Title	Measuring the effectiveness of Australia's Statutory-backed continuous disclosure policy on 'innovative' investment disclosures
Authors(s)	Harford, Jarrad, Powell, Ronan
Publication date	2015-01
Publication information	Harford, Jarrad, and Ronan Powell. Measuring the Effectiveness of Australia's Statutory-Backed Continuous Disclosure Policy on "Innovative" Investment Disclosures. Centre for International Finance and Regulation, January, 2015.
Series	Centre for International Finance and Regulation Research Working Paper, 051/2015
Publisher	Centre for International Finance and Regulation
Item record/more information	http://hdl.handle.net/10197/7513

Research Working Paper Series

Measuring the effectiveness of Australia's Statutory-backed continuous policy on 'innovative' investment disclosures

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JANUARY 2015
WORKING PAPER NO. 051/2015 / PROJECT NO. E210

This research was supported by the Centre for International Finance and Regulation, which is funded by the Commonwealth and NSW Governments and supported by other Consortium members

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Measuring the effectiveness of Australia's statutory-backed continuous disclosure policy on 'innovative' investment disclosures*

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Abstract
We examine the impact of the introduction in 1994 (and subsequent amendments) of the statutory-backed continuous disclosure policy (SBCDP) in Australia. Our analysis measures impact by focusing on the investment disclosure propensity, and investment announcement abnormal returns of more innovative investments, defined as disclosures of R&D and IT expenditures. We also examine CAPEX investment disclosures as a benchmark in which to compare R&D and IT disclosures. Using regression models to control for typical characteristics (i.e., firm, industry, macroeconomic and time) that are correlated with investment likelihood, we find that post SBCDP adoption in 1994, firms were *less* likely to disclose any investment type. We do, however, find a significant increase in disclosure likelihood after the adoption in 2003 of stronger non-disclosure legislation, and tougher penalties. Nevertheless, compared to CAPEX disclosures, firms are still less likely to disclose R&D investments, even after the adoption of tougher penalties in 2003. We interpret this finding as evidence of firms unwilling to forego competitive advantages, which likely arise with R&D investments. We also find some evidence of increased announcement returns post SBCDP adoption, but only for CAPEX investments. The abnormal returns to R&D investments appear to be uncorrelated with changes in regulation, and remain fairly constant over the sample period.

JEL Classification: G31; G32; O32

Key words: Continuous disclosure; Regulation change; Innovation; R&D; IT; Abnormal returns

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We appreciate valuable comments and suggestions from two CIFR anonymous referees.

1. Introduction

The disclosure of timely and accurate company information is a fundamental component of firm valuation and stock market efficiency. Disclosures help reduce information asymmetry (e.g., Diamond and Verrecchia, 1991; Healy and Palepu, 2001) arising from investors not having access to the same information as managers about the firm's future growth prospects, which is a key component in predicting future firm value. Greater disclosure is also related to proxies for more efficient stock prices, including lower bid-ask spreads and higher liquidity (e.g., Glosten and Milgrom, 1985; Amihud and Mendelson, 1986; Diamond and Verrecchia, 1991; Leuz and Verrecchia, 2000). Prior studies have examined disclosures related to earnings announcements, including voluntary management earnings forecasts (Lev and Penman, 1990; Skinner, 1994), and show that investors appear to value these disclosures as evident by revisions in analyst forecasts (e.g., Baginski and Hassell, 1990; Cotter, Tuna, Wysocki and Callen, 2006; Ota, 2009), and significant announcement returns when forecasts are disclosed (e.g., Foster, 1973; Baginksi and Hassell, 1990; Lev, 1992; Hutton and Stocken, 2009).

Given the importance of financial disclosures, in particular timeliness, Australia introduced a statutory-backed continuous disclosure policy (hereafter, SBCDP) in September 1994. The motivation for its introduction can be traced to the large number of corporate scandals related to low quality disclosures, non-disclosures and unexpected corporate failures in the mid to late 1980s (e.g., see Brown, Taylor and Walter, 1999). At that time, a SBCDP was seen as a better alternative to a more regular reporting interval, such as quarterly reporting used in many other countries, including the US and Canada (Gallery, Guo and Nelson, 2010).

Prior research provides mixed conclusions on the effectiveness of Australia's SBCDP policy. For example, Gallery et al. (2010) fail to find any evidence that the introduction of a SBCDP improved timeliness, and show that bad news events tend to be disclosed later than good news events since the introduction of the SBCDP in 1994. Their findings support the view that increased litigation risk and penalties, arising possibly from increased disclosure, encourage managers to take a more conservative stance on what to disclose, and timing. Guo (2011), on the other hand, reports some evidence of increased frequency and quality of disclosures since the introduction of the SBCDP in 1994, but also finds evidence of increased non-disclosure for bad news earnings events. Similar evidence is reported for other countries that have adopted a SBCDP. For example, Dunstan, Gallery and Truong (2008) show that while the introduction of a SBCDP in New Zealand in 2002 led to an increase in the frequency and quality (i.e., precision and accuracy) of voluntary management earnings forecasts, forecast timeliness has declined.

This paper examines whether the introduction of a SBCDP in Australia had a marked effect on the disclosure of '(stock) price-sensitive' innovative investment expenditures. We broadly define 'innovative' expenditures as disclosures of R&D and IT investments. We focus our analysis on these firm-investments primarily because of their more strategic nature, they are likely to be more important than traditional capital expenditures (CAPEX) in promoting competitive advantage, and so disclosure of these investments may cause greater managerial conflict, especially post SBCDP adoption. Specifically, pre-SBCDP adoption, firms are less likely to disclose highly valued R&D (and possibly IT) expenditures, since disclosure would incur larger costs related to loss of competitive advantage through rivals learning proprietary project information resulting in knowledge spillovers (e.g., Schumpeter, 1934; Jaffe, 1986; Griliches, 1992).[1] Since the costs of non-disclosure (i.e., penalties) in a non-statutory backed environment are lower than the benefits of non-disclosure (i.e., competitive advantage), managers are less likely to disclosure these investments, or at least are less transparent if they do.

In non-SBCDP environments, such as the US, it is common for firms not to disclose highly valued innovative investments for fear of losing competitive advantage. For example, Aboody and Lev (2000) show that even major R&D events (e.g., success in clinical tests) are not routinely disclosed to US stock markets. More recently, Kob and Reeb (2014) show that over 42% of US listed firms do not

[1] Prior studies have reported significant positive announcement abnormal returns for R&D and IT expenditure announcing firms (e.g., McConnell and Muscarella, 1985; Woolridge, 1988; Vogt, 1997) and significant negative returns for rivals, consistent with a net competitive effect (e.g., Zantout and Tsetsekos, 1994; Chen, Ho and Ik, 2005; Chen, Ho, Shih, 2007).

report R&D separately in financial statements, yet these firms report substantially more patents than R&D announcers, indicating disclosure avoidance of highly valued projects, possibly for competitive reasons. Knowledge spillovers at the input (R&D investment) and output (i.e., new products, services) stage are also likely to have significant economic implications for firms, especially if they are unable to fully appropriate the full economic rents from investment, possibly due to imitation by rivals.

The introduction of a SBCDP in Australia, if judiciously enforced, increases the costs of non-disclosure (through penalties imposed by the ASX), so managers are likely to consider the net position by setting the benefits of non-disclosure (competitive advantage) against the costs of non-disclosure. By focusing our analysis on firms who make more innovative-type investments, our study provides a novel setting for testing the impact of the change in disclosure regulation.

We begin our empirical analysis by tracking all ASX listed firms that made CAPEX, R&D and IT investments over the period 1991 to 2012. The investments are time-stamped by the ASX, thereby verifying disclosure, and flagged as 'price-sensitive' indicating that their announcement is expected to have valuation consequences. This period covers a pre (1991-1993) and post-SBCDP adoption (1995 to 2012) period. The post-adoption period also includes several amendments to the SBCDP policy, mostly with respect to tighter regulatory control and stiffer penalties for non-disclosure. We first examine if the introduction of the SBCDP policy in 1994 led to a significant increase in the likelihood of firms disclosing expenditures on price-sensitive investments (controlling for other factors that might correlate with investment propensity). Whilst our focus is on the impact of the change in policy on disclosures of R&D and IT investments, we also examine CAPEX investments, which serve as a useful benchmark. Specifically, we expect to find a larger increase in the likelihood of disclosing CAPEX investments relative to R&D and IT post SBCDP adoption, since we expect the costs (penalties) of non-disclosure for CAPEX investments to outweigh the benefits (competitive advantage). Given the likely greater competitive benefits to R&D and IT investments, we predict a less significant change to investment disclosure likelihood post SBCDP adoption.

We find evidence broadly in support of our predictions. Using binomial logit models, and controlling for firm level, industry, time and broad macroeconomic indicators, we show that the likelihood of disclosing any price-sensitive investment actually declined significantly for periods immediately after the adoption of the SBCDP. We only find significant evidence of increased likelihood of disclosure of investments for years after 2003. This is not too surprising, since stronger enforcement powers and penalties for non-disclosure only became operational during this time period. For example, legislation to prevent false markets occurring, and additional powers to allow ASIC to enforce infringement notices only became operational in 2003 and 2004, respectively.

Multinomial logit models comparing the likelihood of disclosing IT and R&D investments relative to CAPEX show that the former investments were significantly less likely to be disclosed compared to CAPEX immediately after the adoption of the SBCDP. This remained the case for R&D investments even after 2003 when the costs of non-disclosure are likely to have increased in line with new penalties. Post 2003, we do not find any significant difference in the disclosure likelihood of IT and CAPEX investments. The continued lower likelihood of disclosure for R&D expenditures is consistent with the view that these investments are more strategic in nature, and likely involve greater costs for firms if disclosed, even with increased penalties.

We next examine the market reaction to the disclosure of investment announcements over the sample period. Following from our first hypothesis, if the introduction of SBCDP increases the likelihood of disclosure, this should result in increased transparency, reduced information asymmetry, and a greater consensus amongst investors about the valuation consequences of the announced investments. We expect mean risk-adjusted returns to be higher post SBCDP adoption for all investments, albeit with a smaller magnitude for more innovative investments due to a lower expected likelihood of full disclosure when compared to CAPEX. We find some evidence of increased abnormal returns for firms disclosing CAPEX investments, but abnormal returns to R&D investments appear to be uncorrelated with changes in regulation, and remain fairly constant over the sample period. We interpret the evidence as providing mixed support for our hypothesis that all investments should enjoy greater abnormal returns post regulation change.

The remainder of the paper is structured as follows. Section 2 provides some background on the development of a SBCDP in Australia, and formulates the hypotheses to be tested. Section 3 outlines the data and reports some summary statistics. Section 4 reports the econometric methods used, and the findings from the empirical analysis. Section 5 concludes with a summary, and some implications of our findings for the key regulatory bodies.

2.0 Background and hypotheses development

2.1 Background

Australia's statutory-backed continuous disclosure policy was introduced in 1994, with the Australian Securities Exchange (ASX) given the responsibility of overseeing enforcement. The motivation for its introduction can largely be explained by the increase in incidences of low quality firm disclosures, unexplained price movements, diminishing investor confidence in financial data and stock prices, and the resultant increase in corporate failures in the mid to late 1980s (Brown, Taylor and Walter, 1999). Over the years, the policy has been amended to increase compliance, but its core regulatory requirements and objectives remain largely unchanged (Gallery et al. 2010). The key amendments are reviewed below.

In the early period after adoption (between 1994 and 1997) the new policy faced significant criticism mostly due to apparent lack of compliance and enforcement (Guo, 2011). For example, during this period, the ASX made several referrals for non-disclosure to the Australian Securities and Investments Commission (ASIC), but no penalties were imposed on the firms involved. In 1998 ASIC was granted the power to impose enforceable undertakings (EU) on firms for breaching the disclosure rules as set out in Listing Rule 3.1 of the Companies Act.[2] This power enabled ASIC to

[2] ASX Listing Rule 3.1 requires that the company immediately notify the ASX of: '*Any information of which the Company becomes aware, concerning the Company that a reasonable person would expect to have a material effect on the price or value of any securities issued by the Company'.* The continuous disclosure policy (also set

impose its first EU against Crown Casino in August 1998 for breaching continuous disclosure policy (Guo, 2011).

On 30 September 2001, Guidance Note (GN) 8 was reissued and Listing Rule 3.1 was amended by the ASX. The amended GN provided further guidance on the application of the continuous policy rules. Specifically, firms were required to disclose information that may have a material effect on their revenues, profits and shares price. GN 8 provided the circumstances under which these disclosures should be made.

On 1st January 2003, ASX Listing Rule 3.1B was introduced to address the likelihood of a false market occurring in a firm's securities, and if so, the requirement that the firm must provide the necessary information to correct or prevent a false market. In 2004, the legislation was further amended to improve the range of ASIC's powers, which enabled it to impose its first successful infringement notice for non-disclosure in 2005 on Aristocrat Leisure. The case was settled in 2008 for an amount of $144.5 million (Guo, 2011).

In October 2012, the ASX released a consultation paper on additional changes in GN 8. The amended GN 8 provided more detailed guidance for firms in dealing with comments and speculation in the media, by analysts and market rumours.

2.2. Hypotheses development

The decision by managers to disclose investment expenditures when they arise is a function of the costs and benefits of disclosure. For investments deemed profitable (i.e., have a positive net present value) by investors on average, the key benefit for the firm is an immediate increase in the firm's share price and hence, shareholder value. The announcement of profitable investments also provides investors with valuable information on the firm's growth options, and the quality of management. Disclosure should reduce investor uncertainty related to the firm's future growth options, and facilitate more accurate firm valuation. Lastly, firms benefit from greater investment

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out in Section 675 of the Corporations Act 2001) also states that material information must not be selectively disclosed (i.e., to analysts, the media or customers) prior to being announced to the ASX.

disclosure by avoiding possible penalties and attention from regulators who are likely to query significant unexpected price changes.

The costs to the firm from the immediate disclosure of valuable investments relate primarily to possible loss of competitive advantage, since rivals will have gained valuable information on the announcing firm's growth options. Maintaining competitive advantage is important for all firms, but is especially significant for firms in highly competitive sectors were product and service innovations are crucial in firm growth and ultimate survival. While all investment types are likely to impact on a firm's ability to successful compete, expenditures in R&D and IT are likely to have a greater impact given their stronger correlation with innovation and firm growth. When a firm announces significant R&D and IT investments, rivals can use this information to inform their strategic policy, and the relative value of their own growth options.

A change in regulation from a continuous disclosure policy to one that is statutory-backed and enforced should increase the costs of non-disclosure through larger penalties and greater regulatory oversight. The increase in costs should, holding other factors constant, increase the likelihood of investment disclosures since managers will want to avoid large penalties for non-disclosure. However, the increase in costs may not be sufficient to encourage greater disclosure of more innovative investments, which are more valuable to the firm in maintaining competitive advantage. If the introduction of a SBCDP has been effective, we should see increased disclosure likelihood of investment expenditures when they occur, although given larger costs associated with the disclosure of more innovative investments, the increase in disclosure is predicted to be lower than traditional CAPEX. We formulate our first hypothesis as:

H1: The introduction of a SBCDP causes an increase in the likelihood of firms making investment disclosures. The increase in likelihood will be greater for investments in CAPEX, relative to more innovative investments, defined as R&D and IT.

Greater disclosure, on average, is also likely to impact on investors' ability to more accurately value firm investments. If managers provide more detailed information about forecasted investment cash flows, financing and growth, the reduction in information asymmetry and uncertainty should allow investors to better value these investments. This is because the increase in information reduces the variation in investor valuations, allowing for a greater consensus or a lower dispersion, on average, in investor opinion.

In the context of the traditional model of firm value, market value is equal to the present value of future earnings expected to be generated by existing assets, plus the net present value of all available investment opportunities to the firm (Miller and Modigliani, 1961). If managers act to maximize shareholder value (i.e., only accept positive net present value projects), then the announcement of an 'unexpected' increase in investment should have a positive impact on the market value of the firm (Fama and Miller, 1972). The upward revaluation of the firm is due to investors capitalizing on announcement the positive net present value associated with the unexpected investment announcement. However, due to agency conflicts (Jensen and Meckling 1976), not all managers will act in shareholder interests, so some investments could be poorly conceived, unnecessary, and so reduce firm value when announced (i.e., negative net present value projects).

Investors have been shown to react 'rationally' to unexpected news about new investments. Prior studies show that the market generally reacts positively to unexpected announcements of CAPEX and R&D expenditures, or announcements that signal planned increases (e.g., through periodic budgets) in these expenditures (see, e.g., McConnell and Muscarella, 1985; Woolridge, 1988; Chen and Ho, 1997; Vogt, 1997; Brailsford and Yeoh, 2004, Eberhart, Maxwell, and Siddique, 2004; Lev, Sarath, and Sougiannis, 2005; Ali, Ciftci and Cready, 2011). Nevertheless, investments in more innovative investments, including R&D and IT expenditures, may produce greater uncertainty, due to poor disclosure (i.e., insufficient information), uniqueness, or lack of organized markets that might help establish comparable pricing information (Aboody and Lev, 2000). This could make it difficult for investors to distinguish between expenditures that will increase firm value from ones that will not (Samuel, 2000; Boehmer and Wu, 2008).

Following from hypothesis 1 above, we expect an increase in disclosure post SBCDP adoption, albeit more muted for more innovative investments. The increase in investment-specific information allows investors to more accurately value new investments, reducing information asymmetry and the dispersion of investor opinion about investment value. Given the greater consensus on investment value, we expect announcement abnormal (risk-adjusted) returns to investments to be greater post SBCDP adoption. To the extent that disclosures are likely to be fewer or less transparent for more innovation-type investments, we expect the increase in returns to be less significant in magnitude relative to CAPEX.[3] We formulate hypothesis 2 as follows:

H2: The introduction of a SBCDP causes an increase in the announcement abnormal returns to investment disclosures. We expect the impact to be less significant in magnitude for more innovative investments, defined as R&D and IT.

3. Data and sample construction

3.1 Data

To test hypothesis 1 and 2, the study utilizes a unique and novel dataset sourced directly from the ASX, comprising of all capital and non-capital expenditure announcements disclosed by firms over the period 1991 to 2012. As companies are required to disclose all material 'price-sensitive' information in accordance with the ASX listing rules, the sample includes every relevant investment announcement disclosed during this period. In addition, this should greater confidence in the

[3] The impact of increased non-disclosure penalties is also likely to influence the choice of which projects to disclosure. If firms, on average, endogenously disclosure more highly valued projects pre SBCDP, the increase in the number of lower valued projects post SBCDP should depress returns. On the other hand, competitive pressures may reduce disclosure likelihood of highly valued projects pre SBCDP resulting in an increase in their disclosure post SBCDP (due to increased non-disclosure costs), and higher returns.

accuracy of the information provided in the announcements, as it is first-hand and sourced directly from the announcing firms, as opposed to media and news service providers.

Consistent with prior studies (Chung et al. 1998; Brailsford and Yeoh, 2004), all investments are defined as announcements of expenditure on new investments. Progress reports or commitments to ongoing projects are excluded, as most of the expectations surrounding these investments would have been priced into the original announcement. Importantly, the announcements are surprise or unexpected news events because Australian firms do not provide beginning of the year guidance (as in, e.g., the US) on expected total investment spend. Instead, expenditure announcements are made throughout the financial year, and are largely unpredictable events.

Capital expenditures are defined as purchases of property, plant and equipment, or other assets that are strictly physical in nature. This includes purchases of existing assets from businesses, but excludes corporate acquisitions, acquisition of minority stakes and subsidiaries, tender offers, strategic alliances or joint ventures. Also this specifically excludes maintenance expenditures as these are not associated with increased production capacity or employment, and are operating items that are expected by the market.

R&D expenditure is defined as the expenditure on research, development and the introduction of new technologies, products or processes. Similar to CAPEX, we do not include the acquisition of R&D through mergers or business combinations since it would be difficult to disentangle the market's response to the acquisition of R&D from the broader effects of the merger, as examined under hypothesis 2. Under Australian Accounting Standard Board (AASB) 1101, most R&D is expensed unless future benefits are likely to eventuate beyond reasonable doubt, in which case it can be capitalized. We focus our attention on only expensed R&D since the capitalization of R&D is a fairly rare event, and it tends to be announced alongside year-end earnings announcements, resulting in contamination when examining the announcement returns to these investments (Brailsford and Yeoh, 2004). Focusing only on expensed R&D also facilitates more direct comparisons with prior international studies (e.g., US and UK), where expensing only is more the norm.

Announcements also have to give specific details about the intended research efforts. Commonly stated objectives include the development of new or improved products with higher profit margins, or improving the overall product mix to boost market share.

IT expenditures are defined as the expenditure on information or communication technologies, new systems, hardware or software of a material and/or price-sensitive nature. IT announcements are classified according to criteria often used in the information systems literature. This paper is only interested in announcements that incur an actual dollar spend, making them more comparable to CAPEX and R&D investments.[4] Common examples include online and e-commerce investments, investments in new information systems, communication systems and technologies.

3.2 Sample construction

The sample was self-constructed from ASX announcements data provided by the Securities Industry Research Centre of Asia-Pacific (SIRCA). The announcements were taken across the whole market for the period 1991 to 2012, and thus were not restricted to any one market index or industry. Announcements were then filtered according to the following criteria:

1. The announcement had to be classified as 'price-sensitive' by the ASX, meaning that only material investment announcements are used. Announcements had to be directly pertinent to capital and non-capital spending decisions, at either the corporate or divisional level, based on the aforementioned definitions. CAPEX announcements were largely sourced from Sub-code 07 – 'Asset Acquisitions', based on ASX announcement classifications. R&D announcements were largely sourced from Sub-codes 11 and 14 – 'Progress Report', and 'Other', based on ASX announcement classifications. IT announcements were largely sourced from Sub-groups 7, 11 and 14, as defined above.

[4] Prior to 2000, it was mandatory for Australian firms to disclose Y2K compliance. Since we are only interested in disclosures that involve an actual dollar spend, these disclosures would be excluded from our analysis.

2. Announcements had to contain definitive plans rather than conjectures about the future.

3. In testing hypothesis 2, the additional requirement is imposed that announcements had to be made in isolation of other announcements that occurred within five days on either side of the announcement. This procedure minimizes the effect of extraneous information on stock prices. Extraneous events include: earnings announcements, final or interim; merger and acquisition announcements; profit or dividend forecasts; major board restructurings; delisting's and relisting's; exploration findings; management buy-outs or buy-ins; major asset disposals; progress reports on major projects and the taking of a notifiable interest in another firm's shares or vice-versa.

4. Announcements had to be made by firms whose complete daily returns data during the study period was available from SIRCA and/or Thomson Financials DataStream, and had financial accounting data also available from SIRCA or Huntley's Aspect Financial database.

Requirement 2 has the largest impact on sample size, followed by requirement 3 and 4. Most of the announcements excluded from the sample were due to vagueness about the investment and its timing. Clearly, while the ASX listing rules and the Australian Corporations Act require Australian firms to disclose price-sensitive information, the large number of announcements without detailed definitive investment plans suggests some level of vagueness, intended or not, by managers.

Applying criteria 1 and 2 gives a sample size of 10,365 investment announcements disclosed by listed firms. The vast majority of these relate to CAPEX at 9,195, followed by IT at 587 and R&D at 583 announcements. Applying criteria 3 and 4 further significantly reduces the sample size to 6,437, comprising of 5,819 CAPEX disclosures, 251 IT disclosures and 367 R&D disclosures. The reminder of the sample comprises of approximately 31,000 observations, which represent non-announcing or disclosing firm-years.

Insert Table 1 about here

Table 1 reports the breakdown of investment announcements disclosed by firms over the sample period. Disclosures generally increase overtime for all investment types, and decline as expected for post financial crisis years (2008). The dotcom period is also evident with a marked increase in IT investment disclosures over the 1998 to 2000 period. There is also a notable increase in R&D disclosures in 1999 and 2000, which is likely explained by a more general dotcom effect.[5]

4. Empirical analysis and results

4.1. Did the introduction of the SBCDP increase the likelihood of investment disclosure?

To test our first hypothesis, we employ binomial and multinomial logit models to examine if the introduction of the SBCDP was associated with an increase in disclosure probability or likelihood. The binomial models examine the likelihood of a firm disclosing any investment relative to no disclosure. The multinomial models compare the post SBCDP likelihood of disclosing R&D and IT investments relative to CAPEX. Since we cannot observe the counterfactual (i.e., firms that do not disclosure price-sensitive investments) the models compare those that invest and disclose their investments to the market with those that do not announce investments. Since we are primarily interested in how disclosure (investment) likelihood changed overtime, and subsequent to regulation change, the modelling approach followed should capture the impact, if any, of SBCDP adoption, and of subsequent amendments. Formally, the following binomial specification is estimated:

$$\text{Prob}_{i,t} = \alpha + \beta \text{PostSBCDP}_i + \Phi \text{X}_{i,t} + \delta_t + \lambda_{i,t} + \varphi_t + \varepsilon_i \quad (1)$$

[5] Part of the increase could be explained by the change in R&D tax concession rates introduced in 2001. From 2001, firms could claim a 175% (premium) tax concession (an increase of 50% on year 2000 rates), but this only applies to unexpected or above average (based on prior 3 years) increases in R&D labour-only related costs, so is unlikely to explain the increase in investment. Further, the observed increase in R&D occurs before the introduction of the new R&D tax rates.

Where $Prob_{it}$ is the probability that firm *i* discloses an investment at time t, and is equal to 1 for firms that disclose *any* investment over the sample period, and 0 for non-disclosing firm-years. We report odds ratios (rather than logit coefficients) for ease of interpretation. βPostSBCDP is a dummy variable taking a value of 1 for post SBCDP years, and 0 for pre years. We use two periods to define post SBCDP years. The first is 1994, which was the year the SBCDP was introduced. The second is 2003, which was the year that the legislation was amended to strengthen enforcement and increase penalties for non-disclosure. ΦX_{it-1} is a vector of firm-level characteristics measured the year prior to disclosure announcement, δt reflects several time-varying broad economic factors, λit are industry dummies, φt captures linear and non-linear time effects, and εi are robust-clustered (firm level) error terms.

For the firm-level characteristics (ΦX_{it-1}), we include typical variables to capture firm size (lnassets), liquidity (cash_assets), leverage (Debt_assets), growth prospects (Tobin's q), and profitability (EBITDA_assets). The literature shows more generally that larger, more profitable firms, and firms with greater liquidity, lower debt, and higher growth options are more likely to undertake investments. Hence, we assume that these characteristics also correlate with greater disclosure likelihood. Morck, Shleifer and Vishny (1990) show that prior firm performance is an important attribute in predicting investment success, since good managers are better than bad managers at making investment choices. An alternative hypothesis posited by Roll (1986) is that better firm performance prior to investment gives rise to possible managerial overconfidence or hubris, so predicting a positive correlation between accounting performance (EBITDA_assets) and investment likelihood, but a negative correlation with announcement returns, due to greater risk of overpayment.

The literature also shows that firms with a mis-match between liquidity and growth options are likely to waste cash resources on investments. Jensen's (1986) free cash-flow hypothesis predicts that firms with cash in excess of that required to fund positive net present value projects are likely to waste it on unprofitable projects, rather than return it to shareholders in the form of dividends or share repurchases. Such firms are likely to have self-serving managers, and suffer from severe agency problems. To capture the agency costs arising from the existence of free cash-flow we include an interaction term in the models to capture high cash, low growth firms. High and low values are defined relative to a firm's industry average for cash-holdings and Tobin's q for the year prior to investment disclosure. We also include a proxy for the level of industry competition in a firm's industry (herfindahl index) since the literature shows that industry competition can influence investment likelihood, and the returns from investment. To capture the impact that the dotcom boom period had on the likelihood of investing, especially IT investments, we include a dummy (DCboom) that takes a value of 1 for dotcom boom years (specifically, 1998-2000), and 0 otherwise.

To capture time-varying broad economic factors (δt), we include measures to capture economic growth (GDP growth, GDP per capita), inward foreign direct investment (FDI_GDP), borrowing costs (borrow_rate), inflation, and stock market equity returns (S&P_index). These factors have been well documented in the literature as important in determining the likelihood of investment.

Lastly, the models include 10 broad sector industry dummies (9 to avoid the variable dummy trap) to capture industry-fixed effects. Further, given the likely importance of time-effects in determining investment likelihood, we capture this using both a linear and non-linear time trend, which takes a value of 1 for the beginning of the sample period (1990), and increases by 1 for each subsequent year (Time). The non-linear factor is calculated as $Time^2$. We also use year dummies in alternative model specifications to ensure our results are robust to time-effects (see the appendix for detailed definitions of all variables used in the models).

The multinomial models use the same independent variables as (1) above. The dependent variable ($Prob_{i,j,t}$) for this specification is the probability that firm *i* discloses investment *j* at time *t*, and is equal to 1 for firms that disclose an IT investments, 2 for firms that disclose an R&D investments, and 0 for firms that announce CAPEX investments. This allows us to more directly test for significant differences in the likelihood of disclosing IT and R&D investments relative to CAPEX.

Table 2 reports some summary statistics for the variables used in estimating our binomial and multinomial logit models. All continuous variables are winsorized at the 1% level at both tails to reduce the impact of extreme values.

Insert Table 2 about here

The statistics report the breakout by investment disclosure type (including non-disclosure firms) and show that characteristics not only differ across disclosing and non-disclosing, but also across investment disclosure type. Disclosing firms are generally larger (although R&D are, on average, smaller) firms with higher growth options (Tobin's q). R&D disclosing firms tend to smaller firms that hold more cash, have lower debt, and greater growth options than other categories. They are also the least profitable, have the highest proportion of firms with both high cash, but low growth, and tend to belong to more concentrated industries (Herfindahl index). The characteristics are generally consistent with the view that R&D intensive firms retain high liquidity and low debt for precautionary motives, arising from higher growth options on average. On the other hand, IT firms are the largest firms on average, and appear to be more profitable than other categories. Not surprisingly, most (58%) IT investments occurred during the Dotcom boom period.

Insert Figure 1 about here

Figure 1 shows the average investment disclosure frequency over the sample period. Disclosures of R&D and IT investments appear to have peaked around the year 2000, with a significant decline for IT following the Dotcom 'bust' period, and a more gradual decline in disclosures for R&D, but more dramatic over the financial crisis period. CAPEX disclosures have increased markedly, peaking in 2007, followed by significant declines over the financial crisis period.

4.1.1 Regression results: Binomial logistic models

The reported coefficients for the binomial logistic models in Table 3 are odds ratios, so values greater (lower) than 1 indicate that the variable has a higher (lower) odds in explaining the likelihood of disclosing *any* investment expenditure. To show that our findings are robust to linear and non-linear time effects, we estimate regression specifications without (model 1 and 2) and with (model 3 and 4) time trend variables. We use two time dummies (post 1994 and post 2003) to capture the impact, if any, of regulation change, and subsequent significant amendments (as in 2003).

The results from models that do not control for time effects strongly suggest that the likelihood of investment disclosure increased significantly after the introduction of the SBCDP, and after subsequent amendments in 2003. The odds ratio of over 3 suggest that firms were on average 3 times more likely to disclose *any* investment post SDCDP adoption, and post amendment, compared to the pre-adoption (amendment) period. Clearly, however, part of this increase in disclosure could simply arise from other factors. The results of model 3 and 4 strongly suggest that a large part of the increase is due to time effects. In fact, the results show that post SBCDP adoption, firms were significantly less likely to disclose as indicated by the <1 (0.686) odds ratio. Time effects account for a large part of the increased disclosure observed in models 1 and 2, as indicated by the >1 odds ratio for the time variable (1.736). The results do, however, show an increased likelihood of disclosure post 2003, a period highlighted by tougher legislation and stronger penalties.

Insert Table 3 about here

The models also provide some insights into which firm level and broader macro factors correlate with increased investment disclosure. Larger, high-growth (Tobin's q) firms with greater cash-holdings and less debt are more likely to disclose. Clearly, the literature shows that these factors correlate with greater investment likelihood (and returns), so the results are consistent with prior investment studies (e.g., McConnell and Muscarella, 1985; Lang, Stulz and Walkling, 1991; Harford, 1999; Vogt, 1997; and Brailsford and Yeoh, 2004). The results also provide strong support of Jensen's (1986) free cash flow theory with greater investment likelihood for firms that have both higher cash-holdings, but lower growth options. Jensen argues that free cash flow is likely to give rise to related agency costs, as manifested in the selection of unprofitable investments (i.e., negative net present values). We will return to this issue later in the paper when we examine the announcement returns to investment disclosures in hypothesis 2.

Several broader macro factors and industry characteristics also have a significant impact on investment disclosure likelihood. Industry concentration, however, has the largest impact with an odds ratio of over 4, suggesting that belonging to a more concentrated industry increases the odds of investment disclosure by a factor of 4 relative to non-disclosing firms. The literature does show (e.g., Doukas and Switzer, 1992) that higher concentration, and arguably greater market power, is important with respect to investment efficiency and profitability, specifically for more innovative investments, such as R&D. In the next section, we specifically examine if regulation change had a different impact on more innovative investment disclosures relative to CAPEX.

4.1.2 Regression results: Multinomial logistic models

Table 4 reports the results for the multinomial logistic models. Similar to the binomial models, odds ratios are reported to better facilitate interpretation. The models compare investment disclosure likelihood of R&D and IT expenditures relative to CAPEX. Hypothesis 2 predicts that these investments, due to their more innovative, and possibly greater strategic importance, are less likely to be disclosed by firms due to larger costs related to competitive advantage. Table 4 presents 8 model specifications, 4 of which do not control for time effects (models 1 to 4), and 4 that include linear and non-linear time trend variables (models 5 to 8). Models 1 and 2 show the impact of the introduction of the SBCDP in 1994 on IT and R&D investments, respectively. The odds ratios are less than 1, but statistically insignificant indicating no significant impact. Models 5 and 6 include time controls, and provide some evidence that IT and R&D investment disclosure likelihood declined (odd ratios <1) significantly post SDCDP adoption relative to CAPEX. The impact of the 2003 amendments also appears to have had a significant impact on R&D disclosures relative to CAPEX, but not for IT.

The results also show that several firm, industry and broader macro factors are important, and have a differential impact on investment type. Notably, and not surprisingly, the Dotcom boom has a significantly larger impact for IT investments, with an odds ratio between 4 and 5. Industry concentration (herfindahl index) also appears to have a much larger impact on R&D investment disclosures relative to CAPEX, with an odds ratio between 7 and 8. Clearly, industry concentration and related market power is an important factor for R&D investments, and is likely due to greater efficiency requirements for R&D that arises from greater concentration (Doukas and Switzer, 1992).

Insert Table 4 about here

Taking the binomial and multinomial results together, the findings provide some support for hypothesis 1, with increased disclosure likelihood after regulation change, which is more evident for the post amendment period after 2003. The results also show that relative to CAPEX investments, R&D investments are less likely to be disclosed post regulation change.

4.2. Did the introduction of the SBCDP impact on investment announcement returns?

To measure whether the stock market's response to CAPEX, R&D and IT investment disclosures changes post SBCDP adoption or after subsequent amendments (Hypothesis 2), we use a standard event study methodology. The market's (investors') response to disclosures is captured by calculating abnormal returns and summing them around different event windows. The reported event windows are defined as 3-day (t-1 through to t+1), 5-day (t-2 though to t+2), 7-day (t-3 through to t+3), and 11-day (t-5 through to t+5) in relation to the disclosure announcement date, t=0. Abnormal returns are calculated as the actual return observed on day (t) less the expected return. We calculate expected returns for each disclosing firm by estimating a market model, and use the fitted parameters (alpha and beta) to calculate expected returns. The parameters are estimated using OLS regressions, where the return on each investment-disclosing firm is regressed on the market return, proxied using the ASX All Ordinaries index. The estimation period used to calculate the parameters of the market model is 200 days, starting -211 days to -11 days prior to the investment disclosure announcement. Cumulative abnormal returns (CARs) sum abnormal returns over the event window for each announcing firm and so capture the market's response to the unexpected investment disclosure.

To specifically examine if the introduction of a SBCDP or subsequent amendments impacted on the announcement returns to investment disclosures, we estimate the following OLS regression model:

$$\mathrm{CAR}_i = \alpha + \beta \mathrm{PostSBCDP}_i + \Phi \mathrm{X}_{i,t} + \delta_t + \lambda_{i,t} + \varphi_t + \varepsilon_i \qquad (2)$$

Where CAR_i is the cumulative abnormal return for firm i, measured as the 3, 5, 7 or 11-day CAR for the disclosed investment, and βPostSBCDP is a dummy variable taking a value of 1 for post SBCDP years, and 0 for pre years. The terms ΦX_{it-1}, δt, λit, and φt are defined as in model (1) above.

Insert Table 5 about here

Table 5 reports some summary statistics for CARs (Panel A) and differences in CARs pre and post SBCDP adoption, and post amendments in 2003 for the different investment categories, including all disclosing (investing) firms.[6] In general, the CARs are fairly small, ranging from about 0.22% to 0.50% for all investment types, and tend to increase with the length of window used to cumulate the abnormal returns. Surprisingly, there appears to be little evidence that CARs differ, on average,

[6] We do not report summary statistics for firm, industry and macro variables as they are identical to those reported in Table 2 (Panels B-D).

across investment types, although this may become more evident when we control for firm, industry and other factors in our multivariate regression analysis.

Insert Figure 2 about here

Figure 2 provides an initial view of whether CARs differ markedly overtime, and shows some evidence of large variations, especially post 1994 for CAPEX. As expected, IT investment disclosures peaked during the Dotcom bubble, and then experienced significant declines, including several years of negative CARs from 2004 to 2008. Returns to R&D, on the other hand, appear to be more consistent overtime.

Insert Table 6 about here

Table 6 provides more 'statistical' univariate evidence of differences in mean CARs, or cumulative average abnormal returns (CAARs). The results confirm the trends in Figure 2, with significant increases in returns, on average, post 1994 relative to pre 1994, followed by significant declines post 2003 for all investments. This trend is largely explained by CAPEX and IT investments, whereas R&D experiences no significant change over the sample period.

Insert Table 7 about here

To get a better understanding of what factors drive investment disclosure announcement returns, we first estimate some baseline regression models (i.e., excluding the SBCDP dummy variables), as specified in (2) above. Table 7 reports the results for 8 model specifications, with 4 models (models 1 to 1: All, CAPEX, IT, R&D) for each investment category excluding time trend variables, and 4 models (5 to 8) including time trend variables. The results show that larger firms generate higher abnormal returns when disclosing CAPEX investments, but lower returns to R&D. Some evidence is provided to support Jensen's (1986) free cash flow hypothesis, but is specific to CAPEX investments, where arguably greater scope exists for value-destroying projects. Interestingly, more profitable firms (EBITDA_assets) generate lower announcement returns, which is concentrated in CAPEX only. This provides further support for the view that overconfidence or hubris, which may arise in more profitable firms, can result in poor investment decisions (Roll 1986).

Insert Table 8 about here

Table 8 reports regression models that specifically test if 3-day CARs differ for R&D and IT investment disclosures relative to CAPEX post SBCDP adoption, and amendments in 2003. As before, we estimate models that exclude time effects (models 1 and 2), and models that include these (models 3 and 4). The interaction terms that capture the impact for IT and R&D investment disclosures show that after controlling for firm-level variables, industry, broad macro variables and time trends, there is no significant difference in CARs relative to CAPEX for the post 1994 or post 2003 periods. The positive and significant coefficients on the post 1994 dummy indicates that only CAPEX experienced a significant increase in CARs, on average, for the post 1994 period. The results for the other control variables are consistent with those reported in the baseline models in Table 7

Table 9 reports the results using 11-day CARs, and provides some additional evidence of significantly lower CARs (negative interaction term) for IT investments post 2003 amendments to the SBCDP. Overall, the results provide mixed support for hypothesis 2 in that only CAPEX investment disclosures are shown to have generated significantly higher returns post SBCDP adoption, but no significant change for IT or R&D investment disclosures.

5. Concluding comments

The paper provides some evidence that the introduction of a SBCDP in Australia increased investment disclosure likelihood by firms, but only after the adoption of legislative amendments and tougher penalties introduced in 2003. Taking a closer look at investments by type, the results show that innovative disclosures were generally unaffected by the SBCDP, with some evidence of lower disclosure likelihood for R&D relative to CAPEX. The findings are broadly in line with expectations that disclosing more innovative-type investments are likely to incur greater costs for firms in terms of loss of competitive advantage, and that these costs are likely to be greater than the costs or penalties imposed for non-disclosure.

We find that announcement abnormal returns increased on average post SBCDP adoption, but that this is limited to disclosures related to CAPEX investments. Controlling for the Dotcom period, we also report some evidence of a significant decline in returns to IT investment disclosures for post 2003 years. Key firm level and industry factors that are correlated with greater disclosure likelihood and announcement returns include firm size, a mismatch between cash-holdings and growth, and industry concentration.

5.1 Some implications

The results provide some evidence broadly in support of the SBCDP, especially after amendments in 2003 and 2004. The stronger results for the post 2003 period suggests that changes in regulation are only likely to be effective if policed properly through regulatory agencies (e.g., through infringement notices), and if penalties for non-compliance are significant. However, the findings also suggest that persuading firms to disclose more innovative investments through regulation change might be more challenging. Amendments to the legislation, along with tougher penalties appear to have had no impact on increased disclosure of IT and R&D expenditures. This suggests that when firms make these types of investments, the costs related to loss of competitive advantage through disclosure exceed any costs arsing from non-disclosure penalties. In making the decision of whether or not to disclosure, managers are also likely to factor in the likelihood that regulatory agencies will detect non-disclosure, so the effectiveness of policing non-disclosure is also likely to be considered by managers.

From a firm perspective, it is understandable why shareholder value-maximising managers might want to avoid disclosing more innovative expenditures, especially since firm long-run growth and survival depends on retaining competitive advantage over rivals. Firms that invest heavily in R&D and IT typically belong to more competitive industries, so investing in innovation and earning the full economic return is important for profitability and future growth. Knowledge spillovers, loss of competitive advantage, and the inability to earn full economic rents from investment in innovation provide a strong incentive to avoid disclosure. It is also well documented (Sorensen, 2006) that firms may underinvest in innovation due to knowledge spillovers and other market imperfections.[7] There is also a general belief amongst senior managers that investors, on average, do not fully price the valuation consequences of innovative investments (i.e., investors are myopic). This belief may also help explain underinvestment in innovation, and the lower likelihood of innovative expenditure disclosures as documented in this paper.

From a broader macroeconomic perspective, knowledge spillovers are important for economic growth (Jaffe, 1986; Lucas, 1988; Romer, 1986; Aghion and Howitt, 1992; Griliches, 1992). Spillovers enhance technological and innovation sharing, which is argued to promote greater innovation and public good benefits (e.g., lower cost outputs). Regulation on disclosure has an important role to play in increasing transparency for investors and other firm stakeholders. However, it also has a role in creating an environment that better supports country economic growth. Regulatory bodies therefore need to carefully consider the arguments for having a more open information environment that facilitates knowledge spillovers, and the likely disincentive for firms to invest and disclose investments, especially those that are more innovative.

[7] Most countries attempt to increase firm investment in innovation (specifically R&D) through publically funded grants, tax credits and a mixture of both mechanisms. This would suggest that firms, on average, underinvest in R&D, possibly due to the inability of firms to capture all the benefits of investment.

5.2. Limitations and future research

The empirical analysis is likely to suffer from some limitations, especially with respect to econometric and sample identification concerns. One econometric concern is omitted variables. We attempt to avoid this issue by including a comprehensive set of firm, industry, broad macro, and time factors in the regression models. These factors have been documented in the literature as important in explaining firm investment likelihood, and the returns to investment announcements. Since we also find many of these factors statistically significant in our models, we suspect that omitted variables is not a significant concern.

Another limitation in our approach relates to problems in identifying firms that should have disclosed investment expenditures, but did not. The disclosure likelihood models reported in the paper compare firms that actually made investment disclosures with firms that did not disclose (or disclosed CAPEX for relative models), a sub-set of which may have actually made 'price-sensitive' investments over the sample period. While our models control for characteristics that are correlated with investment likelihood, future research could focus on better identifying firms that invested, but did not disclose. Future research could use ASX price query data to better identify non-disclosing firms. ASX query data contains the names of firms that experienced unexpected prices movements (defined as changes greater than 15%), and their explanation, if any, for the unexplained price movement. These firms could serve as a useful benchmark to compare to a sample of disclosing firms, particularly for firms with unexpected price movements arising from the non-disclosure of investment expenditures.

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Appendix

Variable descriptions and definitions

Variable	Definition
Ln assets	Natural log of total assets
Cash_assets	Cash holdings/total assets
High_cash_dum x Low_q_dum	Interaction term to capture Jensen's (1986) free cash flow theory
High_cash_dum	Dummy variable =1 if firm cash-holdings > industry mean cash-holdings
Low_q_dum	Dummy variable =1 if firm Tobin's q < industry mean Tobin's q
Debt_assets	Short-term debt+long-term debt/total assets
Tobin's q	Market value of equity + total assets-book value of equity)/Total assets
EBITDA_assets	Earnings before interest, tax and depreciation/total assets
DCboom	Dummy variable = 1 for dotcom bubble years (1998-2000), and 0 otherwise
Herfindahl index	Measure of industry competition calculated for each industry-year as the sum of the squared deviations of market share, based on total sales
FDI_GDP	Foreign direct investment/GDP (source: World bank)
S&P index	Stock market return, calculated using the yearly return on the S&P index (source: World bank)
Borrow rate	Borrowing rate to proxy borrowing costs for the average firm (source: World bank)
Inflation	Inflation rate (source: World bank)
GDP growth	GDP growth rate (source: World bank)
GDP per capita	GDP per capita (source World bank)
Time	Linear time trend variable taking a value of 1 for 1990, and increasing by 1 for each year up to a maximum of 23 (2012)
$Time^2$	Non-linear time trend
Post_1994_dum	Dummy variable = 1 for post 1994 years (i.e., 1995 to 2012), and 0 for 1990 to 1994
Post_2003_dum	Dummy variable = 1 for post 2003 years (i.e., 2004 to 2012), and 0 for 1990 to 2003
CAPEX_dum	Dummy variable =1 for CAPEX investment disclosures, and 0 otherwise
IT_dum	Dummy variable =1 for IT investment disclosures, and 0 otherwise
R&D_dum	Dummy variable =1 for R&D investment disclosures, and 0 otherwise
CARs	Cumulative abnormal return, calculated as the sum of abnormal returns for each disclosing firm across different event 'window's (3-day, 5-day, 7-day, 11-day). Abnormal returns are calculated using the market model.

Figure 1
Average investment announcements per firm over the sample period

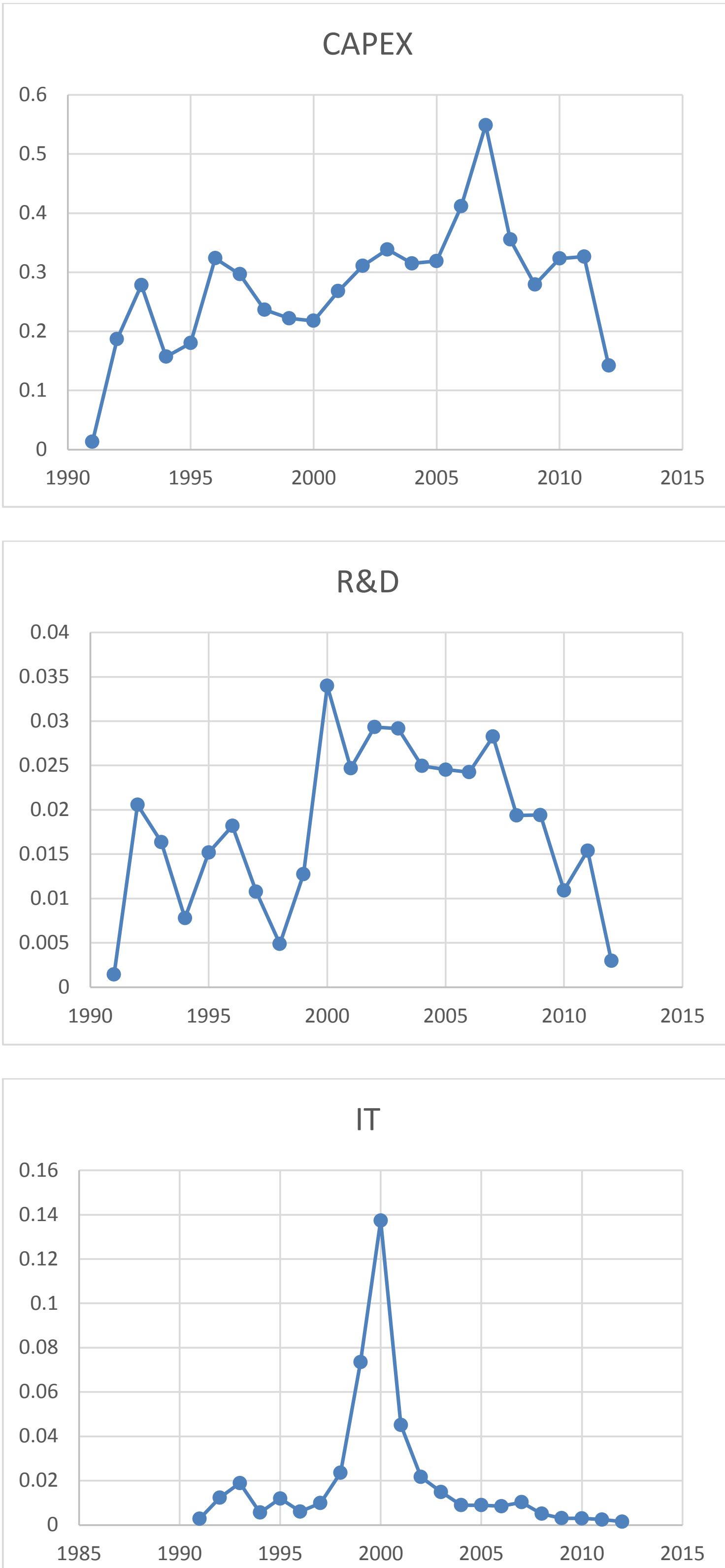

Figure 2
Average (mean) 3-day CARs over the sample period

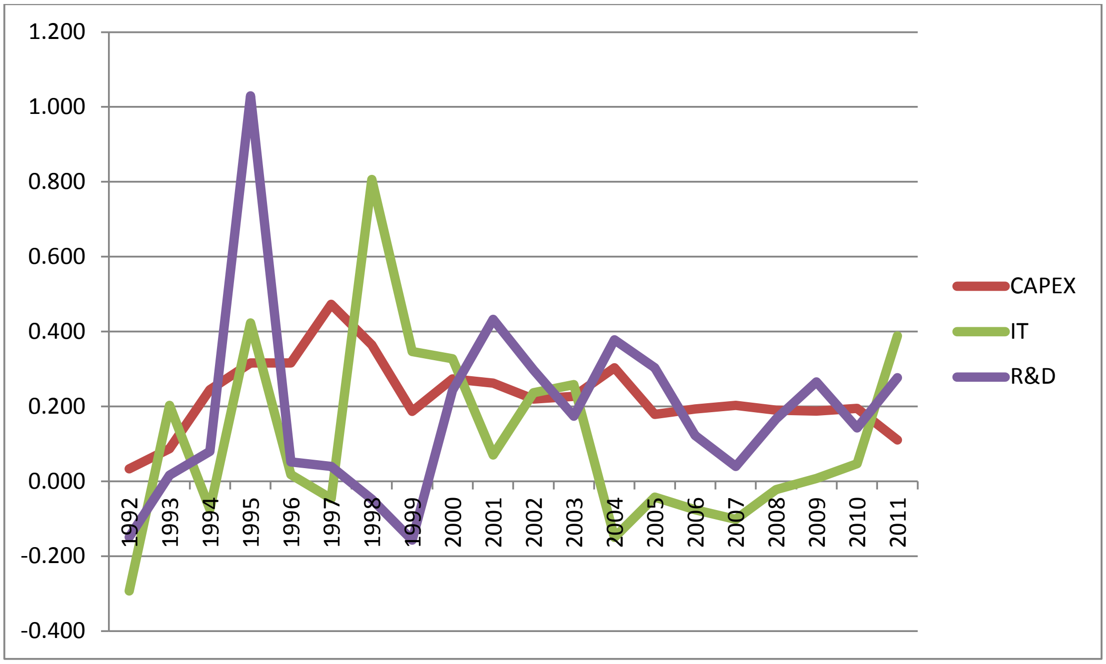

Table 1
Sample composition of investment disclosures over the sample period

Year	CAPEX	R&D	IT
1991	9	1	2
1992	136	15	9
1993	221	13	15
1994	141	7	5
1995	166	14	11
1996	320	18	6
1997	330	12	11
1998	291	6	29
1999	296	17	98
2000	301	47	190
2001	380	35	64
2002	445	42	31
2003	499	43	22
2004	492	39	14
2005	533	41	15
2006	730	43	15
2007	1,068	55	20
2008	697	38	10
2009	546	38	6
2010	651	22	6
2011	657	31	5
2012	286	6	3
	9,195	583	587

The Table reports the number of investment announcements disclosed by Australian listed firms over the sample period for CAPEX, R&D and IT investments.

Table 2
Summary statistics (Hypothesis 1)

Variable	Observations	Mean	p25	p50	p75
Panel A: Non-Disclosing firms					
Ln assets	31,231	17.335	15.671	17.050	18.788
Cash_assets	31,232	0.192	0.009	0.072	0.267
High_cash_dum x Low_q_dum	31,751	0.328	0.000	0.000	1.000
High_cash_dum	31,751	0.306	0.000	0.000	1.000
Low_q_dum	31,751	0.785	1.000	1.000	1.000
Debt_assets	31,232	0.141	0.000	0.012	0.222
Tobin's q	31,221	1.307	0.128	0.676	1.405
EBITDA_assets	31,232	-0.120	-0.138	0.004	0.113
DCboom	31,751	0.132	0.000	0.000	0.000
Herfindahl index	31,555	0.266	0.109	0.146	0.318
FDI_GDP (%)	31,751	2.769	1.549	3.170	4.279
S&P index (%)	31,751	9.967	-8.746	12.491	25.151
Borrow rate (%)	31,751	8.872	7.988	8.663	9.267
Inflation (%)	31,751	3.102	1.673	2.866	4.705
GDP growth (%)	31,751	3.239	2.239	3.698	3.945
GDP per capita (A$)	31,751	43,035	31,480	40,274	55,482
Panel B: CAPEX disclosing firms					
Ln assets	5,817	18.264	16.294	17.997	20.058
Cash_assets	5,819	0.206	0.008	0.089	0.316
High_cash_dum x Low_q_dum	5,819	0.328	0.000	0.000	1.000
High_cash_dum	5,819	0.292	0.000	0.000	1.000
Low_q_dum	5,819	0.775	1.000	1.000	1.000
Debt_assets	5,819	0.103	0.000	0.000	0.183
Tobin's q	5,819	1.565	0.546	0.929	1.763
EBITDA_assets	5,819	-0.078	-0.121	0.044	0.122
DCboom	5,819	0.084	0.000	0.000	0.000
Herfindahl index	5,819	0.329	0.111	0.184	0.417
FDI_GDP (%)	5,819	3.032	1.751	3.266	4.308
S&P index (%)	5,819	15.769	-0.278	17.931	28.583
Borrow rate (%)	5,819	8.457	7.988	8.413	9.058
Inflation (%)	5,819	3.580	2.564	3.708	4.983
GDP growth (%)	5,819	3.105	1.963	3.218	3.869
GDP per capita (A$)	5,819	46,046	38,362	48,233	55,482

Table 2 (continued)
Summary statistics (Hypothesis 1)

Panel C: IT disclosing firms	Observations	Mean	p25	p50	p75
Ln assets	251	18.560	16.872	17.953	19.611
Cash_assets	251	0.153	0.018	0.073	0.173
High_cash_dum x Low_q_dum	251	0.398	0.000	0.000	1.000
High_cash_dum	251	0.259	0.000	0.000	1.000
Low_q_dum	251	0.637	0.000	1.000	1.000
Debt_assets	251	0.127	0.001	0.055	0.195
Tobin's q	251	1.809	0.438	0.980	2.221
EBITDA_assets	251	0.020	-0.044	0.080	0.168
DCboom	251	0.582	0.000	1.000	1.000
Herfindahl index	251	0.273	0.071	0.163	0.433
FDI_GDP (%)	251	2.105	0.851	1.751	3.280
S&P index (%)	251	6.950	-8.746	1.014	18.184
Borrow rate (%)	251	8.658	7.988	8.663	9.267
Inflation (%)	251	2.139	0.769	2.564	2.866
GDP growth (%)	251	3.904	3.769	3.877	4.432
GDP per capita (A$)	251	36,116	32,788	34,519	36,345
Panel D: R&D disclosing firms					
Ln assets	367	16.984	15.753	16.842	17.798
Cash_assets	367	0.406	0.117	0.370	0.683
High_cash_dum x Low_q_dum	367	0.488	0.000	0.000	1.000
High_cash_dum	367	0.542	0.000	1.000	1.000
Low_q_dum	367	0.717	0.000	1.000	1.000
Debt_assets	367	0.070	0.000	0.000	0.068
Tobin's q	367	2.940	1.098	1.900	3.722
EBITDA_assets	367	-0.315	-0.506	-0.189	-0.024
DCboom	367	0.101	0.000	0.000	0.000
Herfindahl index	367	0.490	0.208	0.501	0.783
FDI_GDP (%)	367	2.835	1.719	3.280	4.279
S&P index (%)	367	13.567	-2.127	12.491	28.583
Borrow rate (%)	367	8.572	8.163	8.663	9.233
Inflation (%)	367	3.663	2.866	3.708	4.983
GDP growth (%)	367	3.126	2.239	3.218	3.869
GDP per capita (A$)	367	45,541	38,362	45,242	55,482

The table reports summary statistics for variables used in the regression analysis to test hypothesis 1. Statistics are reported for firms who do not announce (i.e., non-disclosing) a 'price-sensitive' investment expenditure (Panel A), CAPEX disclosing firms (Panel B), IT disclosing firms (Panel C) and R&D disclosing firms (Panel D). All variables are defined in the appendix.

Table 3
Binomial logistic (log-odds ratios) regressions (Hypothesis 1)

Variables	Post 1994 (1)	Post 2003 (2)	Post 1994 (3)	Post 2003 (4)
Post_1994_dum	3.651***		0.686**	
	(0.000)		(0.025)	
Post_2003_dum		3.017***		1.785***
		(0.000)		(0.000)
Ln assets	1.240***	1.246***	1.242***	1.242***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash_assets	1.861***	1.764***	1.460**	1.446**
	(0.000)	(0.000)	(0.014)	(0.016)
High_cash_dum x Low_q_dum	1.176***	1.192***	1.164***	1.167***
	(0.003)	(0.002)	(0.006)	(0.005)
High_cash_dum	0.791***	0.796***	0.864*	0.866*
	(0.007)	(0.008)	(0.096)	(0.100)
Low_q_dum	0.957	0.932	0.834***	0.843**
	(0.527)	(0.313)	(0.009)	(0.015)
Debt_assets	0.417***	0.400***	0.395***	0.395***
	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's q	1.096***	1.087***	1.071***	1.072***
	(0.000)	(0.000)	(0.000)	(0.000)
EBITDA_assets	1.087	1.048	1.062	1.055
	(0.180)	(0.446)	(0.325)	(0.384)
DCboom	0.925	1.228***	0.974	1.016
	(0.282)	(0.006)	(0.726)	(0.832)
Herfindahl index	4.288***	4.068***	4.175***	4.223***
	(0.000)	(0.000)	(0.000)	(0.000)
FDI_GDP	1.017*	1.023**	1.039***	1.049***
	(0.094)	(0.013)	(0.000)	(0.000)
S&P index	1.005***	1.001**	1.005***	1.003***
	(0.000)	(0.040)	(0.000)	(0.000)
Borrow rate	0.945***	0.770***	1.162***	1.058**
	(0.005)	(0.000)	(0.000)	(0.032)
Inflation	1.107***	1.166***	0.837***	0.856***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP growth	0.878***	0.904***	0.695***	0.667***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita	1.000***	1.000***	1.000***	1.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Time			1.736***	1.627***
			(0.000)	(0.000)
$Time^2$			0.957***	0.962***
			(0.000)	(0.000)
Constant	0.003***	0.129***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)

Observations	37,619	37,619	37,619	37,619
Wald	925***	1,157***	1,157***	1,245***
Pseudo R-squared	0.0951	0.0948	0.118	0.119

The table reports logistic regressions predicting the likelihood of any (i.e., CAPEX, IT and R&D =1) investment disclosure relative to non-disclosure (=0). The coefficient values are reported as odds ratios, so a value>1(<1) implies that the variable increases (decreases) the 'odds' of disclosing any investment expenditure. The models are estimated on Australian listed firms over the period 1990 to 2012. All variable definitions are reported in the appendix. Post_1994_dum is a dummy variable taking a value of 1 for years 1995 to 2012, and 0 for years 1990 to 1994. Post_2003_dum is a dummy variable taking a value of 1 for years 2004 to 2012, and 0 for years 1990 to 2003. All regressions control for industry fixed effects, whose coefficients are suppressed. Time effects are captured using linear (Time) and non-linear ($Time^2$) trend variables (models 3 and 4). Standard errors are corrected for heteroskedasticity and clustering at the firm level. P-values are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4

Multinomial logistic (log-odds ratios) regressions (Hypothesis 1)

	IT	R&D	IT	R&D	IT	R&D	IT	R&D
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post_1994_dum	0.773	0.665			0.304*	0.351**		
	(0.596)	(0.335)			(0.095)	(0.047)		
Post_2003_dum			0.926	0.526*			1.051	0.554*
			(0.859)	(0.054)			(0.910)	(0.069)
Ln assets	1.117	0.987	1.116	0.988	1.117	0.993	1.116	0.991
	(0.102)	(0.814)	(0.104)	(0.817)	(0.107)	(0.902)	(0.106)	(0.872)
Cash_assets	0.472	1.146	0.469	1.192	0.450	1.104	0.453	1.193
	(0.327)	(0.803)	(0.326)	(0.743)	(0.302)	(0.854)	(0.306)	(0.741)
High_cash_dum x Low_q_dum	1.065	1.347*	1.067	1.341*	1.070	1.345*	1.067	1.347*
	(0.773)	(0.082)	(0.767)	(0.087)	(0.758)	(0.082)	(0.766)	(0.084)
High_cash_dum	1.503	1.113	1.507	1.102	1.533	1.148	1.535	1.109
	(0.224)	(0.730)	(0.225)	(0.751)	(0.207)	(0.654)	(0.207)	(0.735)
Low_q_dum	0.861	0.982	0.865	0.951	0.839	0.939	0.860	0.940
	(0.579)	(0.932)	(0.591)	(0.813)	(0.523)	(0.772)	(0.579)	(0.775)
Debt_assets	0.428	0.235**	0.427	0.240**	0.432	0.242**	0.425	0.244**
	(0.201)	(0.034)	(0.201)	(0.035)	(0.207)	(0.037)	(0.200)	(0.037)
Tobin's q	0.922	1.042	0.923	1.038	0.917	1.039	0.922	1.037
	(0.132)	(0.219)	(0.137)	(0.261)	(0.113)	(0.256)	(0.133)	(0.274)
EBITDA_assets	0.598**	0.785	0.600**	0.796	0.593**	0.773	0.596**	0.787
	(0.029)	(0.143)	(0.029)	(0.162)	(0.029)	(0.112)	(0.029)	(0.137)
DCboom	5.031***	1.078	4.825***	0.962	4.642***	1.185	4.560***	0.983
	(0.000)	(0.788)	(0.000)	(0.887)	(0.000)	(0.549)	(0.000)	(0.949)
Herfindahl index	0.735	7.624***	0.749	8.245***	0.742	8.241***	0.767	8.550***
	(0.561)	(0.000)	(0.584)	(0.000)	(0.572)	(0.000)	(0.617)	(0.000)
FDI_GDP	0.975	1.006	0.975	0.996	0.988	1.017	0.986	1.000
	(0.558)	(0.852)	(0.573)	(0.904)	(0.782)	(0.586)	(0.752)	(0.996)

S&P index	0.994	0.998	0.995	1.001	0.994	0.997	0.995	1.000
	(0.208)	(0.527)	(0.262)	(0.826)	(0.241)	(0.361)	(0.296)	(0.960)
Borrow rate	0.938	1.112	0.967	1.274**	1.051	1.093	1.013	1.234*
	(0.609)	(0.259)	(0.812)	(0.014)	(0.734)	(0.406)	(0.934)	(0.060)
Inflation	0.875	0.998	0.858	0.976	0.706**	1.044	0.772*	1.034
	(0.198)	(0.969)	(0.110)	(0.679)	(0.041)	(0.650)	(0.097)	(0.718)
GDP growth	1.037	1.009	1.017	1.041	0.860	1.034	0.903	1.097
	(0.785)	(0.914)	(0.881)	(0.655)	(0.442)	(0.783)	(0.617)	(0.465)
GDP per capita	1.000***	1.000**	1.000	1.000	1.000	1.000	1.000	1.000
	(0.006)	(0.011)	(0.112)	(0.966)	(0.449)	(0.147)	(0.852)	(0.287)
Time					1.478*	1.192	1.159	1.001
					(0.078)	(0.237)	(0.393)	(0.990)
Time^2					0.966	1.009	0.987	1.012
					(0.200)	(0.518)	(0.568)	(0.347)
Constant	0.000***	0.039*	0.000***	0.003***	0.000***	1.694	0.000***	0.128
	(0.000)	(0.077)	(0.000)	(0.003)	(0.001)	(0.899)	(0.009)	(0.620)
Observations	6,434	6,434	6,434	6,434	6,434	6,434	6,434	6,434
Wald	2,549***	2,549***	2,633***	2,633***	2,593***	2,593***	3,920***	3,920***
Pseudo R-squared	0.375	0.375	0.376	0.376	0.377	0.377	0.376	0.376

The table reports multinomial logistic regressions predicting the likelihood of IT (=1) and R&D (=2) investment disclosures relative to CAPEX (=0). The coefficient values are reported as odds ratios, so a value>1(<1) implies that the variable increases (decreases) the 'odds' of disclosing an IT or R&D investment expenditure relative to CAPEX. The models are estimated on Australian listed firms over the period 1990 to 2012. All variable definitions are reported in the appendix. Post_1994_dum is a dummy variable taking a value of 1 for years 1995 to 2012, and 0 for years 1990 to 1994. Post_2003_dum is a dummy variable taking a value of 1 for years 2004 to 2012, and 0 for years 1990 to 2003. All regressions control for industry fixed effects, whose coefficients are suppressed. Time effects are captured using linear (Time) and non-linear (Time^2) trend variables (models 5 to 8. Standard errors are corrected for heteroskedasticity and clustering at the firm level. P-values are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5: Summary statistics for cumulative abnormal returns (Hypothesis 2)

Variables	Observations	Mean	p25	p50	p75
Panel A: All disclosing firms					
3-day CAR (%)	6,437	0.215	-0.035	0.013	0.100
5-day CAR (%)	6,437	0.263	-0.040	0.016	0.117
7-day CAR (%)	6,437	0.369	-0.054	0.020	0.151
11-day CAR (%)	6,437	0.511	-0.077	0.024	0.192
Panel B: CAPEX disclosing firms					
3-day CAR (%)	5,819	0.214	-0.034	0.013	0.097
5-day CAR (%)	5,819	0.263	-0.039	0.016	0.116
7-day CAR (%)	5,819	0.366	-0.053	0.020	0.149
11-day CAR (%)	5,819	0.510	-0.074	0.024	0.190
Panel C: IT disclosing firms					
3-day CAR (%)	251	0.225	-0.061	0.010	0.129
5-day CAR (%)	251	0.275	-0.067	0.007	0.129
7-day CAR (%)	251	0.436	-0.089	0.001	0.181
11-day CAR (%)	251	0.521	-0.160	0.010	0.270
Panel D: R&D Disclosing firms					
3-day CAR (%)	367	0.220	-0.044	0.017	0.121
5-day CAR (%)	367	0.249	-0.043	0.017	0.127
7-day CAR (%)	367	0.374	-0.058	0.023	0.156
11-day CAR (%)	367	0.511	-0.095	0.014	0.206

The table reports summary statistics for percentage cumulative abnormal returns (CARs) for different investment categories over the sample period. The mean CAR is the cumulative average abnormal return (CAARs), and reflects the average cumulative abnormal return for each portfolio of investment types. Statistics are reported for firms who do not announce (i.e., non-disclosing) a 'price-sensitive' investment expenditure (Panel A), CAPEX disclosing firms (Panel B), IT disclosing firms (Panel C) and R&D disclosing firms (Panel D). All variables are defined in the appendix.

Table 6
Differences in cumulative average abnormal returns (CAARs) after SBCDP adoption

Panel A: All investment disclosures					Differences	Differences
CAARs	Pre 1994	Post 1994	Pre 2003	Post 2003	Post1994-pre	Post2003-pre
3-day CAARs (%)	0.108	0.220	0.274	0.180	0.112***	-0.094***
5-day CAARs (%)	0.181	0.267	0.333	0.221	0.086*	-0.112***
7-day CAARs (%)	0.203	0.377	0.470	0.310	0.174***	-0.159***
11-day CAARs (%)	0.374	0.517	0.637	0.436	0.143	-0.201***
Panel B: CAPEX investment disclosures						
3-day CAARs (%)	0.116	0.218	0.274	0.182	0.102***	-0.092***
5-day CAARs (%)	0.196	0.266	0.336	0.223	0.070	-0.113***
7-day CAARs (%)	0.199	0.374	0.466	0.312	0.175***	-0.154***
11-day CAARs (%)	0.380	0.516	0.638	0.441	0.136	-0.196***
Panel C: IT investment disclosures						
3-day CAARs (%)	-0.087	0.240	0.282	-0.039	0.327***	-0.322***
5-day CAARs (%)	-0.093	0.293	0.338	-0.016	0.386***	-0.354***
7-day CAARs (%)	-0.122	0.464	0.529	0.008	0.586***	-0.521***
11-day CAARs (%)	-0.192	0.557	0.639	-0.018	0.749***	-0.657
Panel C: R&D investment disclosures						
3-day CAARs (%)	0.128	0.224	0.267	0.192	0.096	-0.075
5-day CAARs (%)	0.147	0.254	0.279	0.231	0.106	-0.048
7-day CAARs (%)	0.488	0.368	0.433	0.338	-0.120	-0.095
11-day CAARs (%)	0.681	0.503	0.623	0.444	-0.178	-0.179

The table reports mean cumulative average abnormal returns (CAARs) for all investment disclosures (Panel A), CAPEX disclosures (Panel B), IT disclosures (Panel C), and R&D disclosures (Panel D) for 3, 5, 7, and 11-day windows. CAARs are defined as the mean of cumulative daily abnormal returns (CARs) calculated for each firm using different windows (3, 5, 7, and 11-days). CARs are defined as the sum of abnormal returns, where the abnormal return is calculated as the firm return less the expected return based on market model residuals, estimated from OLS regressions over a period of 200 days, starting 11-days prior to the beginning of the CAR window. *, **, *** denotes statistical significance at the 10%, 5% and 1% levels, respectively.

Table 7
CAR baseline OLS regressions

	ALL	CAPEX	IT	R&D	ALL	CAPEX	IT	R&D
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Ln assets	0.017*	0.019**	0.059	-0.119***	0.018*	0.019*	0.060	-0.121***
	(0.069)	(0.044)	(0.100)	(0.006)	(0.069)	(0.051)	(0.121)	(0.007)
Cash_assets	0.071	0.037	0.717	0.009	0.057	0.014	0.681	0.072
	(0.494)	(0.728)	(0.329)	(0.976)	(0.581)	(0.897)	(0.373)	(0.811)
High_cash_dum x Low_q_dum	-0.062**	-0.069**	-0.009	-0.075	-0.062**	-0.070**	0.018	-0.078
	(0.042)	(0.037)	(0.944)	(0.389)	(0.040)	(0.034)	(0.890)	(0.384)
High_cash_dum	-0.009	0.007	-0.268	-0.015	-0.002	0.022	-0.236	-0.043
	(0.869)	(0.896)	(0.266)	(0.923)	(0.966)	(0.686)	(0.371)	(0.781)
Low_q_dum	0.005	-0.005	0.192	0.000	-0.004	-0.017	0.207	0.014
	(0.890)	(0.900)	(0.168)	(0.997)	(0.922)	(0.672)	(0.145)	(0.901)
Debt_assets	-0.046	-0.098	0.143	0.449	-0.046	-0.086	0.148	0.480
	(0.585)	(0.239)	(0.738)	(0.322)	(0.585)	(0.300)	(0.738)	(0.308)
Tobin's q	-0.010	-0.010	0.011	-0.026	-0.011	-0.011	0.007	-0.027
	(0.207)	(0.274)	(0.666)	(0.113)	(0.182)	(0.231)	(0.787)	(0.103)
EBITDA_assets	-0.159***	-0.158***	-0.057	-0.051	-0.159***	-0.155***	-0.016	-0.058
	(0.000)	(0.000)	(0.808)	(0.613)	(0.000)	(0.000)	(0.943)	(0.580)
DCboom	-0.067	-0.081	-0.081	0.052	-0.070	-0.085	-0.258	0.070
	(0.256)	(0.223)	(0.645)	(0.806)	(0.241)	(0.203)	(0.205)	(0.747)
Herfindahl index	-0.104	-0.099		-0.148	-0.103		-0.070	-0.172
	(0.121)	(0.135)		(0.579)	(0.133)		(0.875)	(0.522)
FDI_GDP	-0.008	-0.006	-0.015	-0.029	-0.005	-0.002	-0.002	-0.033
	(0.141)	(0.278)	(0.532)	(0.137)	(0.398)	(0.699)	(0.941)	(0.100)
S&P index	0.000	0.000	-0.004	-0.002	-0.000	0.000	-0.001	-0.002
	(0.945)	(0.573)	(0.133)	(0.293)	(0.836)	(0.825)	(0.844)	(0.342)
Borrow rate	-0.016	-0.005	-0.185**	-0.068	-0.005	0.008	0.019	-0.102*

	(0.303)	(0.788)	(0.026)	(0.174)	(0.741)	(0.618)	(0.834)	(0.081)
Inflation	0.000	-0.002	-0.086	0.057*	-0.015	-0.022**	-0.409***	0.122**
	(0.967)	(0.799)	(0.191)	(0.080)	(0.184)	(0.047)	(0.003)	(0.038)
GDP growth	0.041***	0.040***	-0.102	0.013	0.011	0.003	-0.416***	0.102
	(0.002)	(0.005)	(0.238)	(0.788)	(0.529)	(0.891)	(0.000)	(0.162)
GDP per capita	-0.000***	-0.000***	-0.000	-0.000	-0.000	0.000	0.001**	-0.000
	(0.000)	(0.001)	(0.166)	(0.335)	(0.938)	(0.706)	(0.011)	(0.158)
Time					0.048***	0.054***	0.253**	-0.077
					(0.005)	(0.003)	(0.018)	(0.314)
$Time^2$					-0.002	-0.003**	-0.052***	0.012
					(0.170)	(0.049)	(0.005)	(0.138)
Constant	0.422*	0.284	1.279	3.278***	0.002	-0.384	-13.343**	6.550***
	(0.098)	(0.288)	(0.259)	(0.005)	(0.997)	(0.482)	(0.013)	(0.008)
Observations	6,434	5,817	251	366	6,434	5,817	251	366
F-statistic	4.398***	4.133***	2.363***	2.240***	4.298***	4.189***	2.860***	2.220***
Adjusted R-squared	0.030	0.029	0.133	0.142	0.032	0.031	0.147	0.150

The table reports the results of OLS baseline regressions of the cumulative abnormal returns (CARs) for each investment disclosure on specific determinants. The dependent variable is the 3-day CAR (t-1, t+1) and abnormal returns are defined using parameters estimated from OLS market models. All variables are defined in the appendix. Models 1 to 4 (5 to 8) exclude (include) controls for time effects. Models are estimated on 'All' (1 and 5) announcements, and CAPEX, IT and R*D separately. All regressions control for industry fixed effects, whose coefficients are suppressed. Time effects are captured using linear (Time) and non-linear ($Time^2$) trend variables (models 5 to 8). Standard errors are corrected for heteroskedasticity and clustering at the firm level. P-values are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively

Table 8
3-day CAR regressions and post regulation changes

	Post 1994	Post 2003	Post 1994	Post 2003
VARIABLES	(1)	(2)	(3)	(4)
Post_1994_dum x IT_dum	0.172		0.170	
	(0.147)		(0.155)	
Post_1994_dum x R&D_dum	0.086		0.088	
	(0.675)		(0.671)	
Post_1994_dum	0.330***		0.348***	
	(0.000)		(0.004)	
Post_2003_dum x IT_dum		-0.176		-0.187
		(0.128)		(0.107)
Post_2003_dum x R&D_dum		0.074		0.081
		(0.455)		(0.412)
Post_2003_dum		-0.094		-0.082
		(0.234)		(0.300)
IT_dum	-0.147	0.042	-0.145	0.047
	(0.130)	(0.601)	(0.137)	(0.559)
R&D_dum	-0.044	-0.014	-0.046	-0.016
	(0.823)	(0.882)	(0.819)	(0.865)
Ln assets	0.017*	0.017*	0.017*	0.017*
	(0.074)	(0.074)	(0.074)	(0.073)
Cash_assets	0.066	0.071	0.066	0.056
	(0.524)	(0.496)	(0.526)	(0.590)
High_cash_dum x Low_q_dum	-0.063**	-0.062**	-0.064**	-0.063**
	(0.039)	(0.040)	(0.037)	(0.038)
High_cash_dum	-0.005	-0.009	-0.005	-0.002
	(0.920)	(0.859)	(0.926)	(0.964)
Low_q_dum	0.004	0.006	0.005	-0.003
	(0.907)	(0.871)	(0.903)	(0.938)
Debt_assets	-0.038	-0.042	-0.039	-0.042
	(0.654)	(0.620)	(0.648)	(0.618)
Tobin's q	-0.009	-0.010	-0.009	-0.010
	(0.249)	(0.230)	(0.249)	(0.202)
EBITDA_assets	-0.155***	-0.155***	-0.155***	-0.155***
	(0.000)	(0.000)	(0.000)	(0.000)
DCboom	-0.100	-0.083	-0.102	-0.086
	(0.101)	(0.171)	(0.101)	(0.161)
Herfindahl index	-0.089	-0.111	-0.088	-0.110
	(0.197)	(0.103)	(0.205)	(0.112)
FDI_GDP	-0.005	-0.010*	-0.005	-0.007
	(0.377)	(0.083)	(0.366)	(0.268)
S&P index	0.000	0.000	0.000	0.000
	(0.897)	(0.490)	(0.861)	(0.693)
Borrow rate	-0.002	0.001	-0.000	0.011
	(0.884)	(0.969)	(0.991)	(0.631)

Inflation	-0.010	-0.001	-0.013	-0.017
	(0.271)	(0.934)	(0.213)	(0.126)
GDP growth	0.012	0.051***	0.008	0.018
	(0.402)	(0.001)	(0.638)	(0.343)
GDP per capita	-0.000***	-0.000	-0.000	0.000
	(0.000)	(0.516)	(0.994)	(0.733)
Time			-0.004	0.047***
			(0.864)	(0.005)
$Time^2$			-0.001	-0.003
			(0.654)	(0.117)
Constant	0.229	0.080	-0.023	-0.395
	(0.384)	(0.816)	(0.966)	(0.522)
Observations	6,434	6,434	6,434	6,434
F-statistic	4.573***	3.864***	4.369***	3.828***
Adjusted R-squared	0.034	0.031	0.034	0.032

The table reports the results of OLS regressions of the cumulative abnormal returns (CARs) for all investment disclosures post regulation dummy variables and specific determinants. The dependent variable is the 3-day CAR (t-1, t+1) and abnormal returns are defined using parameters estimated from OLS market models. All variables are defined in the appendix. Models 1 and 2 (3 and 4) exclude (include) controls for time effects. Model 1 and 3 include a post 1994 regulation dummy (Post_1994_dum) variable taking a value of 1 for years 1995 to 2012, and 0 for years 1990 to 1994. Post_2003_dum (models 2 and 4) is a dummy variable taking a value of 1 for years 2004 to 2012, and 0 for years 1990 to 2003. To test if CARs are significantly different between R&D and IT disclosures compared to CAPEX post regulation change interaction terms are used. All regressions control for industry fixed effects, whose coefficients are suppressed. Time effects are captured using linear (Time) and non-linear ($Time^2$) trend variables (models 3 to 4). Standard errors are corrected for heteroskedasticity and clustering at the firm level. P-values are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9
11-day CAR regressions and post regulation changes

Variables	Post 1994 (1)	Post 2003 (2)	Post 1994 (3)	Post 2003 (4)
Post_1994_dum x IT_dum	0.327		0.325	
	(0.146)		(0.150)	
Post_1994_dum x R&D_dum	-0.187		-0.184	
	(0.672)		(0.675)	
Post_1994_dum	0.734***		0.777***	
	(0.000)		(0.002)	
Post_2003_dum x IT_dum		-0.365*		-0.388*
		(0.091)		(0.073)
Post_2003_dumr x R&D_dum		0.037		0.053
		(0.861)		(0.803)
Post_2003_dum		-0.055		-0.022
		(0.727)		(0.889)
IT_dum	-0.259	0.108	-0.257	0.119
	(0.153)	(0.504)	(0.157)	(0.460)
R&D_dum	0.333	0.124	0.331	0.118
	(0.448)	(0.554)	(0.449)	(0.574)
Ln assets	0.042**	0.042**	0.042**	0.043**
	(0.034)	(0.033)	(0.033)	(0.032)
Cash_assets	0.266	0.270	0.267	0.240
	(0.200)	(0.193)	(0.196)	(0.246)
High_cash_dum x Low_q_dum	-0.127**	-0.126**	-0.127**	-0.126**
	(0.036)	(0.037)	(0.034)	(0.036)
High_cash_dum	-0.017	-0.022	-0.017	-0.008
	(0.879)	(0.839)	(0.876)	(0.938)
Low_q_dum	-0.032	-0.031	-0.030	-0.050
	(0.680)	(0.683)	(0.698)	(0.516)
Debt_assets	-0.138	-0.144	-0.138	-0.143
	(0.430)	(0.407)	(0.428)	(0.410)
Tobin's q	-0.023	-0.025	-0.023	-0.026*
	(0.129)	(0.100)	(0.131)	(0.085)
EBITDA_assets	-0.285***	-0.288***	-0.284***	-0.288***
	(0.000)	(0.000)	(0.000)	(0.000)
DCboom	-0.251**	-0.201*	-0.255**	-0.205*
	(0.029)	(0.081)	(0.029)	(0.078)
Herfindahl index	-0.253*	-0.298**	-0.251*	-0.296**
	(0.068)	(0.028)	(0.072)	(0.032)
FDI_GDP	0.002	-0.007	0.001	0.001
	(0.876)	(0.536)	(0.925)	(0.939)
S&P index	0.001	0.001	0.001	0.001
	(0.411)	(0.381)	(0.387)	(0.608)
Borrow rate	0.006	-0.013	0.008	0.003
	(0.843)	(0.752)	(0.799)	(0.943)

Inflation	-0.024	-0.003	-0.027	-0.031
	(0.181)	(0.856)	(0.268)	(0.211)
GDP growth	-0.005	0.065*	-0.006	0.002
	(0.879)	(0.074)	(0.872)	(0.968)
GDP per capita	-0.000***	-0.000	-0.000	-0.000
	(0.000)	(0.134)	(0.809)	(0.825)
Time			-0.013	0.101***
			(0.795)	(0.003)
$Time^2$			-0.001	-0.004
			(0.874)	(0.261)
Constant	0.242	0.441	-0.028	-0.120
	(0.655)	(0.512)	(0.982)	(0.927)
Observations	6,434	6,434	6,434	6,434
F-statistic	5.232***	3.871***	4.943***	3.839***
Adjusted R-squared	0.036	0.032	0.036	0.033

The table reports the results of OLS regressions of the cumulative abnormal returns (CARs) for all investment disclosures post regulation dummy variables and specific determinants. The dependent variable is the 11-day CAR (t-5, t+5) and abnormal returns are defined using parameters estimated from OLS market models. All variables are defined in the appendix. Models 1 and 2 (3 and 4) exclude (include) controls for time effects. Model 1 and 3 include a post 1994 regulation dummy (Post_1994_dum) variable taking a value of 1 for years 1995 to 2012, and 0 for years 1990 to 1994. Post_2003_dum (models 2 and 4) is a dummy variable taking a value of 1 for years 2004 to 2012, and 0 for years 1990 to 2003. To test if CARs are significantly different between R&D and IT disclosures compared to CAPEX post regulation change interaction terms are used. All regressions control for industry fixed effects, whose coefficients are suppressed. Time effects are captured using linear (Time) and non-linear ($Time^2$) trend variables (models 3 to 4). Standard errors are corrected for heteroskedasticity and clustering at the firm level. P-values are reported in parentheses. ***, **, * denotes statistical significance at the 1%, 5%, and 10% levels, respectively.