From event-driven to period-driven Voluntary Earnings Disclosure? A value-adding disclosure strategy

Jacques Barnea

Henley Management College and Brunel University
Greenlands, Henley-on-Thames
Oxon RG9 3AU, UK
and
Chemin du Tilleul 7
1380 Lasne, Belgium
Fax: +32 2 354 20 33
E-mail: j.barnea@skynet.be

Abstract: Research and practice of Voluntary Earnings Disclosure (VED) as a strategy are limited, notwithstanding its evidenced contribution to firm value. An emerging VED profile is identified, characterised and evaluated. Firms applying it regularly provide VED between quarterly earnings announcements. This profile is compared with the prevailing approach of issuing VED when warranted by events and/or when serving firm or management ad hoc interests. These firms’ VEDs are found to be more regular, frequent, timely, and often with confirming content. Their VED events, usually midquarter updates, are often prescheduled and specifically named using period-related terms. These controllable characteristics qualify it as a strategy, termed ‘Period-Driven VED’, in distinction from ‘Event-Driven VED’.

The period-driven VED strategy is found to improve a firm’s information environment through a reduced information gap, measured by abnormal stock returns, lower analysts’ forecast error and dispersion, and fewer surprises around earnings-release dates.

The firm’s improved information environment leads to lower cost of capital, as evidenced by prior theoretical and empirical research, enhancing firm value.

Keywords: disclosure; voluntary disclosure; Voluntary Earnings Disclosure; VED; management forecast; earnings guidance; corporate financial information; information asymmetry; governance; midquarter business update.


Biographical notes: Jacques Barnea is currently completing his DBA thesis at Henley Management College, UK. His research subject is Corporate Voluntary Earnings Disclosure, focusing on an emerging ‘period-driven’ disclosure strategy. Barnea obtained MBAs from INSEAD and from Tel-Aviv University, following initial studies of Economics. A former CFO International/Europe of four US-based multinational companies, Barnea has over 20 years of financial, operational and strategic management experience, in
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several industry and service sectors. This has led him to found 3D.BI (www.3dbi.net), through which he now provides software and solutions for Business Performance Management (BPM) and Business Intelligence (BI).

1 Introduction

Research is largely supportive of a high level of firm informativeness in the financial markets. The US regulatory environment, following a shift in 1973, also encourages a high level of voluntary disclosure. Yet empirical evidence points to a majority of firms not providing voluntary disclosure. At the same time, for those firms who disclose voluntarily, a significant quantity of voluntary disclosing activity is observed. This activity is mostly concentrated around earnings guidance to the financial markets, disclosure of material events and disclosure aimed at serving firm and/or management ad hoc interests. Empirical research into VED may have been constrained and limited in several ways: lack of VED transparency prior to Fair Disclosure (FD) regulation, enacted in the USA in 2000; limited distinction between different VED types, and in particular between guidance (forecasts) and updates; scant focus on a comprehensive disclosure strategy, although theoretical research supports the need for it.

This paper focuses on time-related aspects of VED practices. Using a quantitative empirical approach, it identifies a newly emerging VED profile, characterises it as a strategy, and evaluates its potential benefits. Firms applying it regularly provide at least one VED between every two consecutive quarterly earnings release dates, most commonly midquarter earnings updates. This VED profile is compared with the prevailing approach of issuing VED when warranted by material events and/or when serving firm or management interests. In addition to regularity, the study compares these firms’ VED frequency, their timeliness, and the practices of issuing confirming VEDs, of prescheduling VED events and of naming them using period-related terms. These characteristics, controllable by the firm, may qualify it as a strategy, which will be termed ‘Period-Driven (PD) VED’, in distinction from the prevailing approach termed ‘Event-Driven (ED) VED’.

Period-driven VED is hypothesised to improve the information environment for firms applying it, through a smaller information gap, as measured by abnormal stock returns, lower analysts’ forecast error and dispersion, and fewer surprises around earnings release dates.

An improved information environment in a firm’s stock market leads to lower cost of capital, as evidenced by prior theoretical and empirical research, enhancing firm value.

Section 2 starts with a contextual review of prior literature. Section 3 outlines research definitions, questions and design. Section 4 details research results and analysis by specific hypotheses, leading to overall conclusions and suggested future research in Section 5.
2 Literature review

2.1 Disclosure, full disclosure prediction and disclosure thresholds

Ever since Fama (1970) introduced his Efficient Market Hypothesis theory, information has been at the centre of financial markets’ research, with strong emphasis on the reaction of market participants and stock returns to information.

Corporate disclosure provides an important vehicle for management to communicate firm- and industry-specific information to the market and to outside investors (Healy and Palepu, 1993). “It is critical for the functioning of an efficient capital market” (Healy and Palepu, 2000). “The primary objective of corporate disclosure is informed decision making by users” (Beaver, 1978). The discussion about information disclosure from companies to the markets is situated in the semi-efficient-market hypothesis. Public information is already reflected in market stock prices, and new information is immediately and efficiently reacted upon. Private information, held by corporate management, is not yet (fully) reflected in market prices. When it becomes public, through corporate announcements, markets react to it, as reflected by changing prices and by trade volume (Kim and Verrecchia, 1991). Corporate earnings are viewed by many as the preeminent measure of firm performance (Helfin et al., 2001), and are included, in addition to quarterly earnings releases, in most quantitative voluntary disclosures issued.

In landmark theoretical works, Milgrom (1981) and Grossman (1981) lay the starting point for research on information disclosure by sellers, and specifically for corporate information disclosure. In their full disclosure prediction, they establish that if a firm is in a position to make credible disclosure about its value to uninformed investors, the firm will disclose all of its information independently of whether such information is positive or negative. This observation is supported by the adverse selection cost argument that failing full disclosure, investors will assume that the undisclosed information is the worst possible outcome, and will fully discount it in their assessed firm’s value.

The full disclosure prediction holds when firms have credible news and when their disclosure is cost free. In reality, neither of these two conditions holds. Dye (1985) shows that if it is uncertain whether a firm has news, it will not be discounted in its share price, giving the firm the choice not to disclose bad news, pretending it does not possess any. Verrecchia (1983; 1990) also explains possible nondisclosure using disclosure cost. Disclosure cost is generated by disclosure preparation and presentation, communication, loss of proprietary information, potential litigation cost and the reduction of competitive advantage (Lang and Lundholm, 1992; Lev, 1992). Verrecchia shows that firms with sufficiently good news, whose undisclosed value is higher than their disclosure cost, will incur the cost and disclose. This creates a threshold for disclosure. Lang and Lundholm (1992) provide empirical support to Verrecchia’s model. Lev and Penman (1990) confirm that companies with good news voluntarily disclose it. However, they cannot confirm that firms in the same industries who do not disclose have particularly bad news.

2.2 The regulatory environment

The regulatory foundation for the mandatory information requirements in the USA is embedded with the Security and Exchange Commission (SEC) Securities Act of 1933 and the Securities Exchange Act of 1934. Mandatory regulated financial reports include
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the financial statements, footnotes, management discussion and analysis, and other regulatory filings. A quarterly report (10-Q) must be filed and published within 45 days of the end of the fiscal quarter, and an annual report (10-K) must be filed and published within 90 days of the end of the fiscal year.

Voluntary disclosure, as used in a Financial Accounting Standard Board (FASB) publication, is described as “disclosure, primarily outside the financial statements, that are not explicitly required by GAAP or an SEC rule” (FASB, 2001).

VED, also termed management forecasts or earnings forecasts, may be qualitative or quantitative, prospective or retrospective in nature (Lev, 1992). It may take different forms: guidance, issued ahead or early in the projected period; update or revision, issued during the projected period to change or confirm the guidance, including profit warnings; pre-announcements, typically issued after the end of the projected period but prior to its mandatory earnings announcement. It may be positive, neutral or negative in ‘tone’ and it may be an ‘independent’ announcement or ‘bundled’ with other official announcements (Miller and Piotroski, 2000).

Prior to 1973 the SEC had a prohibition policy towards management forecasts and other voluntary disclosure, on the grounds that it lacked credibility, and may even be deceptive or fraudulent. In 1973 the SEC reversed this policy and in 1978 it adopted a policy encouraging forecast disclosure (Pownall and Waymire, 1989). To protect firms from liability related to unattained forecasts prepared in ‘good faith’ and on a ‘reasonable basis’, the SEC has enacted the Safe Harbour provision of 1979 for the voluntary disclosure of financial projections and other forward-looking information. In 1995 Congress adopted a significant revision to the federal securities laws by adopting the Private Securities Litigation Reform Act. The aim was to reduce abusive litigation through several measures protecting financial projections and other forward-looking statements (Johnson et al., 1999).

FD regulation enacted in 2000 is the latest regulation with important impact on voluntary disclosure. It requires a firm disclosing any material nonpublic information to an outsider to make this information public simultaneously, or promptly in case of nonintentional disclosure, to the whole market. Its main implication is to make public previously private disclosures to analysts or other professionals. It is supposed to render the voluntary disclosure environment fully transparent for all investors. As a by-product it makes voluntary earnings disclosure transparent also for the research community.

Future SEC directions may include initiatives towards even more transparency and timeliness. This entails replacing the current concept of ‘periodic disclosure’ – disclosure every quarter – by ‘continuous disclosure’, disclosing trends and material information as soon as available to companies. Based on the premise that information is not static, and that waiting for the quarterly report is not the best that can be offered to investors, this concept will entail more frequent disclosure whether on a mandatory or, more likely, on a voluntary basis (Investor Relations Business, 2001a).

2.3 VED motivation, deterrents and consequences

Research enumerates several reasons motivating VED: the full disclosure prediction, discussed above, leads companies to disclose in order to minimise the adverse selection cost of their stock in their competition for capital; aligning equilibrium prices of stocks with managers’ valuations (Ajinkya and Gift, 1984; King et al., 1990); assuring that
security values and stakeholders’ perceptions reflect the overall strategy of a company and the results of its activities; correcting misvaluations between a firm’s intrinsic value and its market value – “Managers have an implicit responsibility to investors to continually maintain market values as close as feasible to intrinsic ones” (Lev, 1992); correcting analysts’ forecasts, when they deviate from management forecasts (Waymire, 1986); preventing the threat of litigation by preempting earnings disappointment or earnings decline through public early warnings (Lev, 1992); lowering expectations with the aim of subsequently beating the revised analysts’ forecast (Venkatachalam and Wang, 2000); preventing price and market manipulation, including massive dissemination of wrong information, fraudulently ‘putting words’ into the mouth of firm officials and more (Investor Relations Business, 1999).

Arguments justifying why firms limit disclosure or do not voluntarily disclose include management belief that markets are efficient and thus security prices reflect the company’s value, regardless of their disclosure (Lev, 1992); fear of litigation arising from misinterpretations of firm public announcements (Heflin et al., 2001); fear that public disclosure of details will benefit competitors (Heflin et al., 2001; Nagar, 1999), including the attraction of new entrants to the sector (Nagar, 1999); concerns and uncertainty about managers’ performance evaluation; the belief that investors will not heavily penalise nondisclosing managers (Nagar, 1999).

Extensive research addresses the consequences of VED: Pownall and Waymire (1989) find VED not less credible compared to more regulated reporting and even find larger stock price effects associated with forecasts, possibly due to timing; Waymire (1984) finds that price reactions to management forecasts are associated with the deviations of these forecasts from market expectations, both in sign and in magnitude; Lev (1992) suggests that an even flow of credible information reduces stock price volatility over time, improving the risk and liquidity characteristics of such stocks; Venkatachalam (2000) sees a dubious effect of disclosure practices on return volatility: on one hand, improved disclosure timeliness, frequency and quality could drive volatility higher due to increased rate of information arrival; on the other hand, it reduces the magnitude of surprises, thus reducing volatility; Healy et al. (1995; 1999) find that following an increase in disclosure, firms experience a reduction in undervaluation, and an increase in stock liquidity, analyst following and institutional holding, which suggest a lower cost of capital; Lang and Lundholm (1996) find that firms with more informative disclosure have a larger analyst following, more accurate analyst earnings forecasts with less dispersion between their forecasts, and less volatility in their forecast revisions. These would suggest a potential increase in investor following, reduced information asymmetry and reduced estimation risk, all theoretically leading to reduced cost of capital; Waymire (1986) finds that analysts are adjusting their forecasts in line with management forecasts, which are found to be more accurate; Lundholm and Myers (2000) find that firms with more informative disclosure “bring the future forward” better, reflecting credible relevant future earnings information in current prices and returns; Botosan (1997) finds that for firms with a lower level of analyst following, thus less information availability, greater disclosure is associated with lower cost of capital. She does not find the same association for firms with high analyst following; King et al. (1990) argue that frequent disclosure reduces investors’ need to acquire costly information, thus reducing information asymmetry and transaction costs; Skinner (1997) finds that more timely disclosure is associated with lower settlement amounts in stockholders’ litigations.
2.4 Empirical studies of time-related VED attributes

Research findings concerning the frequency of VED vary considerably as a function of the period covered, the definition and the method used, and thus do not allow for a unified conclusion: Skinner (1994) reports an average of one VED on every ten quarterly earnings releases during his 1981–1990 study period; Johnson et al. (1999) test computer, software and drug firms pre and post 1995 Securities Litigation Reform Act and find respectively 44% and 49% of firms issuing at least one forecast in a year; Kile et al. (1998) use a broader definition including all forward-looking statements disclosed prior to earnings release during ten years, and find an average of 46% disclosure level per firm-year, with annual percentage of disclosing firms ranging from 39% to 52%; Heflin et al. (2003) evidence a much higher frequency of 40% per firm-quarter post-FD, compared with 20% and 29% in two control quarters pre-FD; a National Investor Relations Institute (NIRI) survey (2001) indicates that 37% of the companies surveyed disclose earnings projections, and 78% provide earnings guidance, mostly by public conference calls.

Recent research thus presents a higher VED frequency, with guidance probably adding a frequent stream of voluntary disclosures. A majority of nondisclosing or sporadic disclosing firms are contrasted with a minority of disclosing firms whose disclosing frequency is considerable.

Miller and Piotroski (2000) identify firms which are more likely to provide voluntary disclosure. These include firms with high book-to-market value, since they are likely to have undervaluation concerns and future positive earnings news, two disclosure causes; firms that operate in high litigation industries, concerned about potential litigation if negative news is not disclosed early enough; firms possessing strong institutional ownership, subject to greater potential pressure; firms having greater stock option-based compensation, and thus insiders’ interest in preventing an undervalued stock price; firms facing larger nonequity stakeholders who look at the stock behaviour for indication about the business and the firm’s health.

2.5 Shortcomings in research of time-related VED attributes

Several shortcomings may have hindered conclusive research in time-related attributes of VED, preventing the emergence of proposed comprehensive strategies in this respect.

Prior to FD, the complete extent of VED had never been fully transparent to research. Researchers trying to assess VED frequency had often proxied analysts’ forecast revisions to represent VED. Yet such revisions may or may not have resulted from firm VEDs. The FD regulation, enacted in October 2000, constitutes a turning point in VED, making it transparent to all investors, which is its intent, but also to research.

The SEC’s timely disclosure rule requires disclosure of ‘material’, ‘non-public’ information in many situations, including (as defined by example) forecasts, which deviate materially from historical trends. Disclosures made by firms in compliance with this rule, although mandatory, overlap considerably with voluntary disclosure (Frost and Pownall, 1994; Healy and Palepu, 2000). The distinction between the two is ignored in practically all VED research, thus considering and counting as voluntary, disclosures which should be classified as mandatory. In addition, quantitative studies do not
differentiate between guidance, updates, warnings and other types of VED. The implications are that it is not always possible to distinguish between events and circumstances as opposed to strategy and policy as drivers of VED behaviour.

2.6 The theoretical underpinning of period-driven VED

Earnings related disclosure, mandatory or voluntary, is usually based upon and includes at least two major elements in varying combinations: past actual results; forward looking forecast. The information content of a disclosure, as discussed, equals the reduction in the information gap between management and the market, resulting from the disclosure. It depends mostly on the past actual results available to firm management, which is a function of the VED timing, and on management interest and willingness to communicate it, and to publish its forecast. The actual past results element, subject to (later) audit and highly regulated, provides a credible update of reality and carries relatively high information content. The forecast element, on the other hand, even if updated to reflect the latest actual results, may still be subject to business uncertainty, incompetence, intentional bias and more, as shown by past research. It is therefore discounted by market participants, reducing its implied information content. The distinction between the two information content elements of a VED may explain, or be supported by the following observations: Bundled VEDs, issued during the official earnings release event, have no information content and do not reduce information gap (Feldman et al., 2003). Since all past results are incorporated in the earnings release, the forecast element has no information content; Confirming management earnings forecasts – disclosure of no deviation from current formal expectations – have information content, resulting in reduction in analysts’ forecast dispersion, and a significantly positive market price reaction (Clement et al., 2000). Confirming VEDs carry information content by merely replacing the forecast element by an actual element, even without changing expectations. Anecdotal evidence suggests that even announcing the date of the next regular earnings release during the period leading to it, which implies that there will be no surprise pre-announcement, may have a significantly positive market price reaction. This supports the assertion that VEDs’ information content stems mostly from their past actual results element. This increases with time during the reported period.

For firms aiming at continuous transparency and low information gap, communicating regularly an up-to-date situation of their actual results will be the main driver behind their VED strategy. Such VED strategy will be period-driven as opposed to the prevailing event-driven approach. For these firms, frequency, regularity, timeliness and scheduling of VED events become fully controllable, and can be structured in a coherent strategy. Lev (1992) reviews the rarity of VED and presents the need for a disclosure strategy. He sees disclosure as an activity that provides benefits and incurs costs, and thus requires planning and a strategy. He sees such a strategy as an “even flow of credible information, as opposed to infrequent releases of highly surprising news”. He adds that the impact of VED will depend on the credibility of management, which “requires a commitment to ongoing communication with outsiders, rather than haphazard disclosure under duress.....a long term, consistent disclosure strategy, where bad (i.e., below expectations) as well as good news are disclosed”. In following Lev, an ‘ongoing’,
'even flow' of credible management information can only be achieved if such information is disclosed in regular periodic intervals, independent of the flow and the direction of events. It has to be period-driven rather than event-driven.

A period-driven VED profile will be defined as a profile of a firm that provides at least one VED between every two consecutive quarterly reporting dates. The disclosure driver for such firms is a threshold period (as defined by the firm, but shorter than a quarter), which has elapsed since the firm’s latest disclosure. For these firms VED is embedded in their strategy and is part of ongoing regular business, rather than an exceptional *ad hoc* event. Underlying this strategy is the assumption that every threshold period provides new information worthy of VED, even if it is essentially confirmatory. It also assumes that mandatory releases and non-firm sources do not (efficiently) satisfy market participants’ information requirements.

In practice, period-driven VED firms, which may or may not provide earnings guidance at their formal earnings release event, provide a midquarter or intraquarter business update. Many such updates are scheduled in advance and issued in a timely manner during the quarter or as a regular pre-announcement.

Dignan (2001) quotes some of the reasons pushing companies, and in particular technology companies, towards more frequent and regular guidance updates, in the form of midquarter VED. The major reason mentioned is FD regulation, with the resulting practice of holding public conference calls replacing or complementing private analyst discussions held previously. Several companies also mention this reason on their websites. Other reasons are the difficulty of predicting business prospects longer than a few weeks at a time, and the need to prevent analysts’ speculation about the business in the short term. Holding regular updates also replaces decisions required on whether to make special announcements in instances in which the company foresees even a small miss to its previous guidance. A planned scheduled update is usually not seen by the markets as badly as an unplanned surprise announcement. According to Dignan, the main opposition to midquarter updates comes from analysts who see it as “short-term talk that may not add up to much in the long run”.

Studies on expanded disclosure and high frequency of VED point to several potential consequences and advantages of period-driven VED:

- Disclosure issued a certain time period following the previous one is likely to be based on information accumulated during this elapsed period, unknown to the public, thus carrying information content. News with information content is likely to generate significant price movements (abnormal returns) and volume trade (Kim and Verrecchia, 1991).

- Information content disclosed by management to the public will reduce the information gap (asymmetry) between the two, in the period following the VED.

- Lower information asymmetry will reduce opportunities for inside holders of a higher information level to engage in improper trades.

- Frequent, regular and timely information updates are likely to reduce litigation related to nondisclosure of information of material influence to investors. It potentially increases litigation relative to misleading and unrealised forecasts.
Occasionally, managers engage in VED to further their own stock option-related interests, in preparation for security issuance, or with hyping intentions. Managers also time their VED depending on whether they have good or bad news. Such possibilities increase the level of suspicion and scepticism among market participants. If VED is published on frequent, regularly scheduled occasions, opportunities to time and bias VED are greatly reduced, reducing with it market scepticism about VED.

Midperiod VED is based upon, and delivers to the market, part of the information content of the formal quarterly announcement. The quarterly announcement content is thus split, with each of its elements likely to carry lower information content than the whole. Stock price shocks, which result from information shocks, are potentially less frequent and less severe.

Financial analysts base their forecasts on company information. Period-driven VED may provide them with earlier and better estimates on which to base their forecasts, which are likely to be adjusted more frequently, improving accuracy and reducing dispersion.

More accurate analyst forecasts, lower information asymmetry and lower price shocks are likely to reduce stock price volatility.

Investors value stocks based on information from firms and from analysts. In the absence of information from firms, investors assume the worst and reflect their beliefs in reducing the stock valuation and price. More and earlier information from firms, and more accurate analyst forecasts, may reduce stock misvaluations.

Reduced undervaluation, lower information asymmetry and lower volatility are likely to reduce the firm’s cost of capital.

The National Investor Relations Institute (NIRI) (2001), in its Corporate Disclosure Practices Survey 2001, reports that, of those companies surveyed who currently provide earnings guidance, 6% (27 out of 453 companies) “plan to routinely issue a mid-quarter review or guidance”. Sixty-nine percent of such companies plan to disseminate this review using a news release, and 27% (not mutually exclusive) plan to use a fully accessible conference call.

Dignan (2001) considers midquarter updates a new trend which did not exist a few quarters earlier. He quotes C. Hill, director of research for First Call, as saying “There will be mid-quarter calls and even monthly calls, incremental guidance is the wave of the future.”

In conclusion, the importance of information in general, and corporate sourced information in particular, the full disclosure prediction, the highly supportive regulatory environment and all other evidenced VED reasons and benefits, do not seem to outweigh disclosure cost and thresholds. The vast majority of listed firms either do not voluntarily disclose, or limit themselves to ad hoc and event-driven disclosure. Research has yet to advance an alternative comprehensive strategy addressing how frequently, regularly and timely, and in what circumstances firms should provide VED. The period-driven VED profile may point in this direction. This research is aimed at qualifying it as a VED strategy and assessing its advantages over the more traditional and prevailing event-driven VED.
3 Research design

The period-driven VED profile is characterised and evaluated. It is compared with the prevailing event-driven profile. In addition to their regularity, these two profiles are compared for their frequency, timeliness, the proportion of confirming VEDs, the practice of prescheduling VED events, and referring to them using period-related terms. These controllable characteristics, if confirmed, will qualify period-driven VED as a strategy. This strategy will be evaluated in comparison with event-driven VED to find out if it improves the information environment for firms applying it through a smaller information gap, as measured by abnormal stock returns, lower analysts’ forecast error and dispersion, and fewer surprises around earnings release dates.

3.1 VED profiles – definitions

A firm’s VED profile, in the context of this study, is defined by the firm’s approach and drivers to VED as portrayed by its observable, quantifiable VED activity.

A PD VED profile is defined as a profile of a firm that provides at least one VED between every two consecutive quarterly reporting dates. Such VEDs are defined as qualifying VEDs. They exclude bundled VEDs and combine multisignal VEDs into one. Bundled VEDs are issued, by definition, at the same time as earnings releases and do not include new data resulting from a new period following an earnings release. They are therefore a voluntary qualitative addition to the earnings report. The disclosure driver for PD firms is a threshold period which has elapsed since the firm’s latest disclosure.

The ED VED profile is defined as a profile of a firm that provides VED but does not qualify as a PD VED profile.

3.2 Target population of firms

The research was conducted on US firms listed on NYSE, NASDQ and AMEX stock exchanges. There were 2566 firms with reported earnings and analysts’ forecasts during the entire study period that were qualified.

3.3 Research period – timing, length and time-units

The research period covered eight reporting calendar quarters and their matching information cycles during 2001–2002. It was deliberately selected after the enactment of Regulation FD in October 2000. Regulation FD was aimed at regulating VED and had a considerable impact on it (Heflin et al., 2001; Heflin et al., 2003). In addition, PD VED, as observed, is a recent phenomenon, likely to have been started during the post-FD period. Data has been extracted covering 1 November 2000 to 28 February 2003 in order to also cover and include the 368 non-December-reporting firms during their entire information cycle.

The basic unit of analysis used is a firm/quarter. Tests were based on different quarterly period definitions as warranted by the specific hypotheses:
Firm calendar quarter – the three-month activity period being reported by the firm

Information cycle quarter – the period between two consecutive quarterly official earnings announcements

Information cycle quarter with two days lag – the information cycle quarter period starting and ending at the close of two trading days following the official earnings announcement date (itself defined as point 0). This enables capturing the full impact of the official earnings announcements on returns (Heflin et al., 2003).

3.4 Sampling and matching data

Management forecast (VED) data was obtained from the First-Call CIG (Company Issued Guidance) file. Quarterly earnings announcements data was extracted from the Thomson Financial I/B/E/S earnings information database. General firm data – industry code, market capitalisation and the number of analysts covering the stock – were obtained from the Center for Research in Security Prices (CRSP) at Graduate School of Business, the University of Chicago, for the qualifying population of 2566 firms. The data contained 15,298 VEDs issued by 1952 firms. In line with the specific VED definition described above, the following categories of VEDs were excluded:

- VEDs bundled with quarterly earnings announcements – 5,364
- VEDs combined with other VEDs, providing signals on other periods as part of the same VED event – 4,246.

This process resulted in the remaining 5,688 qualifying VEDs.

The exclusion of bundled and combined VEDs, in line with the research objective, had no influence on the sample selection and results other than results of the frequency tests, which were therefore performed both with and without bundled VEDs.

3.5 Selection of PD firms target sample

Qualifying VED data was merged with actual earning announcements data and sorted by firm trading symbol, by reported quarter and by event date. Every firm/quarter was defined by whether it had at least one qualifying VED between the two quarterly earnings announcements (the information cycle quarter). Every firm was then qualified based on the number of quarters, out of eight, in which it had issued at least one qualifying VED.

The 35 firms which issued VEDs in eight out of eight quarters, and the 41 firms which issued VEDs in seven out of eight quarters, were included in the target sample of 76 PD firms.

3.6 Matching method

Matched firm pairs of the same industry, similar size and number of covering analysts were used to select the control sample of ED firms. Although matching by industry group and size usually answers pertinent control issues, and is widely used in similar research, there is a spuriousness risk if PD VED is used by companies who also have a relatively high general disclosure and informativeness level. Corporate informativeness

Since this data was discontinued in 1996, and no suitable alternative has been found to control for disclosure level in a direct relation, it was controlled indirectly by the following two variables:

1. Firm size – Lang and Lundholm (1996) found an association between firm size and the disclosure score of the Association for Investment Management and Research (with whom FAF has merged).

2. The number of analysts following – Healy et al. (1999) found an association between disclosure ratings and the number of analysts following the firm.

Using these variables, short of being proxies for disclosure level, greatly reduces the risk of selecting matched pairs with completely different overall disclosure levels.

3.7 Selection of ED firms matching sample

The ED VED profile, as defined above, is a profile of a firm that provides VED but does not qualify as a PD VED profile. In line with this, the matching pool of 1487 ED firms was constituted by taking the 2101 firms which issued qualifying VEDs in fewer than half the quarters studied, and excluding the 614 firms which did not issue any VED during the period (see Table 1). With 58% of the entire population, this is the prevailing VED profile, supporting the interest in comparing the PD profile against it.

Table 1 Distribution of firms by the number of quarters with qualifying VEDs

<table>
<thead>
<tr>
<th>Number of quarters with qualifying VEDs (out of eight quarters)</th>
<th>Firms</th>
<th>%</th>
<th>Firms</th>
<th>%</th>
<th>Definition</th>
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<tbody>
<tr>
<td>8</td>
<td>35</td>
<td>1.4</td>
<td>76</td>
<td>3.0</td>
<td>Period-driven (PD)</td>
</tr>
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<td>7</td>
<td>41</td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td>82</td>
<td>3.2</td>
<td>389</td>
<td>15.2</td>
<td>VEDs at least in half the Qs</td>
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<td>4.2</td>
<td></td>
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<td>1487</td>
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<td>Event-driven (ED)</td>
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<td>23.9</td>
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<td>23.9</td>
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<td><strong>2566</strong></td>
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</tbody>
</table>

Note: *These 225 firms with 0 qualifying VEDs did issue bundled (non-qualifying) VEDs during the period, as opposed to the 614 non-VED firms below, which did not issue any VED.
Each PD firm was matched against all ED firms of the same industry, based on four, three or two digits of the industry SIC code. The matching ED firm was selected based on the smallest average absolute percentage deviation of market capitalisation and the number of covering analysts from the PD firm to be matched, with equal weights.

3.8 Control procedure

In spite of the matching procedure used, the PD sample is composed of larger firms having more analysts covering them, as compared with the resulting matched ED sample. To control for these two factors, a subsample of the original 76 matching pairs was constructed, using a procedure aimed at forcing the PD and ED samples to similar characteristics. The procedure consisted of selecting pairs in which the ED firm had a larger size and/or more covering analysts in descending difference order. This resulted in samples of 41 pairs (matching control samples) with statistically comparable size and analyst coverage. All tests performed using the complete sample of 76 firms were subsequently controlled (where relevant) by applying them to the matching control sample of 41 firms. In addition, stock returns and analyst accuracy tests were based mostly on scaled (relative) values, which neutralise and control for external variables, as described in Section 4.2.

4 Results

The 2566 qualifying firms, which had earnings announcements and analyst coverage throughout the period, issued in total 15298 VEDs during the two-year period under study. This includes 5364 VEDs bundled with official quarterly earnings releases, and 4246 VEDs combined with other VEDs (reported during the same disclosure event). These VEDs were reported by 1952 firms. The other 614 firms did not issue a single VED during the study period. On an annual basis this represents a mean of 2.98, and a median of two VEDs per firm, with a standard deviation of 3.35. For reporting firms only, the mean of VEDs per firm per year is 3.92, the median is three, and the standard deviation is 3.26. This is in line with the more recent research as described in Section 2.4 above.

Both PD and ED sample firms have wide and similar industry diversity. The population of 76 PD firms comes from 47 different industries, and the matching ED firms come from 52 different industries. The PD sample firm capitalisation ranges from 18 million to 372 billion dollars and is covered by between 1 and 31 analysts. In spite of the selection process for matching ED firms, the PD sample is larger and more widely covered than the ED matching sample. The ED matching sample, being ‘pulled up’ by the higher size of the PD sample, is larger than the overall ED population. The overall ED population is not significantly different from the entire population.

The matching control samples (2 × 41 firms) had comparable mean capital sizes of 5310–5337 million and 7.6–7.7 covering analysts.
4.1 Are period-driven and event-driven distinct firms’ VED strategies?

When a quarterly reporting cycle is closed, by means of the official public earnings release, PD VED does not provide more information than any other VED profile. At the time of issuing VED, the information provided is new, but this new information, which is a preliminary estimate, ‘pulls forward’ information content from the subsequent earnings announcement. Neither do PD VED firms necessarily provide better quality disclosure, which is not within the scope of this study. Therefore, if the PD VED profile can be distinct from ED VED profile, such a distinction must be based on controllable, time-related VED attributes. Time-related VED attributes, regularity, frequency, timeliness, the practice of issuing VEDs even when their content is essentially confirmatory, prescheduling and denomination of the VEDs are fully controllable by the firm. Therefore, significant differences in these attributes of PD VED as compared with ED VED will support their classification as distinct VED strategies. The following six hypotheses (stated in their directional form) are tested by comparing the PD and ED samples.

4.1.1 VED regularity

Exceptional events and their timing are not fully controllable by the firm, and neither are the dates of their disclosure, if the firm is to follow SEC rules. PD disclosure, which is independent of the underlying events, is fully controllable in terms of timing, enabling a higher regularity in disclosure.

A1H1: Period-driven VED firms have higher VED regularity than event-driven VED firms.

VED regularity is defined here at the firm level. From the market perspective, a regular VED firm will issue VED (at least one) every information quarter. It will do so independently of firm-specific events, interests, information gap, etc. This is probably the dominant quantitative aspect of a firm’s VED profile. All other VED aspects, tested in A2–A6 hypotheses below, are subject to and depend upon this attribute. For this reason it has been used as the defining and selection aspect of the VED profiles studied.
Table 3  Distribution of firms with qualifying VEDs in each of the eight quarters

<table>
<thead>
<tr>
<th>Quarters out of eight with VEDs</th>
<th>PD firms</th>
<th>ED firms</th>
<th>All firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>7</td>
<td>839</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>16</td>
<td>530</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>25</td>
<td>420</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>28</td>
<td>312</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>198</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>109</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
<td>82</td>
</tr>
<tr>
<td>7</td>
<td>41</td>
<td>0</td>
<td>41</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>76</td>
<td>76</td>
<td>2566</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>7.46</td>
<td>1.97</td>
<td>1.83</td>
</tr>
<tr>
<td>Median</td>
<td>7.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Std. dev.</td>
<td>0.50</td>
<td>0.97</td>
<td>1.92</td>
</tr>
</tbody>
</table>

The regularity hypothesis A1H1 is therefore confirmed by definition and selection.

4.1.2 VED frequency

ED VED firms will disclose VEDs in reaction to events. PD VED firms will, in addition, also issue VEDs at certain time thresholds.

A2H1: Period-driven VED firms have higher VED frequency than event-driven VED firms.

Comparing the frequency of VEDs between PD and ED firms is essentially confirmatory since it derives from the samples’ respective definitions and selection. This test is nevertheless warranted for the following reasons: The samples’ definition and selection are based on the number of quarters with VEDs, which is different from the overall VED frequency during the entire test period; they are based on the number of quarters with qualifying VEDs.

PD firms show a much higher frequency of qualifying VEDs, and a slightly higher frequency of bundled VEDs compared with ED firms. Using significance t-tests, PD and ED means are different, with t(150) = –18.61 for qualifying VEDs; –2.91 for bundled VEDs; –15.84 for all VED events, $p < 0.01$.

Controlling for size and the number of covering analysts by matching control samples of 41 firms (see Section 3.8 above) confirms the results of Table 4 in both values and significance.
Table 4 VED frequency distribution

<table>
<thead>
<tr>
<th>VED type</th>
<th>Statistic</th>
<th>PD firms</th>
<th>ED firms</th>
<th>ALL 2566 firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-year period</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifying</td>
<td>Mean</td>
<td>10.80</td>
<td>2.16</td>
<td>2.22</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>10.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Std. dev.</td>
<td>3.36</td>
<td>1.21</td>
<td>2.65</td>
</tr>
<tr>
<td>Bundled</td>
<td>Mean</td>
<td>4.46</td>
<td>3.22</td>
<td>2.09</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>5.00</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. dev.</td>
<td>2.59</td>
<td>2.63</td>
<td></td>
</tr>
<tr>
<td>All events</td>
<td>Mean</td>
<td>15.26</td>
<td>5.38</td>
<td>4.31</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>16.00</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Std. dev.</td>
<td>4.39</td>
<td>3.06</td>
<td></td>
</tr>
<tr>
<td>Annualised</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualifying</td>
<td>Mean</td>
<td>5.40</td>
<td>1.08</td>
<td>1.11</td>
</tr>
<tr>
<td>Bundled</td>
<td>Mean</td>
<td>2.23</td>
<td>1.61</td>
<td>1.04</td>
</tr>
<tr>
<td>All events</td>
<td>Mean</td>
<td>7.63</td>
<td>2.69</td>
<td>2.15</td>
</tr>
</tbody>
</table>

Note: VEDs combined with others are not counted separately.

Qualifying VEDs represent mostly ED VEDs for all firms plus PD VEDs for PD firms. PD VEDs do not seem to reduce events occurrences or to replace ED VEDs, but to come in addition. Bundled VEDs, issued together with the quarterly earnings announcements, represent mostly guidance. The relative similarity in the frequency of bundled VEDs suggests that PD firms do not have a different approach to guidance as compared with ED firms. Bundled VEDs have no information content and do not reduce information gap (Feldman et al., 2003). They essentially communicate to the market what management forecasts and targets. In contrast, qualifying VEDs have information content. They reduce information gap (as will be found later) and update the market with what management knows from the elapsed period.

4.1.3 VED timeliness

The timeliness of disclosure by PD VED firms is a trade-off between providing early estimates to the market, and having a meaningful signal, based on a long enough period, following the previous earnings announcement. ED VED firms, in contrast, do not have the first objective, so their disclosure is likely to happen later during the relevant period, often towards or after its end.

A3H1: Period-driven VED firms have earlier VED timeliness than event-driven VED firms.

VED timeliness is based on the timing of the first qualifying VED during the ‘information cycle’ quarter. This VED may be published either prior to, or after, the quarter-end but before official earnings release day (pre-announcements). This distinction provides the first measure of a firm’s VED timeliness. In addition, timing will be measured in terms of the day number on which the first VED is published in relation to the end of the current calendar quarter, defined as day 0.
Table 5  VED timeliness, based on the first qualifying VED in the quarter

<table>
<thead>
<tr>
<th>First VED in quarter</th>
<th>PD</th>
<th>Percentage (%)</th>
<th>ED</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>During quarter</td>
<td>457</td>
<td>80.6</td>
<td>87</td>
<td>58.0</td>
</tr>
<tr>
<td>After quarter-end</td>
<td>110</td>
<td>19.4</td>
<td>63</td>
<td>42.0</td>
</tr>
<tr>
<td>(Pre-announcement)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All first VEDs</td>
<td>567</td>
<td>100.0</td>
<td>150</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Days post (pre) quarter-end date</th>
<th>Average</th>
<th>Median</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD</td>
<td>–21.20</td>
<td>–19.00</td>
<td>22.61</td>
</tr>
<tr>
<td>ED</td>
<td>–8.75</td>
<td>–4.00</td>
<td>22.58</td>
</tr>
</tbody>
</table>

PD firms provide 80.6% of their first qualifying VEDs during the calendar quarter, compared with only 58% for ED firms. The average number of days before quarter-end for making the first VED in the quarter is earlier for PD firms: 21.2 days against 8.75 days. These results are statistically significant with t-test $t(715) = 5.99, p < 0.01$. The typical PD firm, based on the median, posts its first VED 19 days pre-quarter-end against four days only for the typical ED firm. These results are confirmed when controlled for size using the matching control samples. This supports hypothesis A3H1.

As shown in Figure 1, large increases in the number of First VEDs for PD firms occur from day –56 and then, even more significantly, from day –27. These correspond to the days immediately following the first and the second months of the quarter respectively, when internally reported results become available to management. The period of –27 to –9 is the busiest period corresponding with the earliest possible timing prior to official earnings announcement, with good visibility over expected quarterly earnings, as two months’ results are known and the third month is in progress and estimates are becoming available.

Figure 1  Cumulative percentage distribution of the day of the first VED per firm/quarter
Another active period is observed from day 1 after the close of the quarter, accelerating towards day 11, in line with the timing of early results of the third and final month. ED firms, in contrast, do not present significant timing patterns, showing a gradual acceleration of the first VED reporting throughout the period all the way to day 11. PD firms are clearly making an extra effort to diffuse data as soon as it becomes available.

### 4.1.4 Confirming VEDs

The information content of a VED, which is a function of current and estimated results, as well as the market expectations of these results, is not fully controllable by the firm at any given date. However, the decision whether or not to issue a confirmatory VED, i.e., in line with market expectations on the VED date, is fully controllable by the firm. The PD VED profile is likely to result in a higher proportion of VEDs of confirmatory nature. In contrast, the ED VED profile will have fewer, if any, confirming VEDs, since they do not consider confirmatory results an event. ED firms, on the contrary, will have a higher proportion of their VEDs being a surprise for the market.

**A4H1:** Period-driven VED firms will have a higher proportion of confirming VEDs, while event-driven VED firms will have a higher proportion of surprising VEDs.

The First-Call database compares VEDs against consensus estimates and qualifies them in the ‘CIG Description Code’ as negative, positive or no surprise. Based on qualifying (unbundled) VEDs, the proportions of surprise and no-surprise VEDs have been compared.

#### Table 6 Distribution of surprise/no-surprise qualifying VEDs

<table>
<thead>
<tr>
<th>VED description (Based on First-Call code)</th>
<th>PD Percentage (%)</th>
<th>ED Percentage (%)</th>
<th>Difference PD-ED</th>
<th>Ratio PD/ED</th>
</tr>
</thead>
<tbody>
<tr>
<td>No surprise</td>
<td>479 63.6</td>
<td>55 37.7</td>
<td>424</td>
<td>8.7</td>
</tr>
<tr>
<td>Positive surprise</td>
<td>111 14.7</td>
<td>27 18.5</td>
<td>84</td>
<td>4.1</td>
</tr>
<tr>
<td>Negative surprise</td>
<td>163 21.6</td>
<td>64 43.8</td>
<td>99</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>753 100.0</strong></td>
<td><strong>146 100.0</strong></td>
<td><strong>607 5.2</strong></td>
<td></td>
</tr>
</tbody>
</table>

PD firms clearly have a higher proportion of no-surprise VEDs: 63.6% against 37.7% for ED firms. In contrast, ED firms have a higher proportion of surprises, 62.3%, and mostly negative ones, 43.8%, compared with PD firms with 36.4% surprises and only 21.6% negative ones. The reported dependence is significant with Chi-square $\chi^2 (2, N = 899) = 38.82, p < 0.01$. It is also evident, from the difference and the ratio of VEDs issued by the two groups, that the significantly higher VED activity of the PD group is concentrated in the confirming VEDs (with no surprises). These VEDs are period-driven, rooted in a PD VED strategy. Results of the matching control samples’ tests confirm the above, independently of firm size and analyst covering.

This supports hypothesis A4H1.
4.1.5 VED prescheduling

Exceptional events and their timing are not known in advance and therefore the dates of their disclosure cannot be prescheduled by ED VED firms. These are more likely to be ad hoc unannounced VEDs, often surprising the market in terms of their timing (and content, as analysed in Section 4.1.4). In contrast, periodic disclosure and its timing are fully controllable and known in advance. These are likely to be regular, scheduled and planned, enabling their prescheduling by PD VED firms.

A5H1: Period-driven VED firms have a higher proportion of prescheduled VEDs than event-driven VED firms.

Scheduling is found by Ederington and Lee (1996) to make a difference in the implied volatility. A prescheduled disclosure creates volatility prior to and during the event, which abates later. An unscheduled surprise, however, does not generate pre-event volatility, as its occurrence is unknown in advance, but leads to greater volatility during and following the event, lasting much longer as the underlying asset is perceived to be more risky.

Using the Factiva (Dow Jones Reuters Business Interactive LLC) database, several keyword searches have been performed, screening and comparing all the news items of the firms constituting the PD and the ED sample firms. Several combinations of keywords implying prescheduling were tested, in different aggregates and structures. None have enabled finding reliable and complete information about the prescheduling of VEDs. This is largely explained, for the relevant study period, by the following: Prescheduling of VEDs are not considered news and thus are not reported by the news services; they are often published on firm’s internet sites, which are not systematically monitored by news services.

Ample anecdotal examples of VED prescheduling can be found on PD firms’ sites:

“……announces Posting of Mid-Quarter Update”
“……announces Date of Next Interim Sales Update and Earnings Guidance”
“Reminder: …… Corp. Invites You to Its Mid-Quarter Investor Update Conference Call”
“September 17: …… will issue a third quarter 2002 interim update press release”

While the above, and more evidence, lend credibility to the prevalence of prescheduling of PD VED events, it is not sufficient to formally support hypothesis A5H1.

4.1.6 VED denomination

The denomination and classification of a VED announcement by the firm, and/or by the reporting media, often reflect the nature of the VED and the underlying driver of the firm issuing it.
A6H1: Period-driven VED firms will have a higher proportion of VEDs with time-related
denomination, while event-driven firms will have a higher proportion of VEDs with
event-related denomination.

PD VEDs are recognised by names that include specific time-related words such
as mid-Q, midquarter, intraquarter or other similar derivatives. Scanning the Factiva
database, 15 firms from the PD sample had these names for their VEDs during the study
period, compared with three for the ED sample (of which two are clearly stated
as exceptional events). VED denomination, including the words ‘quarter-update’ or
‘quarterly update’, also reflects a PD event, but without specified timing. These were
present in four PD firms (different from the 15 mentioned above), compared with only
one ED firm. In contrast, names like preliminary results, pre-announcement and the likes
appeared in relation to 15 ED firms and only five PD firms. These VEDs, which are
issued after quarter-end, are often (but not always) associated with *ad hoc* surprise VEDs,
more typical of ED than PD VED strategy. The reported dependence is significant with
Chi square $\chi^2 (2, N = 43) = 14.41, p < 0.01$.

This supports hypothesis A6H1.

The combination of the above six controllable VED attributes clearly evidences the
existence of a comprehensive driving strategy behind them. It is termed ‘period-driven
VED strategy’.

4.2 Does period-driven VED improve the information environment over
event-driven VED?

In order to test whether the PD VED strategy improves a firm’s information environment,
its consequences will be assessed as reflected by stock returns and by analysts’ forecasts.
Stock prices and returns are the ultimate test of information flow to the market, and
analysts' forecasts reflect earnings guidance firms are able to provide them (Heflin et al.,
2001). To try and provide an answer to this question, the following hypotheses will be
tested (stated in their directional form):

B1H1: Period-driven VED strategy is likely to reduce the information gap, as defined
below, relative to event-driven VED firms, during the period leading to the formal
quarterly earnings announcement.

The method followed is based on Heflin et al. (2003).
Earnings announcement date +2 trading days is the day on which full earnings information is reflected in the stock price. It is defined as the last day of the quarterly information cycle. Since full management information has been provided to the market, and absorbed in the stock price, it is defined as having zero information gap. Its ending cumulative abnormal return is defined as 0. At any prior point in time during the information cycle, the cumulative abnormal stock return, from that point to the end of the information cycle, reflects the flow of information which has yet to reach the market—the information gap.

Daily abnormal returns and cumulative daily abnormal returns were calculated in reverse from day +2 to day –T (day –T is the first day of the specific firm/quarter information cycle).

For every sample 1(PD) and 2(ED), firm i = 1 to n, quarter q = 1 to 8,

For every day t = –T to +2,

\[ r_{iqt} = \text{the abnormal daily return} \]

\[ R_{iqt} = \prod_{s=t}^{+2} (1 + r_{iqs}) - 1 = \text{absolute cumulative abnormal return (ACAR).} \]

Absolute cumulative abnormal returns (ACAR) for every day t were standardised by dividing them by ACAR value on day –T.

\[ R'_{iqt} = \frac{R_{iqt}}{R_{iq-T}} = \text{standardised ACAR.} \]

This resulted in values ranging from 1 on day –T to 0 on day +2. The value of 1 on day –T represents the full relative information content which has yet to reach the market, i.e., the full relative information gap.

For each sample and every day in the information cycle, the mean standardised ACAR of all firm-quarters in the sample were calculated.

For every day t = –T to +2

\[ \overline{R}'_{it} = \frac{1}{n\times8} \sum_{i=1}^{n} \sum_{q=1}^{8} R'_{iqt}. \]

The mean standardised ACARs, representing the information gap chart, were plotted by day and compared for the two samples.

An information gap chart for PD sample lower than the ED sample chart during the later part of the cycle (following the mean day of the first period-driven VED), will support B1H1.

For certain days t > mean first VED day of PD sample \( \overline{R}'_{t,PD} < \overline{R}'_{t,ED} \).

Two interdependent but complementary measures were tested:

1 the price discovery (information surprise) during the earnings announcement window (Table 7)
the information gap level and improvement during the entire quarterly information cycle (Figures 2–4).

Three measurement methods were used to compare each of the above two measures:
1. based on the Absolute (unscaled) Cumulative Abnormal Return (ACAR)
2. based on ACAR scaled generally by the sample’s average ACAR on day –64 of the information cycle
3. based on ACAR scaled specifically for each firm/quarter by its own ACAR on the first trading day of the information cycle.

Beyond the difference in method, there is a significant implication in the difference between the absolute returns, measuring the absolute information content, and the scaled returns, measuring the information content relative to the total information provided during the information cycle, by all sample firms (in 2 above), or by the specific firm (in 3 above). The ‘specifically scaled’ method in fact eliminates most of the size and analyst coverage effects, as each firm’s information gap is scaled by its own full starting information gap.

All earnings announcements windows in Table 7 show a lower price discovery for PD compared with ED firms, in all three methods. A higher price surprise, reflecting higher information content, is evidenced in earnings announcements of ED firms both in absolute and in relative terms. This is consistent with the assertion that PD firms had higher absolute and relative informativeness levels before the official earnings announcement.

Table 7

<table>
<thead>
<tr>
<th>Window definition</th>
<th>Method</th>
<th>Unscaled ACAR percentage (%)</th>
<th>ACAR as proportion of 1</th>
<th>Scaled generally by day –64</th>
<th>ACAR as proportion of 1</th>
<th>Scaled specifically</th>
<th>ACAR as proportion of 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post earnings-days 1 and 2</td>
<td>PD: 3.79</td>
<td>0.1992</td>
<td>0.3264</td>
<td>0.4023</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ED: 5.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From day –1 (3 days)</td>
<td>PD: 5.38</td>
<td>0.2824</td>
<td>0.4235</td>
<td>0.4751</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ED: 7.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>From day –2 (4 days)</td>
<td>PD: 5.82</td>
<td>0.3060</td>
<td>0.4483</td>
<td>0.4933</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ED: 7.74</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

All the PD-ED differences in Table 7 are significant using a t-test with t(1214) = –2.68 to –14.64, p < = 0.01.

The absolute information gap, as shown in Figure 2, is similar for PD and ED firms during the first part of the information cycle. The PD gap shows a gradual but consistent improvement compared with ED starting around day –30 of the information cycle, which corresponds with the mean and median days of the first VED of the PD group (Calendar days –21 and –19 respectively; see 4.1.3). The PD-ED differences in Figure 2 are significant using t-test with t(1214) < = –1.96, p < 0.05 from day –9 to day –1.
Figure 2  Information gap comparison – unscaled ACAR

Figure 3, ACAR scaled on day –64, shows a constant and increasingly lower information gap level for PD firms. The PD-ED differences on Figure 3 are significant using a t-test with $t(1214) \leq -1.96$, $p < 0.05$ from day –20 to day 0. The ‘generally scaled’ method is very sensitive to the scaling day. Analysis was also done using as scalings day –61, –62, –63 and –65. It does not reject the conclusions based on the above day –64 analysis.

Figure 3  Information gap comparison – ACAR scaled generally by day –64
The specifically scaled ACAR, Figure 4, which shows at any given day the proportion of the information gap relative to the full information of the specific firm/quarter, does not show PD providing more information during a major part of the period. Yet, as the VEDs provided by them accumulate, their information gap narrows and is lower than ED firms from day –17, with a more decisive and growing difference from day –13 onwards. The PD-ED differences on Figure 4 are significant using a t-test with $t(1214) < = -1.96$, $p < 0.05$ from day –7 to day 0.

To control for firm size and the number of analysts covering, the above six tests were performed with the matching control samples. Results of the Absolute tests confirm the lower price discovery for PD during earnings announcements windows, and the lower informativeness level during the later part of the quarter. They support and confirm the original findings, and their statistical significance, in these size-matched samples. The scaled tests, and in particular the specifically scaled tests comparing relative informativeness at earnings announcement windows and during the quarter, also confirm both the values and significance of the original results.

In conclusion, the above tests support hypothesis B1H1 that PD VED strategy is likely to lower the information gap relative to ED firms, during the period leading to the formal quarterly earnings announcement. PD firms gradually develop a smaller information gap during the information cycle, and thus have a lower price discovery during the earnings announcement window. Size and analysts coverage may influence absolute information gap, consistent with prior research, but the comparison of relative information gap, which neutralises the size effect, and the matching control tests validate the results beyond the size effect.
4.2.2 Does period-driven VED reduce analysts’ forecast error and dispersion?

Financial analysts base their forecasts largely on company information. PD VED may provide them systematically with earlier and better estimates to base their forecasts on. Their revised forecasts following PD VEDs are likely to reflect this information, thus becoming more accurate and show lower dispersion.

**B2H1:** Period-driven VED is likely to improve analysts’ forecast accuracy and reduce its dispersion, relative to event-driven VED firms, during the period leading to the formal quarterly earnings announcement.

**B2.1H1:** Period-driven VED is likely to reduce analysts’ forecast error.

**B2.2H1:** Period-driven VED is likely to reduce analysts’ forecast dispersion.

The following data was listed and calculated for every firm-quarter: for every forecast day $t$, Earnings Per Share (EPS) forecast mean, median and standard deviation; forecast error using median as the consensus forecast; for every firm $i$ and quarter $q$, EPS actual.

For every day $t$, firm $i$, quarter $q$:
- A forecast by analyst $a$: $e_{iqa}$.
- Mean consensus forecast of all $m$ analysts:
  $$\bar{e}_{iq} = \frac{1}{m} \sum_{a=1}^{m} e_{iqa}.$$
- Median consensus forecast of all $m$ analysts:
  $$\tilde{e}_{iq}.$$
- For every firm $i$, quarter $q$, EPS actual: $E_{iq}$.
- Absolute consensus forecast error for day $t$, based on median forecast:
  $$C_{iq} = |\tilde{e}_{iq} - E_{iq}|.$$

Consensus forecast error was scaled by the firm share price at the beginning of the respective year, to reflect forecast error in comparable yield terms.

For every firm $i$, in quarter $q$, share price: $P_{iq}$.

Scaled consensus forecast error for day $t$:
$$C'_{iq} = \frac{C_{iq}}{P_{iq}}.$$

A forecast is not only used and relevant on the day it is issued or revised, but also during the subsequent days, until it is superseded by a revised forecast. Analysts forecast accuracy at a given day is therefore reflected by all outstanding forecasts. In line with this, every day $t$ for firm $i$ and quarter $q$ (if $t$ is not a forecast day) was assigned the forecast error and dispersion values of the latest preceding forecast day.

The mean scaled consensus forecast error for a day $t$ across all $n$ firms and eight quarters, for each sample PD and ED was calculated:
$$\bar{C}'_t = \frac{1}{n \times 8} \sum_{i=1}^{n} \sum_{q=1}^{8} C'_{iq}.$$
These were plotted and compared for the two samples. A mean scaled consensus forecast error chart for PD sample lower than the ED sample chart during the later part of the cycle (following the mean day of the first period-driven VED) will support B2.1H1.

For certain days \( t > \) mean first VED day of PD sample \( \bar{C}_{t,PD} < \bar{C}_{t,ED} \).

The same method was used to compare forecast dispersion (standard deviation of the forecast).

Standard deviation of \( m \) analysts’ forecasts:

\[
\sigma_{\hat{e}_{t_{iq}}} = \sqrt{\frac{1}{m-1} \sum_{a=1}^{m} (\hat{e}_{t_{aq}} - \bar{e}_{t_{iq}})^2}.
\]

This was scaled by the firm share price at the beginning of the respective year, to reflect it in comparable yield terms.

\[
\sigma_{e_{t_{iq}}} = \frac{\sigma_{\hat{e}_{t_{iq}}}}{P_{t_{iq}}}.
\]

The mean scaled standard deviation for a day \( t \) across all \( n \) firms and eight quarters, for each sample PD and ED was calculated:

\[
\sigma'_{e_{t_{iq}}} = \frac{1}{n \times 8} \sum_{i=1}^{n} \sum_{q=1}^{8} \sigma_{e_{t_{iq}}}.
\]

These were plotted and compared for the two samples. A mean scaled standard deviation chart for PD sample lower than the ED sample chart during the later part of the cycle (following the mean day of the first period-driven VED) will support B2.2H1.

For certain days \( t > \) mean first VED day of PD sample \( \sigma_{e_{t_{PD}}} < \sigma_{e_{t_{ED}}} \).

Three different tests were performed as described below:

- The first test compared, in line with prior research, the latest forecast error and dispersion prior to each firm/quarter earnings announcement. Consensus forecast is based on median forecast, and forecast error is scaled by the share price at the beginning of the year of the earnings announcement date (this also ensures that all the data related to an information cycle period is scaled by the same value). Two measurement methods were used: non-standardised data – reflecting the absolute informativeness level; standardised data scaled by its level for the same firm/quarter at the start of the quarter – reflecting relative informativeness level.

<table>
<thead>
<tr>
<th>Table 8</th>
<th>Latest pre-earnings analysts forecast error and dispersion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unscaled × 1000</td>
</tr>
<tr>
<td>Statistic</td>
<td>PD</td>
</tr>
<tr>
<td>Average</td>
<td>1.502</td>
</tr>
<tr>
<td>Median</td>
<td>0.396</td>
</tr>
<tr>
<td>Ratio</td>
<td>186%</td>
</tr>
<tr>
<td>ED/PD</td>
<td>190%</td>
</tr>
</tbody>
</table>
The latest pre-earnings-announcement forecast error and dispersion for PD firms are lower than for ED firms in all tests. Results based on the average are significant with $t(1214) = -3.26$ to $-5.26$, $p < 0.01$. Results based on the median are significant using the Westenberg-Mood median test with Chi-square $\chi^2 (1, N = 1181) = 21.41$ to $46.76$, $p < 0.01$.

Firms aim VEDs, among others, at guiding analysts’ forecasts in a way such that earnings released will not miss the consensus forecast, and earnings surprises will be prevented. The second test compares the number of occurrences of actual reported earnings missing, meeting or beating consensus forecast. It is based on comparing the actual earnings per share announced with the latest median and average consensus forecast for the firm/quarter, and counting the number of firm/quarter events of missing (actual results below forecast), meeting, or beating (actual results above forecast) the forecast.

**Table 9** Actual EPS compared with consensus forecast

<table>
<thead>
<tr>
<th></th>
<th>PD Average</th>
<th>PD Median</th>
<th>ED Average</th>
<th>ED Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miss</td>
<td>58</td>
<td>53</td>
<td>101</td>
<td>96</td>
</tr>
<tr>
<td>Meet</td>
<td>172</td>
<td>178</td>
<td>137</td>
<td>138</td>
</tr>
<tr>
<td>Beat</td>
<td>368</td>
<td>367</td>
<td>345</td>
<td>349</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of total (%)</th>
<th>PD</th>
<th>ED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miss</td>
<td>9.7</td>
<td>8.9</td>
</tr>
<tr>
<td>Meet</td>
<td>28.8</td>
<td>29.8</td>
</tr>
<tr>
<td>Beat</td>
<td>61.5</td>
<td>61.4</td>
</tr>
</tbody>
</table>

PD firms reduce almost by half the events of missing the consensus forecast, from about 17% to 9%. They show more events of exactly meeting the consensus, 29% against 24%, while beating the forecast, the prevalent occurrence, is about the same, 60% of the events, for both. Results are significant with Chi-square $\chi^2 (2, N = 1181) = 16.15$ to $17.78$, $p < 0.01$.

In the third test, analyst forecast error and dispersion, in addition to their latest pre-earnings level, were also compared based on all available consensus forecasts recorded/revised during the entire information cycle. Error and dispersion at any forecast date represent the information gap at that point in time, relative to the subsequently reported actual EPS. As described above, both non-standardised data – reflecting the absolute informativeness level, and standardised data were tested. The trend of forecast error and dispersion standardised by their level at the first forecast during the information cycle reflects the improvement of error and dispersion during a firm/quarter information cycle relative to its own situation at the start of the cycle. This analysis neutralises the absolute level of informativeness, and the influence of size and analyst coverage upon it. Forecast error (based on median forecast) and forecast dispersion of the first forecast of
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the cycle were standardised to 1. All subsequent values for the cycle were divided by the first value, resulting in relative values. Values higher than 1 were suppressed to 1, but the results of the test are robust without such suppression.

The unscaled tests (charts not displayed) show lower forecast error and dispersion for PD firms, not only for pre-earnings, as shown above, but during the whole information cycle. However, there is no difference in the rate of improvement between the two samples, and the respective slope differences are not significant.

The standardised tests (Figures 5 and 6) clearly show a stronger informativeness improvement during the information cycle for PD firms. This is reflected by both forecast error and dispersion showing a higher reduction rate and ending the period at a significantly lower level. PD firms reduce their relative forecast error during the quarter by 50%, while ED firms reduce it by only 30%. The forecast dispersion, a proxy for earnings uncertainty (Clement et al., 2000), is reduced by 50% for PD firms, and by only 35% for ED firms.

Testing the difference between the slopes, with a regression using T for day number and D as indicator variable D = 0 for PD and D = 1 for ED, confirms the slope difference of 0.0019 (t = 18.28; p < 0.01), for forecast error, r² = 0.95, F = 1294, p < 0.01.

Relative forecast error = 0.9652 – 0.0039*T – 0.0381*D + 0.0019(D*T).

It also confirms the slope difference for forecast dispersion of –0.0009 (t = 6.13; p < 0.01), r² = 0.90, F = 677, p < 0.01.

Relative forecast dispersion = 0.9040 – 0.0035*T – 0.0261*D + 0.0009(D*T).

Coefficients in the above regressions are statistically significant with p < 0.01.

Figure 5  Forecast error trend relative to its initial level (standardised)

![Forecast error trend relative to its initial level](image-url)
To control for firm size and the number of analysts covering, the above tests were performed with the matching control samples.

Looking at the latest pre-earnings forecast error and dispersion, the unscaled test confirms the lower forecast error and the lower dispersion for PD firms. This is in line with similar results in the initial test. The scaled test performed on the matching control samples also confirms the results of Table 8 in terms of values and significance.

The analysis of missing, meeting or beating the consensus forecast is also confirmed by the tests performed on the matching control samples. PD firms miss fewer and meet or beat more forecasts than ED firms.

Control tests during the entire information cycle do not confirm a significant lower PD forecast error and dispersion on an absolute level. This is in line with the original test. They show that relative forecast error and dispersion are consistently lower for PD than for ED firms, as shown by the original results.

In conclusion, the above tests support hypotheses B2H1 that the PD VED strategy is likely to improve analysts’ forecasts by lowering their relative forecast error and dispersion compared with ED firms, during the period leading to the formal quarterly earnings announcement, and by lowering their absolute and relative forecast error and dispersion at the last pre-earnings forecast. They also confirm that PD reduces negative earnings surprises at earnings announcement dates. Size and other factors may have an impact on the absolute level of forecast error and dispersion but standardised tests, which mostly neutralise size effect, and the matching control tests clearly demonstrate the PD impact.
5 Conclusions

The PD VED is characterised by the regularity, frequency and timeliness of its VEDs, by issuing VEDs even when merely confirming, by prescheduling VEDs (anecdotal evidence), and by using period-driven denominations. These planned and controllable activities evidence a comprehensive VED strategy, in contrast with the prevailing event-driven approach of issuing VEDs when warranted by material events and/or when serving firm or management *ad hoc* interests. The PD VED strategy improves the information environment for firms applying it through smaller information gap, lower analysts’ forecast error and dispersion, and fewer surprises at earnings release dates. While size and analyst coverage may influence firm’s *absolute* informativeness level, along with other qualitative and quantitative factors, PD VED has a clear and significant impact. It reduces the absolute information gap for firms applying it, and improves their *relative* informativeness level during the quarterly information cycle and towards earnings release dates. The PD VED strategy is more prevalent among large firms followed by more analysts, which already have higher market informativeness. Further research may examine whether PD has a stronger impact for smaller firms followed by fewer analysts. For these firms, company-sourced VED may compensate for other information sources.

Firm-sourced information is by far the main public source of performance and value indication. Its information content is evidenced as a major market mover. Recent developments contribute to heighten the importance of VED and its frequency, regularity and timeliness: The internet enables real-time, faster, public information disclosure at significantly lower cost; FD regulation, enacted in October 2000, prohibits selective disclosure; other SEC initiatives and directions go further towards higher transparency and real-time information. Overall, as suggested by Lev (1992), “Managers have an implicit responsibility to investors to continually maintain market values as close as feasible to intrinsic ones” through an “*even flow* of credible information, as opposed to infrequent releases of highly surprising news”. This is achieved by PD VED. Since an improved information environment in a firm’s stock market leads to a lower cost of capital, as evidenced by prior research, the PD VED strategy may be an interesting proposition in efforts to enhance shareholder value. The recent public debate over the practice of earnings guidance, and suggestions to scale it down, should motivate further research into the differences between earnings guidance and earnings updates and market reactions to them in the short and long term.

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