SELECTED STUDIES IN THE FINANCE LITERATURE THAT USE LONG-TERM ABNORMAL RETURNS

<i>Event or Strategy Type</i>	<i>Study</i>	<i>Sign of the Announcement Abnormal Return</i>	<i>Sign and Annualized Magnitude of the Long-Term Postevent Return (% per Year)</i>	<i>Long-Term Metric Used</i>
<i>Long-Term Abnormal Returns to an Event</i>				
Seasoned equity offerings	Loughran and Ritter (1995)	–	–5.4% –11.0%	Calendar-time three-factor abnormal return, long-term CAR
Dividend initiations	Michaely, Thaler, and Womack (1995)	+	+7.5%	Buy-and-hold abnormal returns
Changes in analyst recommendations	Womack (1996)	+ for upgrades – for downgrades	+4.8% for upgrades –4.6% for downgrades	Calendar-time three-factor abnormal returns
<i>Long-Term Abnormal Returns to a Strategy</i>				
Momentum	Jegadeesh and Titman (1993)	N.A.	+14.5% for simultaneous long positions on prior winners and short positions on prior losers	Calendar-time hedge portfolios using raw returns
High prior short interest ^a	Asquith, Pathak, and Ritter (2005)	N.A.	–26% to –46%	Calendar-time four-factor abnormal returns
Governance quality	Gompers, Ishii, and Metrick (2003)	N.A.	+8.5% for simultaneous long positions in good governance and short positions in bad governance firms	Calendar-time four-factor abnormal returns
High dispersion of analyst forecasts	Diether, Malloy, and Scherbina (2002)	N.A.	–4% to –7%	Calendar-time three-factor and four-factor abnormal returns

^aShort interest, which is measured monthly, is the ratio of the total number of shares sold short to the total shares issued by the company.

Notes: “+” indicates a significantly positive abnormal return, and “–” indicates a significantly negative abnormal return. N.A. = not applicable.

weighting vector is the square root of the number of firms with preannouncements in the relevant calendar month) to provide greater weight to the calendar months in which the portfolio contains more firms.

If the portfolio's postevent stock performance is “normal,” given its market risk, size, and book-to-market characteristics, the variation in postevent returns, R_{pt} , is captured entirely by the three risk factors, and the regression intercept is zero. Thus, the intercept α_p is the mean monthly abnormal return of the portfolio. For expositional ease, we report all abnormal returns on an annual basis, multiplying the intercept by 12.

The main advantage of the calendar-time method is that it automatically accounts for cross-sectional correlation of returns (Lyon, Barber, and Tsai 1999, p. 193; Mitchell and Stafford 2000, p. 288). This is because the standard error of the abnormal-return estimate α_p is not computed from the cross-sectional variance (as is the case with the event study method) but rather from the intertemporal variation of portfolio returns. Given rational investors, monthly stock returns are serially uncorrelated (Kothari and Warner, in press), so the methodology is well specified, and statistical inferences are likely to be more accurate than those obtained with event studies in which the standard error is computed within the cross-section.

A drawback of the calendar-time portfolio method is that it does not produce separate measures of abnormal returns for each event. Instead, stocks must first be grouped into a portfolio, and a single measure of abnormal returns is obtained for the entire group. Because of this grouping, it is not possible to use a cross-sectional regression model to analyze the relationships between abnormal returns and

event-specific independent variables. Therefore, to test H_4 , we divide our events into two groups according to the values of preannouncement updating and form a calendar-time portfolio for each group. The first group contains all events whose preannouncement updating values are at least equal to the sample median. The second group contains the “below-median” events. By comparing the intercepts from the two groups, we can determine the effect of updating on long-term abnormal returns.

To test the interaction effects of updating and reliability as required in H_5 , we classify the events into four subgroups, representing the intersection of the two subgroups based on updating and the two subgroups formed independently based on reliability. For each subgroup, we estimate a separate calendar-time portfolio and obtain a separate regression intercept. To test H_5 , we examine all pairwise differences among the four portfolio intercepts. Because the number of subportfolios increases exponentially with the number of independent variables, it would be impractical to deal with three or more independent variables because that would dramatically reduce the number of observations in each portfolio, causing a significant loss of power in the empirical tests.

Accounting for Momentum and Direction of Causality

In any study of long-term abnormal returns, it is important to determine whether the measured returns are due to the event or to prior firm performance. For example, it could be argued that firms that do well are more likely to preannounce, which would reverse the direction of causality. The concern is of particular relevance in view of the “momentum” effect, which is observed when a firm's stock

performance during the previous year continues during the subsequent year (Jegadeesh and Titman 1993). Suppose that firms preannounce only after they experience higher-than-usual stock returns. Using Jegadeesh and Titman's (1993) result, we would expect that these high stock returns would continue over the next year even in the absence of a preannouncement. Thus, the three-factor abnormal returns could capture only this momentum effect rather than the change in firm value associated with the preannouncement. To eliminate this possibility, we control for momentum by including a fourth factor in Equation 2. Specifically, we compute an alternative measure of abnormal returns using the following model:

$$(3) \quad R_{pt} - R_{ft} = \alpha'_p + \beta'_p(R_{mt} - R_{ft}) + \gamma'_p \text{SMB}_t \\ + \delta'_p \text{HML}_t + \lambda_p \text{UMD}_t + \eta_{pt},$$

where UMD_t is a momentum factor proposed by Carhart (1997), defined as the difference in the returns of firms with high and low prior stock performance ("up" minus "down") during month t ; λ is the loading on the momentum factor; η_{pt} is the error term; and the rest of the terms are as defined in Equation 2. The momentum factor is constructed monthly as the size-adjusted difference between the rate of returns of a portfolio of stocks whose return performance was in the top 30% during the previous year and the rate of returns for a portfolio of stocks whose return performance was in the bottom 30% during the previous year. Additional details are available at Ken French's Web site (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_mom_factor.html). The new intercept, α'_p , provides a measure of monthly abnormal stock returns that controls for the firm's prior performance.

Accounting for Other Events Occurring in the Long-Term Window

A potential concern with any measure of long-term stock performance is the extent to which it captures the abnormal returns caused by the event under study rather than other idiosyncratic events that may occur during the measurement window. Consistent with studies in the finance literature, we assume that the unexpected informational content of these other events has a mean equal to zero (Kothari and Warner, in press). Indeed, although firms in our sample might have experienced a series of favorable or unfavorable idiosyncratic events, we assume that, on average, these events cause stock prices to move as expected, so their abnormal returns are zero. This assumption is validated by Lyon, Barber, and Tsai (1999) and by Mitchell and Stafford (2000), who show that for a sample of randomly selected firms (for which event dates are also chosen at random), the average calendar-time portfolio abnormal returns are zero during the one year following the simulated event. Their results suggest that the informational content of all idiosyncratic events that occurred during their sample period is such that the abnormal returns are, on average, zero.

Primary Independent Variables

Product preannouncement specificity. We content-analyzed the preannouncements to identify the extent to which they provide specific, objective information that investors could use to evaluate them. We found that in addition to a technical description of the product, detailed pre-

announcements provided information about the price of the upcoming product or an expected time to introduction. Because technical claims are not directly comparable from one product to another, we focused on price, which has been shown to be a useful signal to assess the quality of a new product (Winer 1986), and the time to introduction, which has been theorized to act as a credible signal about product development costs (Bayus, Jain, and Rao 2001). As we indicated previously in the description of the calendar-time portfolios, we must create a dichotomous variable of preannouncement specificity and use it to separate events into two portfolios based on high and low levels of specificity. We operationalize the specificity of each preannouncement using a dummy variable that equals unity if either a time to introduction or a price for the product is provided and 0 if otherwise.

If there were two or more relevant announcements made (by the firm or any press source) in the two-day window following the preannouncement, we used the one with the most detailed content. We did so while verifying through extensive LexisNexis searches that no other mentions of the preannounced product were made before the date we use as the preannouncement date. Thus, we ensure that the five-day window over which we measure the short-term returns captures the first mention of the preannouncement and as many preannouncement details as were publicly available to investors. In addition, we explored two other potential measures of specificity. First, we collected data on the geographical scope of the media vehicle through which the announcement was made (national versus regional). Only 3 of the 419 preannouncements were made in the regional media. Second, we considered patent applications. We spent considerable time studying patent data available on the Delphion database but concluded that patents are not readily traceable to specific products. Therefore, investors would have the same difficulty in using patent information as a measure of specificity of the new product preannouncement.

Product preannouncement reliability. Investors assess the credibility of the preannouncement on the basis of the extent to which the preannouncing firm has delivered on its previous promises. We measure preannouncement reliability using a dummy that equals 1 if the firm delivered its most recently preannounced product on time and 0 if otherwise. Research on recency effects (Miller and Campbell 1959; Wyer and Scrull 1989) indicates that though investors may account for the entire preannouncing history of the firm, the last preannouncement, which contains the most current information, is the one they will weight more heavily.⁴

To reduce or eliminate the possibility of left censoring in the reliability variable, we conducted an additional round of searches outside our sample period (before 1984) to retrieve any preannouncements that preceded our sample. Specifically, we went back three years from the date of any prean-

⁴We subsequently report the results of robustness tests using reliability measures based on a weighted scheme that uses the previous two and three preannouncements; we weight the last preannouncement more than previous ones. However, using such a measure imposes a drastic reduction in sample size because many firms in the sample did not preannounce multiple times.

nouncement made during 1984–1986 and, using the same procedure as in the original sample, conducted a comprehensive search in LexisNexis to identify any out-of-sample preannouncements and information regarding their ultimate introduction. In all, we were able to compute a reliability measure for 341 of the 419 sample preannouncements.

Product preannouncement updating. Measuring the extent to which a preannouncing firm continues to disseminate information related to the preannounced product is not a straightforward task. Firms can communicate with their stakeholders through different avenues. For example, firms can disclose proposed new products privately to their suppliers or demonstrate beta versions of the product at trade shows. We use the public release of information relevant to the preannouncement as a proxy for this information flow. Although the firm may use other channels of communication, the updating of information in those channels is likely to be correlated with the updating of information released through public channels. To measure the public flow of preannouncement-specific information, we use the number of press releases or news wires occurring after the preannouncement and containing information about the preannounced product. We considered only updates that were released during the first year after the preannouncement, or until the product was introduced (whichever occurred first). We obtain these updates from the LexisNexis database and classify as an update any press release or news wire in which the preannounced product is mentioned, even if it is not the main focus of the news item. Because the median number of updates for the preannouncements in our sample equals one, we construct two calendar-time portfolios, one for preannouncements with no updates and one for preannouncements with at least one update.

Of the 354 information updates we identified, only 4 contain negative information, such as announcements of delays in product shipment. The small number of negative updates prevents us from creating a separate portfolio to assess the returns of this separate group. Instead, consistent with our conceptual arguments, we use only updates with nonnegative information in our analysis and exclude the 4 preannouncements followed by negative updates from the calendar-time portfolios. This practice is also consistent with the well-documented tendency of firms to convey good news ahead of time, which means that the number of updates is a proxy for the quantity of “good news” rather than “any news” about the preannounced product.

Additional Independent Variables

Innovativeness. The innovativeness of a preannounced product could affect the financial returns to the firm’s stockholders. A product preannounced as a radical innovation has the potential to yield greater returns than other preannounced products (e.g., Sorescu, Chandy, and Prabhu 2003). To measure the innovativeness of preannounced products, we content-analyzed the preannouncements to assess the innovativeness claims the preannouncing firms made. Using a list of keywords (e.g., “major breakthrough,” “shattered industry barriers,” “the product is an industry first”), we classified the products as radical or incremental. We operationalize this variable as a dummy that takes the value of 0 if the claimed innovativeness is incremental and 1 if it is radical.

Product category (software/hardware). To control for differences in abnormal returns that may accrue because of differences in market potential across product categories, we created a dummy variable that takes the value of 1 if the preannounced product is a hardware product and 0 if it is a software product. Because the preannouncements that contained both software and hardware products were only a few and, in general, focused on the hardware product, we combined them with the hardware preannouncements.

Firm size. Firm size is a potential determinant of the financial returns to a product preannouncement. The financial returns to a small firm, for which the preannounced product may be critical, could arguably be larger than the returns to a large firm. Moreover, for a constant dollar return, the relative return as a proportion of firm value is lower for larger firms. Therefore, we expect that firm size will have a negative effect on abnormal returns. Consistent with previous research, we use the log of a firm’s assets as a measure of size.

Spokesperson. The spokesperson making the new product preannouncement could potentially signal its importance and its likelihood of introduction. The costs of losing credibility in the event of nondelivery arguably increase with the rank of the spokesperson. Consequently, preannouncements made by the chief executive officer or members of the senior management of the firm could be perceived as more committed and credible than those made by lower-ranked employees. We operationalize this variable as a dummy variable that takes the value of 1 if the preannouncement is made by the chief executive officer or a member of the top management team and 0 if otherwise. Table 2 provides a summary of our operationalization of the independent, dependent, and control variables, along with the source of data for each variable.

RESULTS

Main Results

Table 3 presents mean values and a correlation matrix of the short-term abnormal returns to new product preannouncements, their determinants, and other independent variables, as well as the preannouncement updating variable. On average, the short-term returns are positive but not significantly different from zero at the 10% significance level. Thus, despite the several advantages of new product preannouncements hypothesized in the literature, it appears that, on average, the stock market does not recognize their value in the short run. However, the average short-term return conceals a large variance (approximately 8%). This result indicates that there are indeed preannouncements that generate significantly positive short-term abnormal returns and highlights the importance of identifying their determinants. None of the correlations among the variables of interest are high, suggesting that multicollinearity is not an issue in the data.

Determinants of Short-Term Abnormal Returns

The results from the market and market-adjusted models of short-term abnormal returns appear in Table 4. New product preannouncements with high specificity generate significantly positive short-term abnormal returns, in support of H_1 . The coefficient associated with the specificity variable is approximately 1.8% in both models and is statistically significant ($p < .05$ or better). Thus, consistent with

Table 2
VARIABLES, MEASURES, AND DATA SOURCES

Variable	Operational Measure	Data Source
Financial returns	Short-term abnormal returns five days around the preannouncement	Center for Research on Security Prices
	Long-term calendar-time portfolio-level returns (one year after the preannouncement or up to product introduction, whichever comes first)	Center for Research on Security Prices
	Fama and French's (1993) and Carhart's (1997) momentum factors	Ken French's Web site
Preannouncement specificity	Price of the new product	LexisNexis
	Announced time of introduction of the new product	LexisNexis
Preannouncement reliability	Whether the most recently preannounced product by the firm was introduced on time	LexisNexis
Preannouncement updating	Number of new mentions in the press about the preannounced product measured within a year from the preannouncement or up to introduction, whichever comes first	LexisNexis
Product category: software/hardware	Whether the preannounced product was a computer software or hardware product	LexisNexis
Innovativeness	Claimed innovativeness of the new product (incremental/radical)	LexisNexis
Firm size	Assets	COMPUSTAT
Spokesperson	Whether the preannouncement was made by the chief executive officer/top management executive versus others in the company	LexisNexis

Table 3
MEANS AND CORRELATION MATRIX OF VARIABLES PRIMARILY USED IN THE SHORT-TERM ABNORMAL RETURNS MODEL

	<i>M</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1. CAR market-adjusted model	.59%	1.00								
2. CAR market model	.42%	.99 (.00)	1.00							
3. Preannouncement specificity	.43	.20 (.00)	.19 (.00)	1.00						
4. Preannouncement reliability	.13	.15 (.00)	.15 (.00)	.03 (.52)	1.00					
5. Product category	.52	.02 (.63)	.02 (.62)	.00 (.94)	-.10 (.06)	1.00				
6. Innovativeness	.05	.02 (.65)	.03 (.57)	-.08 (.12)	.09 (.09)	-.02 (.70)	1.00			
7. Firm size	\$21,483m	-.14 (.00)	-.13 (.01)	-.07 (.15)	-.10 (.05)	.20 (.00)	.05 (.30)	1.00		
8. Spokesperson	.60	.05 (.30)	.06 (.27)	.09 (.09)	.07 (.15)	-.01 (.81)	.11 (.03)	-.10 (.06)	1.00	
9. Preannouncement updating	.32	-.05 (.32)	-.04 (.47)	.05 (.32)	-.02 (.65)	.04 (.42)	.07 (.15)	.01 (.76)	.15 (.00)	1.00

Notes: The values in parentheses are *p* values of significance.

our hypothesis, new product preannouncements with high specificity are perceived as credible signals of the unobserved product development process, leading to an increase in firm value.

However, the effect of preannouncement reliability on short-term abnormal returns is not significant ($p > .10$). Thus, H_2 is not supported. A possible explanation is that the specific details in a preannouncement might provide sufficient information to evaluate the future cash flows and the risk levels associated with the preannounced product so that in the presence of preannouncement specificity, the signal

provided by preannouncement reliability of the firm may not have a direct effect on firm value.

The results also support H_3 . The interaction between preannouncement specificity and reliability has a positive effect on short-term returns ($p < .01$), suggesting that specificity is more likely to create a separating equilibrium in the presence of high reliability. Because preannouncement reliability does not have a direct, significant impact on the short-term abnormal returns, its effect can be interpreted as moderating the relationship between preannouncement specificity and short-term abnormal returns, consistent with

Table 4
CROSS-SECTIONAL SHORT-TERM ABNORMAL RETURNS AROUND PRODUCT PREANNOUNCEMENT DATE

	<i>CAR Market-Adjusted Model</i>		<i>CAR Market Model</i>	
	<i>With Additional Variables</i>	<i>Without Additional Variables</i>	<i>With Additional Variables</i>	<i>Without Additional Variables</i>
Intercept	.032 (.020)	-.006 (.006)	.025 (.020)	-.008 (.006)
Preannouncement specificity	.018* (.008)	.018* (.007)	.017* (.008)	.017* (.007)
Preannouncement reliability	-.000 (.015)	.002 (.014)	-.001 (.015)	.001 (.014)
Preannouncement reliability × preannouncement specificity	.058** (.021)	.055** (.021)	.059** (.021)	.056** (.021)
Product category	.009 (.007)	—	.009 (.007)	—
Innovativeness	.016 (.016)	—	.017 (.016)	—
Firm size	-.005* (.002)	—	-.004* (.002)	—
Spokesperson	.002 (.007)	.002 (.007)	.003 (.007)	.003 (.007)
Adjusted R ²	.082	.064	.077	.062
Sample size	326	341	326	341

* $p < .05$.

** $p < .01$.

Notes: The standard errors appear in parentheses below each coefficient.

H₃. Thus, we find that the effect of specificity on stock returns is stronger for preannouncements with high reliability than for those with low reliability.

An examination of the effect of additional independent variables on short-term abnormal returns reveals that the claimed innovativeness of the preannounced products does not significantly affect short-term abnormal returns, though its effect is in the positive direction, as we expected. This result indicates that investors may view a firm's self-proclaimed radical innovation with some skepticism. Alternatively, it may also reflect a low level of statistical power because only approximately 5% of the preannounced products are touted as radical. Consistent with previous research that has found changes in firm value to be negatively related to firm dominance (Srinivasan et al. 2004), we find that firm size has a negative impact on the short-term abnormal returns ($p < .05$). Intuitively, because our measures of abnormal returns are percentage changes in firm value, it follows that larger firms experience a smaller percentage increase in firm value in response to events such as preannouncements. The coefficient of the product category variable is not significant either ($p > .10$), suggesting that product category does not materially change the market perception of the credibility of the preannouncement. The coefficient of the spokesperson variable is positive (as we expected), but it does not attain statistical significance ($p > .10$). However, we acknowledge that the effect of the spokesperson or other control variables could be specific to the data or the industry. Finally, the percentage of variation explained by the regression model is in line with those from

other studies of short-term abnormal returns around corporate events (e.g., Chaney, Devinney, and Winer 1991).

Because the average short-term abnormal returns are not significantly different from zero and because positive abnormal returns are observed for preannouncements with high specificity and/or reliability, a question arises as to whether there are any categories of preannouncements for which the abnormal returns are negative. The answer to this question can be found by examining the second and fourth models in Table 4. In both cases, the intercept is negative (–60 and –80 basis points, respectively) but nonsignificant ($p > .10$). That is, preannouncements with low specificity, those with low reliability, and those made by nonsenior executives may well earn negative abnormal returns. Such preannouncements could arguably be viewed as vaporware or desperate attempts to influence marketplace participants. An illustration of these results appears in Figures 1 and 2.

Determinants of Long-Term Abnormal Returns

In this section, we present the long-term abnormal returns using the four-factor model described in Equation 3. The results we obtained using the three-factor model described in Equation 2 appear in Appendix C. The calendar-time one-year abnormal returns across the entire sample are positive and statistically significant (14.10%, $p < .01$), suggesting that financial returns to new product preannouncements accrue over the long run. The results appear in Panel A of Table 5.

To compute the long-term abnormal returns to new product preannouncements and test H₄ and H₅, we first assign

Figure 1
SHORT-TERM MARKET MODEL ABNORMAL RETURNS

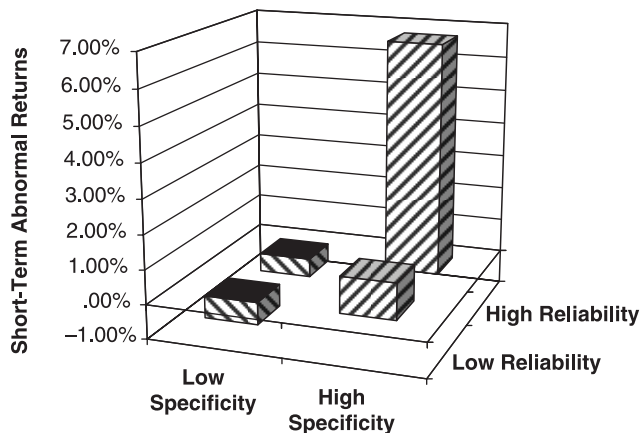
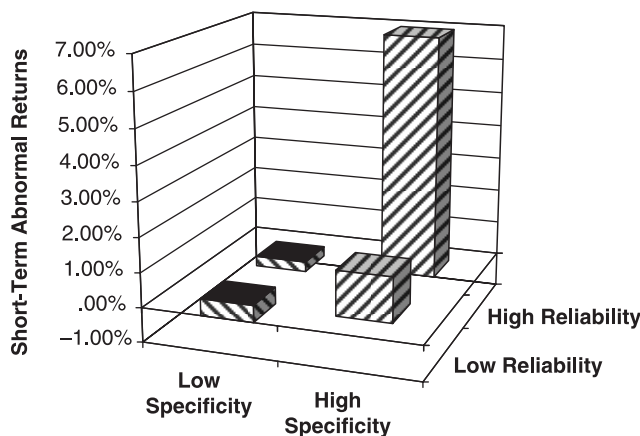


Figure 2
SHORT-TERM MARKET-ADJUSTED ABNORMAL RETURNS



firms in our sample to four different portfolios based on the values of the two variables of interest: preannouncement updating and preannouncement reliability. Within each portfolio, we measure the long-term abnormal returns using the four-factor model.

Panel B of Table 5 shows the returns of portfolios formed according to preannouncement updating and preannouncement reliability. For expositional ease, we label each cell in Panel B as (a)–(d); for example, Cell (c) refers to the portfolio of firms that have low preannouncement updating and high reliability. The highest long-term abnormal returns appear in Cell (d), for stocks of firms with both high updating and high reliability. After we control for the risk factors and the momentum effect, these stocks earn more than 34% abnormal returns per year. Conversely, the abnormal returns for stocks in Cells (a), those with low preannouncement updating and low reliability, are smaller and nonsignificant.

To test the simple main effect of preannouncement updating, we perform pairwise comparisons of Cells (a) and (b) and of Cells (c) and (d); we present the results in the top

section of Table 5, Panel C. According to H_4 , the abnormal returns in Cell (b) should be significantly higher than those in Cell (a), and the abnormal returns in Cell (d) should be significantly higher than those in Cell (c). That is, after we control for reliability, greater updating should lead to higher returns. We find that both differences are statistically significant at the 1% level or better, suggesting that preannouncement updating has a positive effect on long-term abnormal returns, in support of H_4 . We note that the calendar-time portfolio abnormal returns account for firm size, risk, and momentum by design but do not account for the other control variables included in the short-term regression: innovativeness, product category, and spokesperson. However, because none of these control variables significantly affect the short-term abnormal returns—despite the relevant information being available at the time of the preannouncement—we do not expect them to affect the long-term abnormal returns.

To test H_5 , or the moderating effect of reliability on the relationship between preannouncement updating and long-term abnormal returns, we must show that the difference in abnormal returns between Portfolios (d) and (c) is higher than that between Portfolios (b) and (a). That is, we need to show that the effect of updating is stronger at high levels of preannouncement reliability. This test is equivalent to showing that the difference between Cell (d) and Cell (b) is greater than that between Cell (c) and Cell (a); that is, the effect of preannouncement reliability on long-term abnormal returns is stronger at high levels of preannouncement updating. We present the results of this test in the bottom section of Table 5, Panel C. The abnormal returns correspond to those of a hedge portfolio that takes long positions in Portfolios (d) and (a) and short positions in Portfolios (b) and (c). Consistent with H_5 , we find a significant, positive abnormal return for this hedge portfolio, indicating that the difference in returns between Portfolios (d) and (c) is greater than that between Portfolios (b) and (a) by approximately 12% per year. Moreover, this difference is statistically significant ($p < .05$).

For completeness, in the middle section of Table 5, Panel C, we also include a test of the main effect of reliability, though it is not a part of our formal hypotheses. Recall that we expect the effect of reliability to be fully incorporated in the short-term returns because this information is available at the time of the preannouncement. The difference in abnormal returns between Cells (c) and (a) is not statistically significant for either the three-factor or the four-factor models ($p > .10$), suggesting the absence of a main effect of preannouncement reliability on long-term returns.

Because some of the returns in Table 5, Panel B, are large in magnitude, a natural question arises as to whether investors could have earned those abnormal returns *ex ante*. The largest returns are associated with stocks having high preannouncement updating levels. Because the actual realization of preannouncement updating cannot be predicted on the day of the preannouncement, it is unlikely that investors could have realized these returns *ex ante*.

Robustness Checks

We performed several robustness checks on our results. First, we examined whether preannouncement reliability is correlated with preannouncement updating. Presumably, the reliable firms have greater incentives to update investors on

Table 5
RESULTS FROM THE FOUR-FACTOR MODEL: PORTFOLIO ANALYSIS OF LONG-TERM CALENDAR-TIME ABNORMAL RETURNS FOLLOWING THE PRODUCT PREANNOUNCEMENT DATE

<i>A: Average Abnormal Returns Across the Entire Sample</i>					
Postevent portfolio-based calendar-time one-year abnormal returns					14.10%*** (5.07)
<i>B: Average Abnormal Returns Within Each Portfolio</i>					
		<i>Preannouncement Updating</i>			
		<i>Low</i>		<i>High</i>	
Preannouncement reliability	Low	(a)	7.86% (4.95)	(b)	20.90% (6.86)***
	High	(c)	9.37% (6.07)	(d)	34.88% (8.93)***
<i>C: Differences in Abnormal Returns Between Portfolios</i>					
		<i>Portfolio with "Long" (or "Buy") Positions</i>	<i>Portfolio with "Short" (or "Sell") Positions</i>		<i>Difference in Returns Between "Long" and "Short" Portfolios</i>
<i>Preannouncement Updating Significantly Affects Long-Term Abnormal Returns</i>					
(b) – (a)	Low reliability and high updating		Low reliability and low updating		13.04% (5.96)**
(d) – (c)	High reliability and high updating		High reliability and low updating		25.51% (6.84)***
<i>Preannouncement Reliability Does Not Significantly Affect Long-Term Abnormal Returns</i>					
(c) – (a)	High reliability and low updating		Low reliability and low updating		1.51% (7.83)
(d) – (b)	High reliability and high updating		Low reliability and high updating		13.98% (8.01)*
<i>Preannouncement Reliability Has a Moderating Effect on the Relationship Between Preannouncement Updating and Long-Term Abnormal Returns</i>					
(d) + (a) – (b) – (c)					12.47% (5.75)**

* $p < .10$.** $p < .05$.*** $p < .01$.

Notes: Standard errors appear in parentheses below each measure.

the progress of their preannounced product. However, the correlation between preannouncement reliability and updating is not significantly different from zero ($p > .10$).

Second, we reestimated our models using alternative measures of reliability that were based on the most recent two and three new product preannouncements made by the same firm. Although these measures resulted in a significant reduction in sample size, the signs and substantive magnitudes of the various effects on abnormal returns remained unchanged. However, a few effects were not significant ($p > .10$), possibly because of the lower power resulting from the reduced sample size.

Third, we estimated our models for various subsamples. The results for the subsample of hardware preannouncements are similar to those of the overall sample. The results for the subsample of software preannouncements also are consistent with those of the overall sample, with the exception of the main effect of specificity, which remains positive but attains significance in only one of the four models. This finding can be explained by the fact that software preannouncements are typically viewed as leading sources of vaporware and their content is highly discounted. Alternatively, the weak statistical significance may reflect the loss

of power resulting from splitting the sample. In support of this conjecture, we note that the estimate of the specificity variable remains positive and similar in magnitude to that obtained with the entire sample. We also estimated our models on a subsample that excludes all preannouncements made by Microsoft, which is notorious for vaporware (Desmond 2005), and found the results to be similar to those of the overall sample. We found only weak support for H_3 in the subsample analyses in the sense that the point estimate of the hedge portfolio intercept remains positive (as expected) and similar in magnitude to that of the entire sample but no longer attains statistical significance. Again, we conjecture that this is caused by a loss of power resulting from smaller sample sizes.

Fourth, to control for the possible effect of new product introduction on abnormal returns, we performed subsample analyses of new product preannouncements. These analyses appear in Appendix C.

DISCUSSION, CONTRIBUTIONS, LIMITATIONS, AND FURTHER RESEARCH

The goal of this article is to provide a framework and methodology for assessing the timing, magnitude, and

determinants of financial returns to new product preannouncements. Building on information asymmetry and rational learning theories, we developed hypotheses on the timing and determinants of stock market abnormal returns from preannouncements. The empirical results based on a sample of software and hardware new product preannouncements show that the financial returns from preannouncements are not significantly different from zero in the short run but are significantly positive in the long run, averaging approximately 13% during the one year after the preannouncement or up to introduction, whichever comes first.

The results also reveal that the more specific the content of a preannouncement, the higher are the stock returns in the short run. Furthermore, updating investors after the preannouncement leads to higher stock returns in the long run. However, this finding does not mean that firms should provide updates at any cost, even with unreliable information, because doing so can damage their reputations and have a detrimental effect on their future market values. We also uncover the role of preannouncement reliability in moderating the relationship between preannouncement specificity and short-term abnormal returns and the relationship between preannouncement updating and long-term abnormal returns. These relationships are stronger for firms with greater preannouncement reliability.

The findings support the predictions of the structural uncertainty theory. Consistent with this theory, we find that the average abnormal returns in the short run are zero, whereas the average long-term abnormal returns are positive. This finding suggests that investors update their initial beliefs and gradually revise their cash flow expectations as they increase their understanding of the economic effects of the preannouncement. At the time of the preannouncement, investors face substantial uncertainty about the ultimate prospects of the product introduction. Changes can arise after the preannouncement, including the possibility that the product will never be launched. Faced with this uncertainty, investors are likely to discount significantly the expected cash flows from the proposed new product. As the firm updates the market after the preannouncement, this uncertainty is reduced over the long run, resulting in positive abnormal stock returns during the one year following the preannouncement. In addition, the results show that preannouncement reliability has a higher correlation with the likelihood of introduction than preannouncement specificity, underscoring investors' lack of structural knowledge at the time of the preannouncement.

Contributions to Research

Our study makes an important contribution to research on innovation. We extend prior research on the relationship between product innovation and firm value. Such research shows that there are positive financial returns to new product introductions (Bayus, Erickson, and Jacobson 2003; Chaney, Devinney, and Winer 1991; Pauwels et al. 2004; Sorescu, Chandy, and Prabhu 2003; Srinivasan et al. 2004). Our study suggests that firms can accelerate these returns by preannouncing the new products with specific information, keeping their preannouncement promises, and periodically updating investors.

We obtain our results by using a new-to-marketing methodology for assessing long-term abnormal stock returns: the calendar-time portfolio methodology. This tech-

nique has been extensively used in finance to measure the long-term returns to corporate events and strategies (see Table 1). It offers several desirable features, such as unbiased estimates of long-term abnormal returns and the ability to control for cross-correlation among events, making it appropriate for a broad range of marketing events and strategies.

Finally, the results add new insights to extant research on vaporware. Previous research has argued that intentional vaporware could be used to deter entry (Bayus, Jain, and Rao 2001). The results suggest that though this is possible, doing so will likely reduce the abnormal returns to future preannouncements for a typical firm. When a firm is known to have produced vaporware, positive financial returns to its future preannouncements may not materialize. Therefore, although vaporware can deter entry in the short run, it might be detrimental to firm value in the long run. However, Microsoft may be an exception. Despite a spate of vaporware announcements, Microsoft does not appear to have suffered any significant erosion in its shareholder value, possibly because investors have adjusted their expectations as a result of their experience with the firm over a long period of time (Desmond 2005).

Implications for Practice

The results also have several managerial implications regarding how companies should position themselves in the marketplace. The findings, which focus on two variables that managers can easily control—the specificity of the preannouncement message and the reliability of the information released—suggest a set of clear guidelines for successful preannouncements. Managers should wait to preannounce their new products until they are reasonably certain that they can fulfill their promises. They should also wait to preannounce until they have accurate information about the new product, particularly if the firm has failed to deliver on previous preannouncement promises. To realize any short-term abnormal returns, managers should provide investors with truthful information about the product, including details on its price and introduction date. After the preannouncement, they may wish to provide periodic updates, so that market participants can adjust their expectations about the upcoming product.

It could be argued that products with the highest number of updates are also the ones with the highest market potential and that this potential is partly the reason for the positive long-term abnormal returns we uncover. However, our short-term analysis offers some evidence that this is not necessarily the case. To the extent that the innovativeness of the preannounced products is an indication of market potential and given that innovativeness does not have a significant effect on short-term returns, investors appear to ignore the market potential in their reactions to the product preannouncement. In addition, we find that the level of subsequent updating is not correlated with either the innovativeness variable ($\rho = .07, p = .32$) or the short-term returns ($\rho = -.05, p = .15$), which indicates that potentially important products are not the only ones to be updated. If there are at least some potentially important products for which firms do not issue updates, our long-term return analysis demonstrates that these products do not earn any abnormal returns. Even if innovativeness does not perfectly capture all aspects of market potential, we can still ask why

investors would ignore this potential in the short run but then acknowledge it and incorporate it in the long-term returns if it were not for the updating information? Whether updating helps investors understand this market potential or reduces the uncertainty associated with the initial preannouncement is beyond the scope of our analysis. We simply show that truthful updating that conveys favorable news about the product leads to a significant increase in long-term stock returns.

Fortune favors the prepared firms. Consistent with previous findings indicating that firms that can accurately forecast the behavior of market participants perform better (Glazer, Steckel, and Winer 1989), the results imply that managers who are confident about a new product should preannounce it because doing so will result in higher long-term market valuation for their corporations.

Limitations and Further Research

Our study has some limitations that could be addressed by further research. First, we examine new product preannouncements in the software and hardware industries. It would be useful to extend our study to other industries, such as pharmaceuticals and biotechnology, in which preannouncements are also common. Second, it would be worthwhile to study how the market reacts when information about products under development leaks before firms are ready to share this information. Third, studying new product preannouncements in industries in which an objective measure of the innovativeness of the product is available (e.g., the pharmaceutical industry, in which the type of Food and Drug Administration review—priority or standard—can be used as an indicator of the newness of the product relative to existing drugs) would yield additional insights on the impact of innovativeness on preannouncement returns.

Whether managers are enthusiastic or reluctant to preannounce, we believe that our study provides useful tools and insights for making informed new product preannouncement decisions. We also hope that the findings offer researchers the impetus to examine the long-term financial value of other types of marketing announcements and strategies.

APPENDIX A: MEASUREMENT OF SHORT-TERM ABNORMAL RETURNS

The event study method entails computing a separate measure of abnormal returns for each event under study. We use a narrow time window surrounding the event (typically five days) in the computation of short-term abnormal returns. During each day in the event window, we compute abnormal returns as the difference between the realized stock returns and the returns that would have obtained had the preannouncement not occurred (the “expected” returns):

$$(A1) \quad AR_{it} = R_{it} - E\{R_{it}|\Omega_{t-1}\},$$

where R_{it} is the daily return of firm i on day t and $E\{R_{it}|\Omega_{t-1}\}$ is the expected return of firm i on day t given the information set Ω available on day $t - 1$. In general, the expected return is estimated using either the market model or the market-adjusted model (Brown and Warner 1985).

In the case of the market model, the expected return is given by

$$(A2) \quad E\{R_{it}|\Omega_{t-1}\} = \hat{\alpha} + \hat{\beta}R_{mt},$$

where R_{mt} is the return on the stock market index on day t and α and β are the parameters estimated from an ordinary least squares regression of R_{it} on R_{mt} during the 100 trading days before the preannouncement.

In the case of the market-adjusted model, the proxy for expected returns is the average return of the entire stock market, R_{mt} , which can be expressed as

$$(A3) \quad E\{R_{it}|\Omega_{t-1}\} = R_{mt}.$$

The daily abnormal returns are then cumulated over the five-day event window, resulting in one measure of CAR for each event, given by

$$(A4) \quad CAR_{i(-2, 2)} = \sum_{t=-2}^2 AR_{it}.$$

Finally, to obtain a single CAR estimate for the whole sample, we compute the cross-sectional average of all event-specific CAR_i measures and assess the statistical significance of the sample mean using the cross-sectional standard error.

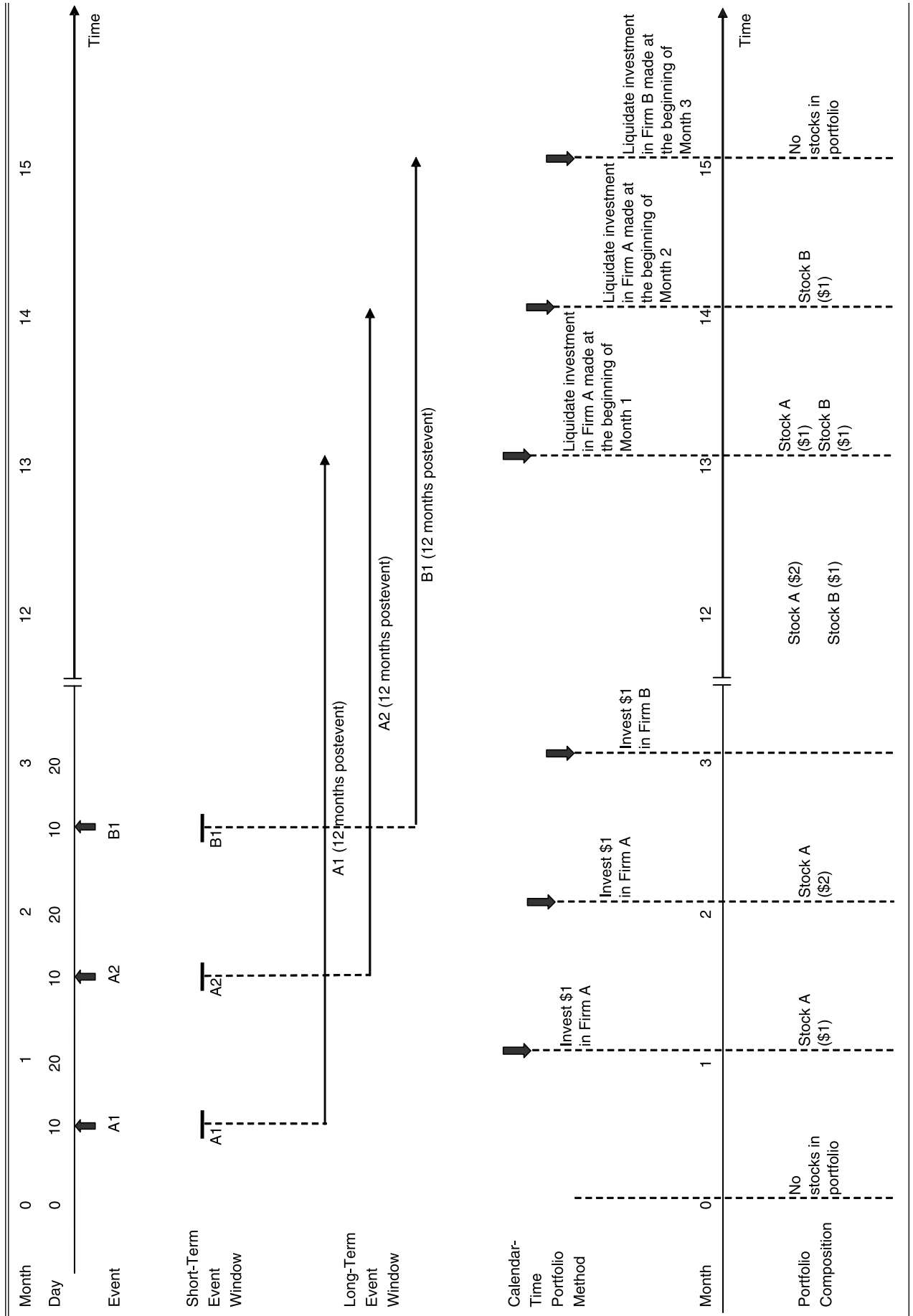
APPENDIX B: MEASUREMENT OF LONG-TERM ABNORMAL RETURNS USING THE CALENDAR-TIME PORTFOLIO METHODOLOGY

Before we introduce the concept of calendar-time portfolios, we address the limitations of the short-term event study methodology. Consider the following example illustrated in Figure B1. The figure shows a time line composed of days and months, in which we assume that each month contains exactly 20 trading days. Suppose that there are three preannouncements made by two firms, A and B. Firm A makes two preannouncements, one on Day 10 of Month 0 and the other on Day 10 of Month 1. Firm B makes a single preannouncement on Day 10 of Month 2. We refer to these three events as A1, A2, and B1, respectively. For now, assume that we are interested in measuring only the short- and long-term average stock market reactions to the three preannouncements.

There are three separate sections in Figure B1. At the top of the figure immediately below the time line, we illustrate the application of the event study methodology for measuring short-term abnormal returns. In the middle section, we illustrate how the same event study methodology could be employed to measure long-term returns, but we argue that this method fails to account for the overlap between event windows and therefore is unusable in our study. Instead, we propose the calendar-time portfolio method as a better alternative and illustrate it in the lower section of the figure.

If we wanted to apply the short-term event study methodology to long-term returns, we would compute for each event abnormal returns for the 12-month period immediately following the event window, as illustrated in the middle section of Figure B1. However, as is apparent from this figure, this would produce a significant overlap between the three event windows, which would lead to significant cross-sectional correlations among the three abnormal-return measures. Not only will the returns that follow Events A1 and A2 be correlated (because, by construction, they share an 11-month common measurement period), but the returns of Event B1 could also be correlated with the other two because of potential market- or industrywide events during that period. The cross-sectional correlation causes the stan-

Figure B1
AN ILLUSTRATION OF SHORT- AND LONG-TERM ABNORMAL RETURNS COMPUTATION



dard errors to be biased toward zero, resulting in inflated t-statistics and misleading statistical inference (Mitchell and Stafford 2000). Note that this cross-sectional correlation is not a major problem for short-term horizons, because in general, there is little overlap between the short-term event windows, as the top of Figure B1 illustrates.

To address the cross-sectional correlation problem, following the finance literature, we lump all events into a single portfolio before computing abnormal returns. The calendar-time portfolio method produces a single abnormal-return measure for the entire sample, unlike the several event-specific measures produced by the event study method.

The calendar-time portfolio is a hypothetical portfolio in which we gradually “purchase” stocks after each preannouncement and hold them for a predetermined period (in this case, one year). Because the methodology typically uses monthly returns, we add stocks to the portfolio on the first trading day of the month following each event date. The portfolio is equally weighted and rebalanced monthly, meaning that the same dollar amount is invested in each stock at the beginning of each month.

The only exceptions to the one-year holding period are the 37 observations for which we are able to identify an exact introduction date and the additional 41 observations for which we have an approximate date of introduction. In both cases, firms are kept in the portfolio up to that particular date of introduction if such an event occurs within the one-year window; otherwise, firms are kept for the full year as with the rest of the sample. We use this method to ensure that we do not capture abnormal returns that are due to the performance of the product itself (after the introduction). Instead, we attempt to capture the abnormal returns that arise from investors’ expectations of the effect of the preannouncement decision on the firm’s future cash flows.

The bottom section of Figure B1 illustrates the construction of the calendar-time portfolio. During Month 0, there are no stocks in the portfolio, because the first event occurs in the middle of the month. At the beginning of Month 1, we invest one dollar in Stock A to account for the long-term effect of Event A1. Thus, during Month 1, the portfolio’s only position is in Stock A, and the number of shares is kept constant throughout the month.

To account for the long-term effects of Event A2, we invest another dollar in Stock A at the beginning of Month 2, so that during Month 2, the portfolio holds a two-dollar position in Stock A. To account for the effects of Event B1, we invest one dollar in Stock B at the beginning of Month 3. The portfolio now contains a two-dollar position in Stock A and a one-dollar position in Stock B, and these positions are maintained during the next 9 months because there are no new preannouncement events. At the beginning of Month 13, we liquidate the first one-dollar position in Stock A to reflect the end of the 12-month period following Event A1. In the following month, we liquidate the second one-dollar position in Stock A, leaving only a one-dollar position in Stock B in the portfolio. Finally, when the one-year measurement period associated with Event B1 is over (at the beginning of Month 15), we liquidate the remaining stock, leaving no holdings in the portfolio. After constructing the calendar-time portfolio, we measure its abnormal returns using the three- or four-factor models we outlined previously in the article.

Suppose now that we wish to find out why some preannouncements generate better returns than others; that is, we wish to measure the impact of an independent variable on portfolio-level returns. In such a case, we divide our events into two groups based on the value of the respective independent variable, and we form a calendar-time portfolio for each event group. The first group contains all events whose values on the independent variable of interest are at least equal to the sample median. The second group contains below-median events. By comparing the intercepts from the two groups, we can determine the effect of the independent variable on long-term abnormal returns to preannouncements.

Importantly, the calendar-time portfolio method has the advantage of offering unbiased estimates of long-term returns. Mitchell and Stafford (2000) show that if a random series of simulated events (with both positive and negative consequences on stock returns) is imputed to a random sample of firms, the average one-year calendar-time portfolio abnormal return for this sample will be zero. This finding suggests that the average informational effect of all idiosyncratic events that firms may experience during the measurement period is, on average, zero, and any nonzero effects can be attributed to the event studied.

APPENDIX C: ADDITIONAL ROBUSTNESS TESTS

First, we repeated our long-term analysis using the three-factor model in Equation 2. The results are consistent with those we obtained with the four-factor model. The one exception is the moderating role of reliability on long-term abnormal returns, which is now marginally significant only at the 10% level. We present these results in Table C1.

Second, to control for the possible effect of new product introduction on abnormal returns, we performed subsample analyses of new product preannouncements. We compute both the short- and the long-term abnormal returns for the subsample of preannouncements that were followed by formal introduction announcements and for the subsample of preannouncements for which we found evidence of introduction. The results appear in Panel 1 of Table C2. In neither case are the short-term abnormal returns significantly different from zero, though they appear to be higher than the average of the entire sample (however, the power of the test for a sample of 37 observations is markedly low). Moreover, the short-term returns to the introduction announcements are not significantly different from zero ($p > .10$). This finding suggests that investors do not accurately predict which products will eventually be introduced. If they did, the returns to this subsample of preannouncements would be positive. However, the long-term abnormal returns to these subsamples are significantly different from zero ($p < .10$). These results provide additional support for the main finding of this study; namely, there are positive financial rewards to new product preannouncements, but they accrue only in the long run.

Panel 2 of Table C2 presents descriptive statistics for the subsample of preannounced products for which we were able to verify introduction. The proportion of firms with high preannouncement reliability in this subsample is significantly greater than the one in the overall sample, suggesting that the preannouncement reliability of a firm could be an indicator of the likelihood of introduction. However, investors did not appear to factor reliability into their expect-

Table C1
RESULTS FROM THE THREE-FACTOR MODEL: PORTFOLIO ANALYSIS OF LONG-TERM CALENDAR-TIME ABNORMAL RETURNS FOLLOWING THE PRODUCT PREANNOUNCEMENT DATE

1: Average Abnormal Returns Across the Entire Sample					
Postevent portfolio-based calendar-time one-year abnormal returns					12.89%*** (4.85)
2: Average Abnormal Returns Within Each Portfolio					
		Preannouncement Updating			
		Low		High	
Preannouncement reliability		(a)	(b)	(c)	(d)
	Low	6.22% (4.76)		9.15% (6.02)	20.03% (6.51)***
	High				34.17% (8.65)***
3: Differences in Abnormal Returns Between Portfolios					
		Portfolio with "Long" (or "Buy") Positions	Portfolio with "Short" (or "Sell") Positions	Difference in Returns Between "Long" and "Short" Portfolios	
<i>Preannouncement Updating Significantly Affects Long-Term Abnormal Returns</i>					
(b) – (a)	Low reliability and high updating		Low reliability and low updating	13.80% (5.33)**	
(d) – (c)	High reliability and high updating		High reliability and low updating	25.02% (6.74)***	
<i>Preannouncement Reliability Does Not Significantly Affect Long-Term Abnormal Returns</i>					
(c) – (a)	High reliability and low updating		Low reliability and low updating	2.93% (7.67)	
(d) – (b)	High reliability and high updating		Low reliability and high updating	14.14% (7.53)*	
<i>Preannouncement Reliability Has a Marginally Significant Moderating Effect on the Relationship Between Preannouncement Updating and Long-Term Abnormal Returns</i>					
(d) + (a) – (b) – (c)				11.21% (5.71)*	

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Notes: Standard errors appear in parentheses below each measure.

tations, as suggested by the lack of a simple main effect of preannouncement reliability in Table 4. Alternatively, there does not appear to be a difference in the specificity of preannouncements between the sample containing preannouncements of products eventually introduced and the overall sample, even though specificity was a significant determinant of short-term abnormal returns.

REFERENCES

- Agrawal, Jagdish and Wagner A. Kamakura (1995), "The Economic Worth of Celebrity Endorsers: An Event Study Analysis," *Journal of Marketing*, 59 (July), 56–62.
- Akerlof, George A. (1970), "The Market for Lemons: Quality Uncertainty and the Market Mechanism," *Quarterly Journal of Economics*, 84 (3), 488–500.
- Anderson, Eugene W., Claes Fornell, and Sanal K. Mazvancheryl (2004), "Customer Satisfaction and Shareholder Value," *Journal of Marketing*, 68 (October), 172–85.
- Asquith, Paul, Parag A. Pathak, and Jay R. Ritter (2005), "Short Interest, Institutional Ownership, and Stock Return," *Journal of Financial Economics*, 78 (2), 243–76.
- Barber, Brad M. and John D. Lyon (1997), "Firm Size, Book-to-Market Ratio, and Security Returns: A Holdout Sample of Financial Firms," *Journal of Finance*, 52 (2), 875–83.
- Bayus Barry L., Gary Erickson, and Robert Jacobson (2003), "Financial Rewards of New Product Introductions," *Management Science*, 49 (2), 197–210.
- , Sanjay Jain, and Ambar G. Rao (2001), "Truth or Consequences: An Analysis of Vaporware and New Product Announcements," *Journal of Marketing Research*, 38 (February), 3–13.
- Beatty, Randolph P. and Jay Ritter (1986), "Investment Banking, Reputation and Underpricing of Initial Public Offerings," *Journal of Financial Economics*, 15 (1–2), 213–32.
- Bergen, Mark, Shantanu Dutta, and Orville C. Walker (1992), "Agency Relationship in Marketing: A Review of Implications and Applications of Agency and Related Theories," *Journal of Marketing*, 56 (July), 1–24.
- Brav, Alon and J.B. Heaton (2002), "Competing Theories of Financial Anomalies," *Review of Financial Studies*, 15 (2), 575–606.
- Brennan, Michael and Yihong Xia (2001), "Assessing Asset Pricing Anomalies," *Review of Financial Studies*, 14 (4), 905–942.

Table C2
ANALYSIS OF PREANNOUNCEMENTS FOLLOWED BY VERIFIED PRODUCT INTRODUCTIONS

Sample	Number of Observations	1: Abnormal Returns ^a			
		Short-Term Abnormal Returns		Long-Term Abnormal Returns	
		Market-Adjusted Model (%)	Market Model (%)	Three-Factor Model (%)	Four-Factor Model (%)
Preannouncement followed by a formal product introduction announcement	37	1.25 (1.20)	.92 (1.20)	25.47 (10.00)**	18.08 (9.94)*
Return on preannouncement		.20 (.83)	-.18 (.85)		
Return on introduction					
Preannouncement for a new product with confirmed introduction	78	.84 (.81)	.59 (.80)	13.47 (7.67)*	15.26 (8.32)*

Sample	Number of Observations	2: Descriptive Statistics on the Breakdown of the Sample ^b				
		Percentage of Observations for Which the Corresponding Independent Variable Dummy Equals Unity				
		Reliability (%)	Specificity (%)	Reliability × Specificity (%)	Updating (%)	Reliability × Updating (%)
Entire sample	341	13.1	43.4	6.2	32.3	3.8
Preannouncement followed by a formal product introduction announcement	37	27.3 (8.08)**	37.8 (8.57)	6.1 (4.35)	94.6 (4.49)**	24.2 (7.72)**
Preannouncement for a new product with confirmed introduction	78	23.1 (5.55)**	44.9 (6.16)	7.69 (3.51)	97.4 (3.03)***	21.5 (5.36)**

* $p < .10$.** $p < .05$.*** $p < .01$.^aStandard errors appear in parentheses below each measure.^bStandard errors of the differences between the subsample and the full sample appear in parentheses below each subsample measure.

Brockhoff, K. and Vithala Rao (1993), "Toward a Demand Forecasting Model for Preannounced New Technological Products," *Journal of Engineering and Technology Management*, 10 (3), 211–28.

Brown, Stephen J. and Jerold B. Warner (1985), "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics*, 14 (1), 3–31.

Carhart, M. (1997), "On Persistence in Mutual Fund Performance," *Journal of Finance*, 52 (1), 57–82.

Chaney, Paul K., Timothy M. Devinney, and Russell S. Winer (1991), "The Impact of New Product Introductions on the Market Value of the Firm," *Journal of Business*, 64 (4), 573–610.

Desmond, Paul (2005), "Microsoft Math," (accessed February 8, 2006), [available at <http://redmondmag.com/features/article.asp?EditorialsID=465>].

Devinney, Timothy M. (1992), "New Products and Financial Risk Changes," *Journal of Product Innovation Management*, 9 (3), 222–31.

Diether, Karl B., Christopher J. Malloy, and Anna Scherbina (2002), "Differences of Opinion and the Cross-Section of Stock Returns," *Journal of Finance*, 57 (5), 2113–41.

Eckbo, Espen B. (1986), "Valuation Effects of Corporate Debt Offerings," *Journal of Financial Economics*, 15 (1–2), 119–51.

Eisenhardt, Kathleen M. (1989), "Agency Theory: An Assessment and Review," *Academy of Management Review*, 14 (1), 57–74.

Eliashberg, Jehoshua and Thomas S. Robertson (1988), "New Product Preannouncing Behavior: A Market Signaling Study," *Journal of Marketing Research*, 25 (August), 282–92.

Fama, Eugene and Kenneth French (1993), "Common Risk Factors in Returns on Stocks and Bonds," *Journal of Financial Economics*, 33 (1), 3–56.

Farrell, Joseph (1987), "Cheap Talk, Coordination, and Entry," *RAND Journal of Economics*, 18 (1), 34–39.

——— and Garth Saloner (1986), "Installed Base and Compatibility: Innovation, Product Preannouncements and Predation," *American Economic Review*, 76 (5), 940–55.

Fombrun, Charles and Mark Shanley (1990), "What's in a Name? Reputation Building and Corporate Strategy," *Academy of Management Journal*, 33 (2), 233–58.

Friedman, Benjamin (1979), "Optimal Expectations and the Extreme Information Assumptions of 'Rational Expectations' Macromodels," *Journal of Monetary Economics*, 5 (1), 23–41.

Geyskens, Inge, Katrijn Gielens, and Marnik G. Dekimpe (2002), "The Market Valuation of Internet Channel Additions," *Journal of Marketing*, 66 (April), 102–119.

Glazer, Rashi, Joel H. Steckel, and Russell S. Winer (1989), "The Formation of Key Marketing Variable Expectations and Their Impact on Firm Performance: Some Experimental Evidence," *Marketing Science*, 8 (1), 18–34.

Gompers, Paul A., Joy L. Ishii, and Andrew Metrick (2003), "Corporate Governance and Equity Prices," *Quarterly Journal of Economics*, 118 (1), 107–155.

Greenleaf, Eric A. and Donald R. Lehmann (1995), "Reasons for Substantial Delay in Consumer Decision Making," *Journal of Consumer Research*, 22 (2), 189–99.

- Hemp, Paul (2001), "Managing for the Next Big Thing," *Harvard Business Review*, 79 (1), 130–39.
- Hendricks, Kevin B. and Vinod R. Singhal (1997), "Delays in New Product Introductions and the Market Value of the Firm: The Consequences of Being Late to the Market," *Management Science*, 43 (4), 422–36.
- Holmstrom, Bengt (1979), "Moral Hazard and Observability," *Bell Journal of Economics*, 10 (1), 74–91.
- Horsky, Dan and Patrick Swyngedouw (1987), "Does It Pay to Change Your Company's Name? A Stock Market Perspective," *Marketing Science*, 6 (4), 320–35.
- Houston, Mark B. and Shane A. Johnson (2000), "Buyer–Supplier Contracts Versus Joint Ventures: Determinants and Consequences of Transaction Structure," *Journal of Marketing Research*, 37 (February), 1–15.
- Hoxmeier, John A. (2000), "Software Preannouncements and Their Impact on Customers' Perceptions and Vendor Reputation," *Journal of Management Information Systems*, 17 (1), 115–39.
- Jacoby, Jacob, James Jaccard, Imran Currim, Alfred Kuss, Asim Ansari, and Tracy Troutman (1994), "Tracing the Impact of Item-by-Item Information Accessing on Uncertainty Reduction," *Journal of Consumer Research*, 21 (2), 291–303.
- Jegadeesh, Narasimhan and Sheridan Titman (1993), "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency," *Journal of Finance*, 48 (1), 65–91.
- John, Kose and Joseph Williams (1985), "Dividends, Dilution and Taxes: A Signaling Equilibrium," *Journal of Finance*, 40 (4), 1053–1070.
- Kirmani, Amna and Akshay R. Rao (2000), "No Pain, No Gain: A Critical Review of the Literature on Signaling Unobservable Product Quality," *Journal of Marketing*, 64 (April), 66–79.
- Knight, Frank H. (1921), *Risk, Uncertainty and Profit*. Boston: Hart, Schaffner & Marx/Houghton.
- Kothari, S.P. and Jerold B. Warner (in press), "The Econometrics of Event Studies," in *Handbook in Empirical Corporate Finance*, Chap. 1, B. Espen Eckbo, ed. North Holland: Elsevier.
- Kurz, Mordecai (1994), "On Rational Belief Equilibria," *Economic Theory*, 4 (6), 859–76.
- Lane, Vicki and Robert Jacobson (1995), "Stock Market Reaction to Brand Extension Announcements: The Effect of Brand Attitude and Familiarity," *Journal of Marketing*, 59 (January), 63–77.
- Lewellen, Jonathan and Jay Shenken (2002), "Learning, Asset-Pricing Tests and Market Efficiency," *Journal of Finance*, 57 (3), 1113–45.
- Lewis, Karen K. (1989), "Changing Beliefs and Systematic Rational Forecasts Errors with Evidence from Foreign Exchange," *American Economic Review*, 79 (4), 612–36.
- Loughran, Tim and Jay R. Ritter (1995) "The New Issues Puzzle," *Journal of Finance*, 50 (1), 23–51.
- Lyon, John D., Brad M. Barber, and Ching-Ling Tsai (1999), "Improved Methods for Tests of Long-Run Abnormal Stock Return," *Journal of Finance*, 54 (1), 165–201.
- Merton, Robert C. (1987), "A Simple Model of Capital Market Equilibrium with Incomplete Information," *Journal of Finance*, 52 (3), 483–510.
- Michaely, Roni, Richard H. Thaler, and Kent L. Womack (1995), "Price Reactions to Dividend Initiations and Omissions," *Journal of Finance*, 50 (2), 573–608.
- Milgrom, P. and J. Roberts (1986), "Price and Advertising Signals of Product Quality," *Journal of Political Economy*, 94 (4), 796–821.
- Miller, N. and D.T. Campbell (1959), "Recency and Primacy in Persuasion as a Function of the Timing of Speeches and Measurements," *Journal of Abnormal Social Psychology*, 59 (1), 1–9.
- Mishra, Debi Prasad and Harjeet S. Bhabra (2002), "Assessing the Economic Worth of New Product Pre-Announcement Signals: Theory and Empirical Evidence," *Journal of Product and Brand Management*, 10 (2), 75–93.
- , Jan B. Heide, and Stanton G. Cort (1998), "Information Asymmetry and Levels of Agency Relationships," *Journal of Marketing Research*, 35 (August), 277–95.
- Mitchell, Mark L. and Erik Stafford (2000), "Managerial Decisions and Long-Term Stock Performance," *Journal of Business*, 73 (3), 287–329.
- Odean, Terrance and Brad M. Barber (2000), "Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors," *Journal of Finance*, 55 (2), 773–806.
- and ——— (2001), "Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment," *Quarterly Journal of Economics*, 116 (1), 261–92.
- Pauwels, Koen, Jorge Silva-Risso, Shuba Srinivasan, and Dominique M. Hanssens (2004), "New Products, Sales Promotions, and Firm Value: The Case of the Automobile Industry," *Journal of Marketing*, 68 (October), 142–56.
- Prabhu, Jaideep and David Stewart (2001), "Signaling Strategies in Competitive Interaction: Building Reputations and Hiding the Truth," *Journal of Marketing Research*, 38 (February), 62–72.
- Rao, Vithala R., Manoj K. Agarwal, and Denise Dahlhoff (2004), "How Is Manifest Branding Strategy Related to the Intangible Value of a Corporation?" *Journal of Marketing*, 68 (October), 126–41.
- Riley, John G. (2001), "Silver Signals: Twenty-Five Years of Screening and Signaling," *Journal of Economic Literature*, 34 (2), 432–78.
- Roberts Peter W. and Grahame R. Dowling (2002), "Corporate Reputation and Sustained Superior Financial Performance," *Strategic Management Journal*, 23 (12), 1077–1093.
- Robertson, Thomas S., Jehoshua Eliashberg, and Talia Rymon (1995), "New Product Announcement Signals and Incumbent Reactions," *Journal of Marketing*, 59 (July), 1–15.
- Schatzel, Kim E., Roger J. Calantone, and Cornelia Droge (2001), "Beyond the Firms Initial Declaration: Are Preannouncements of New Product Introductions and Withdrawals Alike?" *Journal of Product Innovation Management*, 18 (2), 82–95.
- Shefrin, Hersch (2005), *A Behavioral Approach to Asset Pricing*. San Diego: Elsevier Academic Press.
- Sorescu, Alina B., Rajesh K. Chandy, and Jaideep C. Prabhu (2003), "Sources and Financial Consequences of Radical Innovation: Insights from Pharmaceuticals," *Journal of Marketing*, 67 (October), 82–101.
- Spence, Michael (1973), "Job Market Signaling," *Quarterly Journal of Economics*, 87 (3), 355–74.
- Srinivasan, Raji and Sundar G. Bharadwaj (2004), "Event Studies in Marketing Strategy Research," in *Assessing Marketing Strategy Performance*, C. Moorman and D.R. Lehmann, eds. Cambridge, MA: Marketing Science Institute, 9–28.
- Srinivasan, Shuba, Koen Pauwels, Jorge Silva-Risso, and Dominique M. Hanssens (2004), "Staying Ahead in the Innovation Race: New-Product Introductions and Relative Firm Value," working paper, Anderson School of Management, University of California, Los Angeles.
- Srivastava, Rajendra K. and David J. Reibstein (2005), "Metrics for Linking Marketing to Financial Performance," working paper, Marketing Science Institute.
- , Tasadduq A. Shervani, and Liam Fahey (1998), "Market-Based Assets and Shareholder Value: A Framework for Analysis," *Journal of Marketing*, 62 (January), 2–18.
- , ———, and ——— (1999), "Marketing, Business Processes, and Shareholder Value: An Organizationally Embedded View of Marketing Activities and the Discipline of Marketing," *Journal of Marketing*, 63 (Special Issue), 168–79.
- Varian, Hal (1985), "Divergence of Opinion in Complete Markets: A Note," *Journal of Finance*, 50 (1), 309–317.

- Vermaelen Theor (1981), "Common Stock Repurchase and Market Signaling," *Journal of Financial Economics*, 9 (2), 139–83.
- Wilson, R. (1985), "Multidimensional Signaling," *Economic Letters*, 19 (1), 17–21.
- Winer, Russell S. (1986), "A Reference Price Model of Brand Choice for Frequently Purchased Products," *Journal of Consumer Research*, 13 (2), 250–56.
- Womack, K. (1996), "Do Brokerage Analysts' Recommendations Have Investment Value?" *Journal of Finance*, 51 (1), 137–67.
- Wu, Yuhong, Sridhar Balasubramanian, and Vijay Mahajan (2004), "When Is a Preannounced New Product Likely to Be Delayed?" *Journal of Marketing*, 68 (April), 101–113.
- Wyer, Robert S. and Thomas K. Scrull (1989), *Memory and Cognition in Its Social Context*. Hillsdale, NJ: Lawrence Erlbaum Associates.

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