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The Impact of Statutory Sanctions on the Level and Information Content of Voluntary Corporate Disclosure

This article examines the effect of statutory civil and criminal sanctions on voluntary corporate disclosures by firms listed on the Australian Stock Exchange (ASX). Apart from direct investigation of the quantity of voluntary disclosure, we also investigate several possible consequences of altered corporate disclosure policies, namely properties of analysts' forecasts, the degree to which share prices anticipate the information content of periodic earnings reports, and the relationship between volatility and corporate disclosures. Results suggest that, post-sanctions, any increase in voluntary disclosure is confined to smaller firms and those which performed relatively poorly. Moreover, analysts' earnings forecasts did not become more accurate or less diverse following the introduction of statutory sanctions, and there was no statistically significant increase in the weight placed on each disclosure's ability to explain return volatility. There is some evidence that share prices have anticipated earlier the value relevant components of annual periodic accounting data, although this result is again confined to smaller firms. Although the tests used are not independent and have a limited time period post-sanctions, the results cast doubt on the extent to which the imposition of substantive civil or criminal sanctions affects corporate disclosure policy.

Key words: Disclosure; Information; Sanctions.

This paper investigates the impact of significant statutory civil and criminal sanctions on both the quantity and timeliness of voluntary disclosures made by firms listed on the Australian Stock Exchange (ASX).[1] Following a number of high profile corporate failures during the latter half of the 1980s, and prosecutions which followed,

[1] These changes were enacted via the *Corporations Law Reform Act 1994* (Cth), and became effective on 5 September 1994.

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considerable criticism was levelled at the quality and frequency of Australian corporate reporting,[2] especially the way in which the ASX enforced listing rules relating to the maintenance of an informed market.[3] Reviewing events leading up to the legislative action, Brown *et al.* (1998) argue that the process which followed these criticisms was, in many respects, consistent with Peltzman's (1976) description of the political process, whereby legislative action is provoked by an alleged 'crisis'. In this case, the alleged crisis was a lack of confidence in the timeliness of corporate reporting, leading to demands for legislative intervention. In its final form, the legislation focused on the extent to which statutory sanctions could provide support for existing disclosure requirements (i.e., the introduction of substantial civil and criminal penalties). This received bipartisan political support, as well as the endorsement of the Australian Securities Commission (ASC, now Australian Securities and Investment Commission) and the ASX.[4] However, given relatively

[2] Typical of these criticisms is the testimony before the House of Representatives Standing Committee on Legal and Constitutional Affairs (the Lavarch Committee) offered by a senior investment banker who stated:

> The lack of meaningful disclosure has enabled the management of certain companies to undertake transactions that have caused a significant transfer of wealth from shareholders to management and selected large shareholders associated with management . . . During this process shareholders have had limited opportunity to intervene and question . . . the motives of the directors of companies in which they own shares.

The investment banker argued that disclosure by listed firms was lacking in both detail and timeliness, a view supported by several other witnesses appearing before this enquiry. (Evidence presented by Mr M. McComas, Director, County NatWest Australian Corporate Services Ltd, 3 September 1990.)

[3] Prior to 1992, ASX Listing Rule 3A(1) required companies to notify the exchange 'immediately' of any information about their activities likely to have a material effect on share price, or to avoid the creation of a false market in their shares. This requirement was amended to coincide with the requirements of s. 1022 of the *Corporations Law* dealing with information required in prospectuses, so that under 3A(1) firms were required to reveal information which:

> investors and their professional advisers would reasonably require, and reasonably expect to be disclosed to the market, for the purpose of making an informed assessment of:
>
> (a) the assets and liabilities, financial position, profits and losses, and prospects of the listed company; and
> (b) the rights attaching to securities of the listed company.

[4] In conjunction with the legislation, Listing Rule 3A(1) was again amended, presumably to clarify listed entities' obligations in light of the introduction of statutory civil and criminal penalties. The revised version of 3A(1) operative from September 5, 1994 states:

> A listed company shall immediately notify the Exchange of any information concerning the company of which it is or becomes aware and which a reasonable person would expect to have a material effect on the price or value of securities of the company. This requirement does not apply if each of the following conditions is and remains satisfied:
>
> (i) a reasonable person would not expect the information to be disclosed; and
> (ii) the information is confidential; and
> (iii) one or more of the following conditions apply:
>
> (a) it would be a breach of a law to disclose the information;
> (b) the information is, or is part of, an incomplete proposal or negotiation;
> (c) the information comprises matters of supposition or is insufficiently definite to warrant disclosure;

constant requirements for timely disclosure by ASX-listed firms, the assumption accepted by all these groups was that the statutory imposition of substantial civil and criminal penalties would result in significant changes in corporate disclosure policies, especially in respect of voluntary disclosures.[5] Put simply, the legislation which took effect from 5 September 1994 was intended to enhance the 'enforceability' of existing ASX disclosure rules.[6]

The extent to which corporate disclosures can be influenced by the threat of civil and criminal penalties has been debated extensively (Friend, 1976). For example, Stigler (1964) compares the post-listing performance of United States equity issues before and after the Securities Exchange Commission (SEC) was given control over the registration of new issues (via the *Securities and Exchange Act, 1934*). Although Stigler concludes the legislation was ineffective, his empirical method is relatively naive, requiring an assumption that market-adjusted post-listing stock returns have no 'time-specific' elements, and can be compared purely on the basis of a legislative intervention date (Friend, 1976). Benston's (1973) investigation of 'disclosure improvements' following the 1934 *Securities and Exchange Act* also relies on the critical assumption that a proxy for the extent of corporate disclosure (i.e., price volatility) is otherwise temporally constant.

Investigation of the effect of statutory civil and criminal sanctions on ASX-listed firms' disclosures also needs to make temporal comparisons across a common intervention date. Methods employed in this research typically involve the use of several 'controls' absent in early United States-based studies such as Stigler (1964) and Benston (1973), as well as utilizing a variety of (non-independent) proxies for the effect of any change in disclosure timeliness. Apart from measures of the quantity of voluntary disclosure made by ASX-listed firms, we also investigate post-sanctions changes in each of the following indicators; attributes of analysts' earnings forecasts, share price anticipation of periodic earnings reports, and the relationship between corporate disclosures and price volatility.

The initial focus on voluntary disclosures differs from much of the extant literature. Rather than modelling the cross-sectional determinants of a single disclosure type (e.g., earnings forecasts), we try to capture the total extent of voluntary disclosures, using one of two proxy measures. These are the number of disclosures flagged as price sensitive by the ASX, and the number of disclosures assigned an

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(d) the information is generated for the internal management purpose of the company; or
(e) the information is a trade secret.

For the purpose of this listing rule, the company becomes aware of information where a director or executive officer has, or ought reasonably to have, come into possession of the information in the course of the performance of duties as a director or executive officer.

[5] The term 'voluntary disclosure' is used to describe those disclosures made to comply with ASX Listing Rule 3A(1). In the same manner as Frost (1997), we argue that disclosures made to comply with 3A(1) are also often described as voluntary, while determining whether information is price sensitive (and hence subject to 3A(1)) is judgmental, resulting in such disclosures being effectively discretionary.

[6] Specifically, these changes are contained in s. 1001A of the *Corporations Law*.

ASX code consistent with them being 'non-routine'. Irrespective of the proxy used, the results suggest that any increase in voluntary disclosure is confined to relatively small firms, and those that performed relatively poorly.

Likewise, tests which focus on the consequences of an increase in timely voluntary disclosure also fail to yield results consistently supportive of statutory sanctions having significantly affected corporate disclosure policies. After controlling for firm and time specific influences, analysts' forecasts of net profit after tax are more (rather than less) biased, less (rather than more) accurate, and no less dispersed following the introduction of statutory sanctions. These results do no support the claim that the imposition of substantial statutory civil and criminal penalties affected the timeliness of voluntary disclosures by ASX-listed firms. In contrast, there is some evidence that post-sanctions stock prices show relatively earlier anticipation of earnings results. Using an approach similar to Ball and Brown (1968), it appears that the value-relevant component of the preliminary final statement is anticipated earlier, although this effect is confined to smaller firms, which are less likely to have significant institutional shareholders or analyst following. However, when the relation between monthly stock price volatility and disclosures designated by the ASX as 'price sensitive' is examined, there is no evidence of a statistically significant change in the strength of this relationship.

Overall, our results are best described as mixed, although the short time period since the introduction of statutory sanctions may be insufficient to observe any significant impact. It is also important to recognize that our four basic types of test involve overlapping time periods and sample firms, and therefore cannot be viewed as independent tests of any relationship between the imposition of substantial statutory civil and criminal sanctions and the extent of timely, voluntary disclosure. Subject to these limitations, the results at least cast doubt on the extent to which variation in the quantity and timeliness of corporate disclosure is significantly related to enforcement mechanisms directed at the flow of irregular information. Variations in economic incentives (including 'cultural' factors) may be substantially more important determinants of voluntary corporate disclosure than variations in regulatory or enforcement procedures and penalties.

HYPOTHESES

Voluntary Disclosures

The primary hypothesis addresses whether substantive statutory civil and criminal sanctions have a significant impact on the frequency of voluntary disclosure. However, tests of this hypothesis require adequate controls for 'other' influences on disclosure policy, which may not be constant across the period we examine. Models of voluntary disclosure policy typically assume that disclosure of information is costly, recognizing that possible 'frictions' result in conflicting incentives to disclose. For example, Verrecchia (1983) shows that managers will exercise discretion in disclosing or withholding information about firm value, reflecting 'proprietary' disclosure costs.[7]

[7] Extensions of this approach include Darrough and Stoughton (1990) and Verrecchia (1990).

Empirical evidence also supports the proposition that firms face potentially conflicting incentives in deciding whether voluntarily to disclose some information. On the one hand, firms can reduce the cost of capital by increasing their level of disclosure, especially forward-looking information (Healy *et al.*, 1995; Botosan, 1997). However, product market considerations may discourage disclosure, and support for this view is provided by Lee *et al.* (1995) and Clarkson *et al.* (1994). Recognition of these potentially conflicting incentives yields two important lessons. First, one would not expect to observe all firms following the same disclosure policies. Second, tests of temporal differences in disclosure need to control for both firm specific and broader economic influences such as variations in the level of capital market activity.

Our interest in the distinguishing characteristics of firms which voluntarily disclose information is analogous to Ruland *et al.* (1990), who examine characteristics of listed U.S. firms making earnings forecasts. They argue that management possession of good news, variations between analyst and management expectations (i.e., correction or confirmation), new capital offerings and the level of 'inside' ownership will differ systematically between forecasters and other firms. With the exception of the good news hypothesis, Ruland *et al.* find results consistent with their hypotheses. However, unlike Ruland *et al.*, the focus here is on a measure of total voluntary disclosure, rather than a single type of voluntary disclosure such as an earnings forecast. While Lang and Lundholm (1993) examine a number of characteristics associated with differential disclosure, their measure of 'comprehensive disclosure' is as assessed by financial analysts. Hence they do not model disclosure *per se*, but rather analysts' perceptions of disclosure. They find that disclosure is an increasing function of past, current and future performance, consistent with the good news hypothesis. They also find that disclosure ratings increase with firm size and the issuance (or pending issuance) of securities, and decrease with the volatility of prior periods' performance. Consistent with Ruland *et al.* (1990) and Lang and Lundholm (1993), other studies also find evidence of planned capital raisings influencing disclosure policy (Clarkson *et al.*, 1994; Frankel *et al.*, 1995; Healy *et al.*, 1995).

In summary, the theory and evidence on voluntary disclosure suggest that disclosure is associated with firm size (large firms disclose more information), whether the firm has good news or bad news to report (disclosure is positively related to the presence of good news), whether the firm is engaged in an equity issue (more information is disclosed around the time of an equity issue) and whether the firm has analysts' earnings forecasts (firms with an established analyst following are expected to disclose more information). Also, controls are used for the firm's industry because ASX listing requirements result in more frequent reports for some industries. For example, mining and exploration companies must file a quarterly activity report. Banking and finance companies have different regulatory regimes and very different capital structures, and investment companies are presumably driven more by market-wide events than are other companies. Another reason for controlling for industry is that many 'other factors' cluster by industry, and a simple industry dummy variable can serve as a 'fixed effects' control for these factors. In seeking to

control for the known determinants of voluntary disclosure, the following multiple regression model is employed:

$$\begin{aligned} NUMDOCS = {} & \alpha_0 + \alpha_1 SANDUM + \alpha_2 SIZE + \alpha_3 INDDUM1\text{–}5 + \\ & \alpha_4 INDDUM16\text{–}19 + \alpha_5 INDDUM20 + \alpha_6 ISSUEDUM + \\ & \alpha_7 NEWSDUM + \alpha_8 BARDUM + \varepsilon \end{aligned} \quad (1)$$

where:

NUMDOCS = a measure of the extent of voluntary disclosure by firm i in period k, where k is either the pre-sanctions period or the post-sanctions period;

SANDUM = a dummy variable that takes the value 0 if the observation is drawn from the pre-sanctions period, and 1 for the post-sanctions period;

SIZE = the natural logarithm of the firm's total market capitalization, at August 1992 if the observation is drawn from the pre-sanctions period, and at August 1994 for the post-sanctions period;

INDDUM1–5 = an industry dummy variable that takes the value 1 if the firm is in industry group 1 to 5, and 0 otherwise;

INDDUM16–19 = an industry dummy variable that takes the value 1 if the firm is in industry group 16 to 19, and 0 otherwise;

INDDUM20 = an industry dummy variable that takes the value 1 if the firm is in industry 20, and 0 otherwise;

ISSUEDUM = a new issue dummy variable which takes the value 1 if the firm made a rights issue in the period, and 0 otherwise;

NEWSDUM = a dummy variable which takes the value 0 if the firm had 'bad' news in the period, and 1 otherwise. Good news is measured as the market-adjusted cumulative return for the firm pre- or post-statutory sanctions. If this market adjusted return (CAR) is positive, the firm is classified as having generally revealed good news; and

BARDUM = a dummy variable which takes the value 1 if the firm is included in the BARCEP survey of analysts' earnings forecasts, and 0 otherwise.

Properties of Analysts' Forecasts

Although tests of the primary hypothesis control for several documented determinants of corporate disclosure policy, such models remain relatively ad hoc. Moreover, 'direct' tests of voluntary disclosure decisions do not capture the effect of such decisions. Hence, consideration is given to indicators of the extent to which statutory sanctions may have resulted in more timely voluntary disclosures. Analysts' forecasts are one such indicator, and have been widely used as a proxy for investor beliefs (Abarbanell *et al.*, 1995). Our tests are based on the idea that more timely disclosures will improve forecast accuracy and reduce analyst disagreement. However, while there is a very large literature on the accuracy of analysts'

forecasts and the determinants of analysts' disagreement, there is less evidence on the relationship between corporate disclosure policy and the properties of analysts' forecasts.[8]

Detailed evidence on the relationship between corporate disclosure policy and analysts' forecast properties is provided by Lang and Lundholm (1996).[9] They argue that the effect of additional or more timely disclosure on the dispersion of analysts' forecasts depends on whether they have a common forecasting model and the extent to which their forecast information differs. If analysts have common firm-provided and private information, but place differing weights on information from each source, then additional disclosure will increase the dispersion in analysts' forecasts. However, Lang and Lundholm show that analysts' forecasts become less diverse as firms increase their disclosure (as measured by analyst rankings), consistent with the hypothesis that increased disclosure should result in less (rather than more) dispersion in analysts' forecasts. Provided also that information distributed by sell-side security analysts is not a substitute for enhanced corporate disclosure, it is expected that, post-sanctions, analysts' forecasts should become less biased, more accurate and less dispersed.

Once again, hypothesis testing based on temporal intervention requires the use of sufficient control variables. Consistent with the existing literature (Brown, 1994), the accuracy and consensus of forecasts are expected to increase with the extent of analyst following. Accordingly a control for analyst following is included. There is also a control for firm size, because larger firms should have forecasts that are more accurate and have greater consensus. Shares with higher volatility indicate greater uncertainty in the market about that stock, which implies less accurate forecasts and greater analyst disagreement. This suggests a need to control for volatility. The accuracy of last year's forecast is also included, because we expect this year's forecast to be more accurate and have greater consensus among analysts if last year's was more accurate. Also, the opportunity to short a stock when adverse information is uncovered increases analysts' incentives to collect information and can result in more accurate forecasts and greater agreement among them. Controls for whether the stock has options traded and whether it can be short sold are also included. Industry effects can play a part because the earnings of companies in some industries are easier to forecast than others, for reasons including differences in product maturity, and operating and financial leverage. Finally, in tests of forecast accuracy or bias, a control for analyst disagreement is incorporated, because analysts disagree more when there is greater uncertainty, which implies that their consensus forecasts are then likely to be less accurate.[10] Hence, the following models are tested:

[8] A small number of studies examine the relationship between properties of analysts' forecasts and management's earnings forecasts (e.g., Waymire, 1986; Jennings, 1987; Baginski and Hassell, 1990).

[9] Lang and Lundholm (1996) also investigate the relationship between corporate disclosure policy and the extent of analyst following.

[10] That is, analyst disagreement is used as an explanatory variable when we are predicting forecast accuracy, but not vice versa as forecast accuracy is unknown when the forecast is made.

$$ERROR = \beta_0 + \beta_1 PERIOD + \beta_2 NUMAN + \beta_3 DISAN + \beta_4 SIZE + \beta_5 PREVERROR + \beta_6 PREVABSERR + \beta_7 VOL + \beta_8 INDDUM1\text{–}5 + \beta_9 INDDUM16\text{–}19 + \beta_{10} INDDUM20 + \beta_{11} OPTIONS + \beta_{12} SHORT + \beta_{13} SANDUM1 + \beta_{14} SANDUM2 + \varepsilon \quad (2a)$$

$$DISAN = \beta_0 + \beta_1 PERIOD + \beta_2 NUMAN + \beta_3 SIZE + \beta_4 PREVERROR + \beta_5 PREVABSERR + \beta_6 VOL + \beta_7 INDDUM1\text{–}5 + \beta_8 INDDUM16\text{–}19 + \beta_9 INDDUM20 + \beta_{10} OPTIONS + \beta_{11} SHORT + \beta_{12} SANDUM1 + \beta_{13} SANDUM2 + \varepsilon \quad (2b)$$

where: ERROR = a measure of the error in the consensus analysts' forecast for firm i in period k, as recorded by BARCEP;

PERIOD = the number of months from the forecast date until the month in which the company files its preliminary final statement with the ASX;

NUMAN = the number of separate analyst forecasts contributed to BARCEP;

DISAN = the standard deviation across analysts' forecasts of net profit after tax for firm i in a given month;

SIZE = the natural logarithm of the firm's market capitalization (in $ millions);

PREVERROR = last year's forecast error, measured at the corresponding month in the previous year;

PREVABSERR = the absolute value of last year's forecast error, measured at the corresponding month in the previous year;

VOL = the variance of the monthly rate of return on the firm's shares.

INDDUM1–5 = an industry dummy variable that takes the value 1 if the firm is in ASX industry group 1–5, and 0 otherwise;

INDDUM16–19 = an industry dummy variable that takes the value 1 if the firm is in ASX industry group 16–19, and 0 otherwise;

INDDUM20 = an industry dummy variable that takes the value 1 if the firm is in ASX industry group 20, and 0 otherwise.

OPTIONS = a dummy variable that takes the value 1 if the firm has ASX traded options in the same period;

SHORT = a dummy variable that takes the value 1 if the firm is approved by the ASX for short-selling;

SANDUM1 = a dummy variable that takes the value of 1 if the fiscal year straddles the introduction of statutory sanctions (i.e., years which end between July 1994 and May 1995), and 0 otherwise; and

SANDUM2 = a dummy variable that takes the value of 1 if the fiscal year ends June 1995 or later.

Stock Prices and Disclosure

The relationship between stock price movements and periodic earnings releases has been extensively documented (Brown, 1994) and it is well accepted that these statutory reports are anticipated (i.e., much of the related stock price movement occurs prior to the report's release). Because variations in corporate disclosure may be evident in the behaviour of stock prices, attention is directed to the relationship between share prices and periodic accounting reports as well as the relationship between volatility and information releases. If firms voluntarily disclose information in a more timely fashion, then stock prices will show relatively earlier anticipation of the information contained in periodic accounting reports. In addition, post-sanctions, corporate disclosures designated as 'price-sensitive' by the ASX should be more closely associated with variations in stock price volatility.

It is difficult to measure the nature of the news in a financial statement as complex as a half yearly report (HYR) or a preliminary final statement (PFS). The view taken here is that, embedded somewhere in the financial statements, is all the information released to the market since the date of the previous report.[11] That is, we take the value-relevance of the firm-specific information contained in a financial statement to be accurately measured by the market-adjusted price movement in the period leading up to the report's announcement.[12] For HYRs, price movements are analysed over the six months to the report's announcement, and for PFSs, price movements over twelve months. The conjecture is that if statutory civil and legal sanctions lead to earlier disclosures of price-sensitive information, then that information would have been reflected in share prices earlier.

For tests of the relationship between stock price volatility and corporate disclosure, there is once again difficulty in controlling for 'other effects'. The approach taken is to control for variations in market volatility, as well as the number of price-sensitive disclosures, with the expectation that an interaction effect (i.e., the product of a post-sanctions dummy and the quantity of disclosure) should be significantly positive. Hence, the following model is tested:

$$VOL = \gamma_0 + \gamma_1 NUMDOCS + \gamma_2 ASX + \gamma_3 MSCI + \gamma_4 SP + \gamma_5 SANDUM + \gamma_6 NUMDOCS.SANDUM \quad (3)$$

where: VOL = a measure of monthly price volatility,
NUMDOCS = the number of disclosures in a given month flagged as price sensitive by the ASX,
ASX = the absolute value of the monthly rate of return on the ASX All Ordinaries Accumulation Index,

[11] This view, commonly used in capital markets research in accounting, dates from the earliest studies (e.g., Ball and Brown, 1968). They showed that the earnings figure alone accounts for half the value of all information that comes to the market annually.

[12] A similar approach is used by Alford *et al.* (1993) to compare the information content of periodic accounting reports across several countries.

MSCI = the absolute value of the monthly rate of return on the Morgan Stanley Capital International World Index,

SP = the absolute value of the monthly rate of return on the S and P 500 Index, and

SANDUM = a fixed-effects dummy variable equal to 1 if the measure of volatility (VOL) is for a post-sanctions month, otherwise zero.

DATA

Our initial data set comprises the complete set of announcements made by ASX-listed firms through Signal G electronic records, provided by Securities Industry Research Centre of Asia-Pacific (SIRCA). SIRCA has been receiving Signal G data, which contain the full electronic text of announcements made by Stock Exchange Automated Trading System (SEATS) listed firms, since 29 August 1992 through to our cut-off date of 31 March 1996.[13] While there were 1,474 firms listed on the ASX at some time during this period, our tests require the availability of monthly trading data. This requirement reduces our sample size for disclosure tests to 463 firms which survived for the entire period and which traded at least once in each month.

The extent of voluntary disclosure is measured in two ways, both of which are simple document counts. First, we count the number of disclosures labelled by ASX staff as price sensitive.[14] While this includes regular reports, based on discussions with ASX staff, this is presumed to include any material, voluntary disclosures which would normally be flagged as price sensitive. Second, we count disclosures within the two-digit category most likely to capture irregular disclosure. While the ASX attaches two-digit event codes to all Signal G transmissions, our focus is on item 14 ('Other') announcements.[15]

Analysts' consensus forecasts, the standard deviation across analysts' forecasts, the number of analysts who contributed net profit after tax (NPAT) forecasts, actual NPAT and the announcement month were all extracted from the monthly BARCEP publication. NPAT, as defined by BARCEP, is before extraordinary

[13] There are some instances where Signal G records are missing from SIRCA's database. Data for 30 November 1993, 20 December 1993 and the period from 13 January 1994 to 20 January 1994 are missing. It is unlikely that these missing observations would substantially alter our results and conclusions.

[14] A summary of the ASX's procedures in transmitting announcements is available from the authors.

[15] These two-digit codes are a standardized classification system for all announcements. Some announcements have more than one code, as releases often contain information on several different topics. For example, the PFS is normally assigned a 03 code (Periodic Reports), a 08 code (Notice of Meeting) and a 10 code (Dividend Announcement). The reliability of these electronic records was tested for a stratified random selection of small, medium and large firms (thirty in total) by comparing the electronic records with the hard copy documents held in the ASX Collection at the University of Sydney. In general, we find the electronic records to be both accurate and complete. Full details of these tests are available from the authors.

and abnormal items and after tax and preference dividends. The pre-sanctions sample is drawn from financial years ending between August 1992 and June 1994 and the post-sanctions sample from financial years ending between June 1995 and December 1995. For consistency reasons BARCEP-reported NPAT actuals are also used (Philbrick and Ricks, 1991). We are able to identify ninety-two firms which are within our initial sample described above and which also are covered by BARCEP. Market capitalization data were supplied by the ASX for all index stocks beginning December 1989 and for all listed stocks for the period July 1995 to March 1996. Gaps in the market capitalization data sourced from the ASX were filled using data extracted from the ASX's Statex database on-line at the University of Western Australia. Return volatility was measured by the monthly discrete return variance over the period January 1992 to March 1996, estimated using last-trade-for-the-month prices and dilution factors supplied by SIRCA. Industry numbers were supplied by the ASX. Stocks with put or call options traded on the ASX were identified from newspapers, and stocks eligible for short selling were identified from the daily share quotation sheets published by the ASX. The release date for the HYR and PFS are identified from Signal G. Because the minimum monthly price and trading period requirement is shorter than for our tests of disclosure quantity, our sample size is accordingly larger, with a maximum sample size (post-sanctions) of 737 firms.

For tests which use price volatility as the dependent variable (i.e., tests of equation (3)), firms were required to have at least twelve monthly returns between January 1992 and August 1994 (pre-sanctions) and another twelve between September 1994 and March 1996 (post-sanctions). There are 727 ASX-listed firms which satisfied this requirement.

EVIDENCE OF CORPORATE DISCLOSURES

Total Disclosures

Table 1 contains preliminary descriptive results for the frequency counts of documents disclosed to the ASX. It contains two sets of results. Panel A summarizes disclosures made by the 1,474 firms, split by ASX two-digit reporting code, for the pre-sanctions and post-sanctions periods. It is a simple count of all documents released by all firms for which we have electronic records.[16] The pre-sanctions period in Panel A is defined as 29 August 1992 to 4 September 1994 (approximately twenty-four months), while the post-sanctions period is from 5 September 1994 to 31 March 1996 (approximately nineteen months). Despite having a shorter post-sanctions observation period, there is a substantial increase in total disclosures. The pre-sanctions total document count is 52,741, while post-sanctions it is 77,723. However, there is a substantial decrease in the number and frequency of code 14 'Other' reports (i.e., one of our proxies for the quantity of voluntary disclosure).

[16] Because a single document can contain several different ASX announcement codes, Table 1 reports a count of total ASX codes, rather than documents.

TABLE 1

Pre-sanctions period and post-sanctions period document count split by ASX report code for all 1,474 ASX-listed-firms (Panel A), and for the standardized pre-sanctions period (5 September 1992 to 31 March 1993 and 5 September 1993 to 4 September 1994) and post-sanctions period (5 September 1994 to 31 March 1996) split by price-sensitive and non price-sensitive documents (Panel B)

ASX report code	Pre-sanctions count	Pre-sanctions %	Post-sanctions count	Post-sanctions %
Panel A				
01 Takeover announcements	822	2	1,856	2
02 Shareholder details	8,011	15	14,290	18
03 Periodic reports	6,932	13	16,831	22
04 Quarterly activities report	2,273	4	2,597	3
05 Quarterly cash flow report	1,660	3	1,824	2
06 Issued capital	1,603	3	4,254	5
07 Asset acquisition and disposal	730	2	1,614	2
08 Notice of meeting	4,259	8	5,866	8
09 Stock exchange announcement	839	2	1,002	1
10 Dividend announcement	1,454	3	3,187	4
11 Progress report	2,898	5	4,483	6
12 Company administration	3,142	6	3,312	4
13 Notice of call (contributing shares)	4	0	27	0
14 Other	18,114	34	15,252	20
15 Chairman's address	0		455	1
16 Letter to shareholders	0		419	1
17 ASX query	0		415	1
18 Warrants	0		39	0
Total Documents	52,741	100	77,723	100
Panel B				
Total documents for standardized period	48,091	100	63,235	100
Price-sensitive documents	14,687	30	17,596	28
Not price-sensitive	33,404	70	45,639	72

Panel B of Table 1 controls for seasonal patterns in reporting by ASX firms by standardizing the period for our document count. The pre-sanctions period is defined as 5 September 1992 to 31 March 1993 and 5 September 1993 to 4 September 1994 (a total of approximately nineteen months) and the post-sanctions period as 5 September 1994 to 31 March 1996 (again, approximately nineteen months). In defining periods this way maximum use is made of available post-sanctions observations, subject to the seasonality constraint. Panel B results show that the introduction of statutory sanctions was associated with a substantial increase in

total documents, rising from 48,091 to 63,235. However, the post-sanctions increase in price-sensitive documents (our second proxy for total voluntary disclosures) is relatively low compared to non price-sensitive documents.

Determinants of Disclosure

Table 2 contains the results of our tests of equation (1). Results are reported using two definitions of NUMDOCS. First, NUMDOCS is defined as all disclosures flagged as potentially 'price sensitive' by the ASX. Alternatively, exclusive focus is on item 14 ('Other') disclosures, which are most likely to be disclosures made voluntarily. We also report two modifications of equation (1), first by excluding firms with an analyst following (as indicated by their inclusion in BARCEP reports), and second, by excluding firms classified as having released predominantly good news. Because firms included in BARCEP must have an analyst following, these firms are likely to voluntarily provide more financial as well as non-financial information. Accordingly, the introduction of statutory sanctions may have less impact on these firms' voluntary disclosures. For United States firms, Lang and Lundholm (1996) show that 'more informative' disclosure policies result in a larger analyst following, consistent with the view that firms use voluntary disclosure as a means of generating analyst following, and ultimately reducing their cost of capital.

Statutory sanctions may also differentially impact on firms depending on whether they possess good or bad news. Although there is some theoretical and empirical evidence suggesting that good news is more likely to be voluntarily disclosed, Skinner (1994, 1997) presents evidence that, among United States firms, bad earnings news is more likely to be pre-empted than good earnings news, and that this pre-emption reduces the expected costs of shareholder litigation. Although shareholder litigation costs are probably lower in Australia than in the United States, the introduction of statutory civil and criminal sanctions may have a greater impact on irregular disclosure of bad news *vis-à-vis* good news. Brown *et al.* (1998) argue that the introduction of statutory sanctions was largely motivated by political concern that listed firms were not sufficiently forthcoming with bad news.

Table 2 shows that, as expected, the number of documents disclosed is positively and significantly related to the size of the firm, the mining industry dummy (Industry 1 to 5) and whether the firm is included in the BARCEP survey.[17] When NUMDOCS is defined as the number of ASX-designated price-sensitive documents, there is a significant, positive equity issue coefficient. Of central interest to our test is the statutory sanctions dummy variable. The estimated coefficient in the regression using the price-sensitive disclosures is insignificant. It is, however, positive, suggesting an insignificant increase of 0.78 documents per firm in the period following the introduction of statutory sanctions relative to the earlier period. It is significantly negative for the 'Other' disclosures, with an estimated 7.6 fewer disclosures per company.

[17] Our approach assumes that the coefficients γ_2 through γ_8 are stable over time. A substantial drift in some or all of these coefficients may affect the significance of the SANDUM coefficient. However, the relatively high explanatory power of the model reduces the likelihood that this can occur.

TABLE 2

Multiple regression disclosure model where the dependent variable is a measure of voluntary disclosure by the 463 ASX listed firms which survived and traded in each month in both the pre-sanctions period (5 September 1992 to 31 March 1993 and 5 September 1993 to 4 September 1994) and the post-sanctions period (5 September 1994 to 31 March 1996). Each firm has two observations in the regression, one being the pre-sanctions document count and one being the post-sanctions document count. Two measures of voluntary disclosure are used, namely the number of price-sensitive documents, and the number of ASX category 14 documents

Independent variable	All firms		Non BARCEP firms		Bad news firms	
	Price-sensitive docs	Item 14 docs	Price-sensitive docs	Item 14 docs	Price-sensitive docs	Item 14 docs
SANDUM	0.780	−7.666	1.170	−6.132	2.548	−5.160
	(0.691)	(−5.487)	(1.764)	(−4.905)	(1.674)	(2.627)
SIZE	3.101	4.098	1.123	2.303	2.954	3.518
	(8.664)	(9.246)	(5.537)	(6.024)	(6.209)	(5.731)
INDDUM 1–5	18.244	9.997	11.960	5.306	18.531	9.408
	(13.950)	(6.172)	(15.385)	(3.621)	(10.372)	(4.082)
INDDUM 16–19	−1.749	11.575	−2.402	10.447	−0.671	13.317
	(−0.977)	(5.221)	(−2.318)	(5.347)	(−0.277)	(4.251)
INDDUM 20	−1.338	4.439	1.548	11.287	−2.221	3.535
	(−0.453)	(1.212)	(0.852)	(3.294)	(−0.596)	(0.735)
ISSUEDUM	3.946	1.633	3.137	1.564	5.100	1.742
	(2.619)	(0.875)	(3.750)	(0.993)	(2.425)	(0.642)
NEWSDUM	0.116	−0.451	−0.085	−0.658		
	(0.103)	(−0.321)	(−0.129)	(−0.525)		
BARDUM	4.996	4.403			6.841	6.807
	(2.613)	(1.860)			(2.685)	(2.071)
Intercept	−4.377	−1.412	4.553	5.442	−5.593	−1.046
	(−2.439)	(−0.635)	(4.363)	(2.767)	(−2.310)	(−0.335)
Adjusted R^2	0.270	0.203	0.309	0.108	0.266	0.168
NOB	926	926	757	757	527	527

Sanctions dummy (SANDUM) takes the value 0 for the period prior to 4 September 1994, and 1 thereafter. Firm size (SIZE) is the natural logarithm of the firm's market capitalization measured at 31 August 1992 for the pre-sanctions period and 31 August 1994 for the post-sanctions period. Industry dummy variables take the value 1 if the firm is a member of the ASX two-digit industries in the above table (i.e., INDDUM 1–5, INDDUM 16–19, and INDDUM 20), and 0 otherwise. The equity issue dummy (ISSUEDUM) takes the value 1 if the firm made a rights issue in the pre-sanctions or post-sanctions period respectively, and 0 otherwise. The good news dummy (NEWSDUM) is 1 if the abnormal return (from a 'zero–one' market model) in the pre-sanctions period and post-sanctions period is positive, otherwise it is 0. The BARCEP dummy (BARDUM) is assigned 1 if the firm is included in the BARCEP consensus analyst forecast database, and 0 otherwise.

However, when estimates of equation (1) are confined to firms without a BARCEP-reported analyst following, there is some evidence of a post-sanction increase in disclosures flagged as price sensitive, although not for the regression using item 14 disclosures as the dependent variable. Likewise, when equation (1) is estimated solely for firms classified as 'bad' news firms, the results provide some support for the view that the statutory sanctions had some effect on the disclosure

of bad, *vis-à-vis* good news.[18] There is a statistically significant positive coefficient for the sanctions dummy when NUMDOCS is measured as price sensitive disclosures, but this reverses when item 14 ('Other') documents are used as the measure of voluntary disclosure.

Discussion

Several aspects of the results reported in Table 2 are worthy of further comment. First, it is clear that results reported in earlier studies of voluntary disclosure (e.g., size, equity issuance and industry effects) are also evident in our results. The relatively consistent findings of the control variables having the predicted sign adds to our confidence that equation (1) is well specified, relative to its limited theoretical underpinnings.

Overall, Table 2 provides only limited evidence at best of any impact from civil and criminal sanctions. There is some evidence of increased voluntary disclosure among smaller (i.e., non-BARCEP) and for 'bad news' firms, which is consistent with the argument, favoured by supporters of statutory sanctions, that these firms are typically less forthcoming with timely voluntary disclosures. As noted in our earlier discussion, although much of the extant analytical and empirical disclosure literature predicts the revelation of good news, other research (e.g., Skinner 1994, 1997) finds some support for the early release of bad news in an attempt to minimize expected litigation costs. The introduction of statutory civil and criminal sanctions may therefore affect the timely revelation of bad news more significantly than good news.

However, we caution against concluding that sanctions have had the 'desired' effect. First, it is noted that the results are not consistent for our two measures of voluntary disclosure (i.e., item 14 and price sensitive). This may reflect an increasing degree of vigilance by the ASX in identifying price sensitive documents and/or a greater effort at classifying releases differently from 'Other'. Both possibilities are consistent with the decline in item 14 ('Other') disclosures reported in Table 1. Second, it must be remembered that, particularly by international standards, the market capitalization of non-BARCEP firms is very small. Hence, the economic significance of any modification to voluntary disclosure policy among smaller ASX listed firms is doubtful.

ANALYSTS' FORECASTS

Descriptive Statistics

Using data for ninety-two BARCEP firms, Table 3 describes several properties of analysts' forecasts, for both the pre- and post-sanctions periods. Three measures of forecast error (mean error, mean absolute error, and mean square error) are reported, as well as a measures of analyst disagreement, which is the standard deviation of analysts' forecasts. All measures use the BARCEP forecast of net profit after tax

[18] Thirty-eight firms are classified as good news in both periods, while 323 firms have good news in only one period. There are 51 firms classified as bad news in both periods, while 425 firms have bad news in only one period.

TABLE 3

Mean forecast error, mean absolute forecast error, mean square forecast error and analyst disagreement for Australia-domiciled BARCEP companies, pre-sanctions and post-sanctions

Month	Forecast error	Absolute forecast error	Square forecast error	Analyst disagreement
Pre-sanctions				
−11	−0.00322	0.01853	0.00135	0.00976
−10	−0.00231	0.01818	0.00133	0.00873
−9	−0.00202	0.01748	0.00128	0.00848
−8	−0.00202	0.01693	0.00122	0.00814
−7	−0.00172	0.01564	0.00110	0.00790
−6	−0.00032	0.01197	0.00061	0.00826
−5	−0.00065	0.01128	0.00054	0.00845
−4	0.00020	0.01060	0.00050	0.00743
−3	0.00061	0.00975	0.00044	0.00706
−2	0.00090	0.00931	0.00041	0.00706
−1	0.00141	0.00902	0.00037	0.00711
Post-sanctions				
−11	−0.00424	0.01760	0.00109	0.00783
−10	−0.00480	0.01692	0.00102	0.00747
−9	−0.00443	0.01624	0.00091	0.00716*
−8	−0.00383	0.01481	0.00073	0.00705
−7	−0.00381*	0.01373	0.00062	0.00690
−6	−0.00324*	0.01191	0.00049	0.00627*
−5	−0.00217*	0.01012	0.00038	0.00564*
−4	−0.00133*	0.00936	0.00034	0.00558*
−3	−0.00089*	0.00861	0.00031	0.00533*
−2	−0.00147*	0.00616	0.00008	0.00496*
−1	−0.00107*	0.00531*	0.00007*	0.00498*

* The difference between the metric pre-sanctions and post-sanctions is statistically significant at 0.1, based on a Mann-Whitney two-tailed *U*-test.
The numbers in the column headed 'Month' indicate forecasts made eleven, ten, etc. months before the company announced, via its preliminary final statement filed with the ASX, its actual net profit after tax (NPAT) for the financial year. A consensus forecast error for a given company in a given month is defined as the company's actual NPAT less the mean of the analysts' NPAT forecasts for that company that month, divided by the company's equity capitalization thirteen months before the report was announced. The disagreement measure is the standard deviation across analysts' forecasts of NPAT for that company that month, again divided by the company's equity capitalization. The pre-sanctions period includes reports for fiscal years ending between August 1992 and June 1994; the post-sanctions period includes fiscal years ending between June 1995 and December 1995.

(NPAT), as well as actuals reported by BARCEP (for consistency purposes). All forecasts and actuals are deflated by market capitalization.[19]

[19] For example, the absolute forecast error at month −11 averaged 0.019, which means that analysts' average error was about 2 per cent of market capitalization.

Table 3 supports several conclusions. First, the classical, optimistic bias of sell-side analysts is manifest in the first seven months of the pre-sanctions period and throughout the post-sanctions period. Second, as the announcement date approaches, the bias towards optimism declines, forecasts become more accurate and analysts tend to agree more on their forecasts. Third, compared to the pre-sanctions period, post-sanctions analysts' forecasts are more optimistic, more accurate and more in agreement.[20] Increased accuracy and greater agreement are predicted outcomes if the statutory sanctions significantly affected corporate disclosure policies in the desired manner. It must be noted, however, that these results do not control for known determinants of analyst forecast accuracy.

Regression Tests

Results from fitting OLS regressions for equations (2a) and (2b) are provided in Table 4. The first column reports evidence on the determinants of bias in analysts' forecasts (i.e., the mean error). Most importantly, it is evident that, post-sanctions, analysts' forecasts are significantly more optimistic (the coefficient for the post-sanctions dummy has a t-statistic of –5.66).

Confidence in the result is enhanced by the intuitively sensible coefficients on many of the control variables. Overall, analysts were not overly optimistic, as the constant term is not significantly different from zero. There is only weak evidence that analyst optimism increased with the length of the forecast period, while any bias towards optimism appears to decline with the extent of analyst following. The results also suggest that optimism is positively related to analyst disagreement and the size of last year's forecast error, and negatively related to firm size. Analysts' forecasts are more optimistic for stocks that were eligible for short selling or which had options traded on them, and less optimistic for resource stocks and industries 16–20 compared with other stocks.

Columns 2 and 3 of Table 4 report tests examining the size of the forecast error (absolute error and squared error respectively). Both measures provide results consistent with the size of analysts' forecast errors having increased significantly post-sanctions. The results also suggest that, as expected, forecast accuracy is inversely related to the length of the forecast period, and positively related to the extent of analyst disagreement. Also, as expected, accuracy improves with firm size, but declines with the size of the previous year's forecast error. Finally (and somewhat surprisingly) we find that the accuracy of analysts' forecasts increased with return volatility but was lower for stocks with options traded on them.

The fourth column of Table 4 provides results relating to the extent of analyst disagreement. There is no evidence of any significant change in analyst disagreement post-sanctions (the coefficient is negative but not significantly different from zero). As expected, analyst disagreement increases with both the forecast period length and the prior year forecast error, and declines with increases in analyst following and decreased optimism in prior year forecasts. There is also evidence

[20] However, as Table 3 indicates, the pre- and post-sanctions accuracy rates were not statistically different until the last month before the company released its annual results.

TABLE 4

Regression estimates of the determinants of the forecast error, absolute forecast error, square forecast error and analyst disagreement for Australia-domiciled BARCEP companies, pre-sanctions and post-sanctions

Variable	Forecast error		Absolute forecast error		Square forecast error		Analyst disagreement	
	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
PERIOD	−0.0002	−1.48	0.0008	8.39	0.0000	4.98	0.0003	8.25
NUMAN	0.0003	1.64	−0.0001	−0.93	0.0000	−1.31	−0.0001	−2.18
DISAN	−0.5729	−7.94	0.9182	16.97	0.0637	11.15	*	*
SIZE	0.0019	3.54	−0.0026	−6.35	−0.0001	−1.58	−0.0023	−15.93
PREVERR	−0.0026	−0.22	−0.0083	−0.94	−0.0017	−1.80	−0.0378	−11.74
PREVABSERR	−0.0286	−2.02	0.0267	2.51	−0.0001	−0.11	0.0124	3.11
VOL	0.0000	−0.01	−0.0001	−3.18	0.0000	−1.37	0.0000	−1.19
INDDUM 1–5	0.0016	1.66	0.0003	0.39	0.0001	0.72	0.0033	12.79
INDDUM 16–19	0.0101	7.14	0.0015	1.43	−0.0001	−0.76	0.0058	15.17
INDDUM 20	0.0088	3.31	−0.0020	−0.99	−0.0003	−1.41	0.0005	0.70
OPTIONS	−0.0027	−2.39	0.0029	3.41	0.0001	1.38	0.0004	1.18
SHORT	−0.0023	−1.91	0.0010	1.15	0.0001	1.20	−0.0006	−1.89
SANDUM 1	−0.0040	−3.08	0.0010	1.04	0.0001	1.05	−0.0001	−0.20
SANDUM 2	−0.0049	−5.66	0.0028	4.21	0.0004	5.38	−0.0001	−0.41
INTERCEPT	−0.0095	−0.20	0.0158	5.66	0.0001	0.27	0.0207	21.62
F-statistic	17.35	*	64.7054	*	22.9486	*	111.07	*
Probability(F)	<.0001	*	<.0001	*	<.0001	*	<.0001	*
Adjusted R^2	0.0854	*	0.26672	*	0.11136	*	0.36852	*
Number of cases	2,452	*	2,452	*	2,452	*	2,452	*

See Table 3 for definitions of forecast error and analyst disagreement.
The regression is fitted by ordinary least squares (OLS) to pooled cross-section and time-series data for each company. The forecast period (PERIOD) is the number of months from the forecast date until the month in which the company files its PFS with the ASX; the number of analysts (NUMAN) is the number of separate forecasts contributed to BARCEP; the disagreement among analysts (DISAN) is the standard deviation across analysts' forecasts; a company's size (SIZE) is measured as the material logarithm of its equity market capitalization in A$ million; the error (PREVERR) and absolute error (PREVABSERR) of last year's forecast are measured at the corresponding month in the year prior to the measurement of the dependent variable; industry dummy variables (INDDUM 1–5, INDDUM 16–19, INDDUM 20) take the value 1 if the firm is a member of the relevant ASX two-digit industry group and 0 otherwise; the existence of ASX options trading (OPTIONS) and approved ASX short-selling (SHORT) are dummies which take the value 1 when these are available, and 0 otherwise; return volatility (VOL) is the sample variance of the share market monthly rate of return on the company's ordinary shares; the existence of statutory sanctions is denoted by the dummy variables SANDDUM 1 and SANDDUM 2, which take the value 1 if the financial year straddles the introduction of statutory sanctions (SANDUM1) or if the financial year ends June 1995 or later (SANDUM2).

that analyst disagreement was higher for the resources and financial sectors (industries 1–5 and 16–19) than for other industries.

Discussion

In summary, despite the initial favourable evidence in Table 3, when other factors known to influence analysts' forecasts are controlled for it seems that statutory sanctions did not have the expected effect if they had significantly improved the quality of the information available to security analysts.[21] From Table 4, it is apparent that post-sanctions, analysts' profit forecasts have become more, not less, optimistic; less, not more, accurate; and there has been no detectable convergence in analysts' beliefs. Obviously, the strength of these conclusions depends on our ability to successfully control for 'other' determinants of the forecast error, its size and the extent of analyst consensus. The results in Table 4 suggest that this has been achieved, as almost all of the control variables have coefficient signs in the expected direction, and many are statistically significant. We therefore conclude that analysts' forecasts have not changed post-sanctions in a manner consistent with statutory sanctions increasing the flow of timely, voluntary disclosures.

SHARE PRICE EVIDENCE

Anticipation of Profit Reports

Tables 5 and 6 report tests of the effect of statutory sanctions on the extent to which periodic profit reports are anticipated. The ASX's All Ordinaries Accumulation Index was applied to end-of-month share prices to calculate market-adjusted returns. Long positions were taken on 'good news' stocks (i.e., those that gained relative to the market over the twelve months leading up to their PFS or the six months leading up to their HYR) and short positions in the 'bad news' stocks, each position being opened at the start of the holding period (i.e., at the end of month –12 in the case of a PFS, where –12 denotes 12 months prior to month 0, which is the announcement month itself). Cumulative market-adjusted returns were calculated from the end of month –6 (–12) to the end of month t, $t = -5, \ldots, 0$ (month t, $t = -11, \ldots, 0$) for each stock with a complete set of monthly share prices over the six (twelve) months leading up to an HYR (PFS) announcement month. Portfolios were then formed; for instance, companies that reported a PFS between 1 January 1993 and 4 September 1994 formed a 'pre-sanctions' portfolio and those that reported between 1 July 1995 and 29 March 1996 formed a 'post-sanctions' portfolio.[22] Portfolio members' cumulative market-adjusted returns were averaged, and for PFSs the ratio of the average return from month –12 to month t to the

[21] Of course, our tests assume that analysts will take full advantage of more timely voluntary disclosures. However, Abarbanell and Bushee (1997) provide evidence consistent with United States security analysts failing to efficiently impound 'fundamental' signals into their earnings forecasts. To the extent this is also true of Australian analysts, then our tests are biased against finding improvements post-sanctions.

[22] The period from 5 September 1994 to 31 December 1994 was excluded for HYRs because reports covering this period overlapped the introduction of statutory sanctions.

TABLE 5

Evidence on differences in the rate at which the market anticipates the information content of half-yearly reports filed by companies listed on the ASX

Month	N1	N2	AV1	AV2	X = AV1 – AV2	$p(X > C)$
Pre-sanctions v. post-sanctions; all firms						
–5	1059	1186	0.185	0.169	0.015	0.747
–4	1059	1186	0.341	0.322	0.019	0.754
–3	1059	1186	0.518	0.486	0.032	0.835
–2	1059	1186	0.672	0.629	0.044	0.905
–1	1059	1186	0.838	0.805	0.033	0.884
Pre-sanctions v. post-sanctions; BARCEP firms						
–5	188	175	0.200	0.073	0.127	0.993
–4	188	175	0.387	0.160	0.227	0.999
–3	188	175	0.573	0.318	0.255	1.000
–2	188	175	0.824	0.479	0.345	1.000
–1	188	175	0.851	0.807	0.044	0.796

The metric which is the basis of Table 5 is the proportion of the full period's value-relevant information that is reflected in share prices by the end of the indicated month. For half-yearly reports, the full period is assumed to be from the end of month –6 (i.e., six months before the announcement month) to the end of month 0 (the announcement month itself). The columns headed N1 and N2 indicate the number of cases in each set (e.g., there were 1,059 cases in Set 1, Pre-sanctions, All Firms; and 1,186 cases in Set 2, Post-sanctions, All Firms). The columns headed AV1 and AV2 contain the mean metrics for Set 1 and Set 2 respectively; X = AV1 – AV2 denotes the difference between the means for Sets 1 and 2; and $p(X > C)$ is the relative frequency (resampling probability) with which X exceeded the similarly calculated difference between the mean metrics for two sets, of size N1 and N2 respectively, formed by successive random drawings sampling with replacement from the combination of Sets 1 and 2. The resampling probability is the result of 10,000 trials.

average return from month –12 to month 0 was then calculated (the starting point was month –6 for HYRs). This ratio is reported in Tables 5 (HYRs) and 6 (PFSs). The statistical significance of the difference between the average degree of anticipation reflected in market prices was assessed using standard resampling methods. Hence, Tables 5 and 6 report respectively the average proportion of the full period's return that was reflected in prices by the end of the indicated month. Pre-sanctions and post-sanctions reports are compared for all firms, and then for BARCEP firms only.

The results for HYRs (Table 5) are as follows. First, averaged over all firms, the mean level of anticipation was not significantly different pre- and post-sanctions; for example, by the end of month –3, 51.8 per cent of the information was reflected in pre-sanctions prices while 48.6 per cent was reflected in post-sanctions prices, but this difference of 3.2 per cent could easily have been a chance result (probability = 0.165). Second, for the BARCEP firms, the degree of anticipation post-sanctions has been significantly less except in the last month before the earnings disclosure, when although anticipation was on average less post-sanctions, the difference between the pre- and post-sanctions levels was not statistically significant.

TABLE 6

Evidence on differences in the rate at which the market anticipates the information content of Preliminary Final Statements filed by companies listed on the ASX

Month	N1	N2	AV1	AV2	X = AV1 − AV2	$p(X > C)$
Pre-sanctions v. post-sanctions; all firms						
−11	683	737	0.116	0.121	−0.005	0.402
−10	683	737	0.196	0.221	−0.025	0.170
−9	683	737	0.280	0.331	−0.051	0.054
−8	683	737	0.336	0.416	−0.080	0.008
−7	683	737	0.416	0.531	−0.115	0.001
−6	683	737	0.506	0.641	−0.135	0.000
−5	683	737	0.600	0.731	−0.131	0.000
−4	683	737	0.683	0.829	−0.146	0.000
−3	683	737	0.753	0.945	−0.192	0.000
−2	683	737	0.849	0.996	−0.147	0.000
−1	683	737	0.902	0.952	−0.050	0.006
Pre-sanctions v. post-sanctions; BARCEP firms						
−11	153	85	0.073	0.084	−0.011	0.405
−10	153	85	0.181	0.111	0.069	0.840
−9	153	85	0.315	0.201	0.114	0.899
−8	153	85	0.439	0.304	0.134	0.906
−7	153	85	0.467	0.421	0.045	0.682
−6	153	85	0.496	0.543	−0.048	0.307
−5	153	85	0.554	0.597	−0.043	0.315
−4	153	85	0.644	0.663	−0.020	0.423
−3	153	85	0.758	0.720	0.038	0.663
−2	153	85	0.856	0.953	−0.097	0.117
−1	153	85	0.855	0.920	−0.065	0.102

See Table 5 for an explanation of how this table was constructed.

A clearer picture emerges when returns are calculated relative to PFS announcements (Table 6). The main results are as follows. First, averaged over all firms, the mean level of anticipation was significantly higher post-sanctions from month −9 onwards; for example, by the end of month −3, 75.3 per cent of the information was reflected in pre-sanctions prices while 94.5 per cent was reflected in post-sanctions prices, and this difference of −19.2 per cent was most unlikely to have been a chance result (probability < 0.001). Second, for the BARCEP firms, the degree of anticipation post-sanctions was not significantly greater, except possibly in the last two months before the disclosure (probabilities < 0.117 and 0.102 respectively).

In summary, there is some evidence that the share market has derived a benefit from sanctions in the sense that share prices on the whole have anticipated to a greater extent the information content of PFSs. The validity of this conclusion is

TABLE 7

Distributional statistics from the regression of a company's monthly share volatility on the number of price-sensitive documents filed with the ASX that month and three indexes of market-wide volatility

Item	Percentile							Percentile when $p(t)$ is		
	5	10	25	50	75	90	95	0.90	0.95	0.99
Prob(t-stat/coeff. = 0)										
Constant	0.698	0.800	0.927	0.986	0.998	1.000	1.000	19	30	49
NUMDOCS	0.116	0.207	0.384	0.655	0.911	0.989	0.998	74	81	89
SANDUM	0.030	0.051	0.156	0.363	0.665	0.883	0.946	78	86	94
NUMDOCS. SANDUM	0.022	0.069	0.243	0.498	0.761	0.918	0.961	91	95	99
ASX	0.107	0.170	0.345	0.614	0.867	0.967	0.988	87	93	98
MSCI	0.066	0.116	0.273	0.504	0.783	0.923	0.960	87	93	98
SP	0.006	0.015	0.091	0.318	0.610	0.823	0.897	90	95	99
Other statistics										
Durbin-Watson stat.	1.385	1.525	1.715	1.928	2.141	2.329	2.442			
Adjusted RSQ	−0.099	−0.074	−0.034	0.027	0.119	0.207	0.293			
Stock volatility (dep. var.)	0.037	0.042	0.056	0.097	0.156	0.199	0.219			

A company's monthly share volatility is measured by the absolute value of its discrete share market rate of return that month. ASX refers to the ASX's All Ordinaries Accumulation Index, MSCI refers to Morgan Stanley Capital International's World Index, and SP refers to the Standard and Poor's 500 Index. NUMDOCS and SANDUM are as described in Tables 2 and 4.

tempered by our assumption that the information content of PFSs and market-adjusted share returns are isomorphic, as well as evidence that the effect of sanctions appears to have been concentrated among firms of less interest to institutional investors.

Volatility and Disclosure

Tests of equation (3) are reported in Table 7. Our measure of monthly price volatility is the absolute value of the monthly discrete rate of return on the stock.[23] The first seven numeric columns contain selected percentile values, across the 727 companies, of the probability of observing the estimated regression coefficient if its true value were zero. For instance, in half the regressions fitted there was at least a 0.986 probability that the true value of the regression constant term was not zero (first row of numbers, fiftieth percentile). The last three numeric columns give an alternative way of looking at the same findings. They contain the percentile of the distribution when the t-probability reached the indicated value. For instance, for only 19 per cent of companies was there a less than 0.90 probability that the

[23] Extreme returns, defined to be those less than −80 per cent and greater than 400 per cent, were winsorized to those values.

true value of the regression constant term was not zero (first row, eighth column of numbers).

Overall, the regression model performs poorly. For instance, the median adjusted R^2 is 0.027. Table 7 shows that the relationship between individual stock volatility and index volatility was negligible and could easily have been a chance result (see especially the percentile figures in the fifth, sixth and seventh rows and the last three columns). There is some evidence that monthly share price volatility was related to the number of price-sensitive documents filed with the ASX; the relationship was significant at the 10 per cent level or better for 26 per cent of the companies, at the 5 per cent level or better for 19 per cent of the companies, and at the 1 per cent level or better for 11 per cent of the companies. But the evidence is weak. Moreover, there is also weak evidence in Table 7 that, holding the other variables constant (in particular, the number of price-sensitive documents filed each month with the ASX), the post-sanctions period may have been marked by higher volatility at the company level, which is in contrast to (unreported) simple tests of market volatility.[24] One interesting aspect of the results in Table 7 is that, despite the greater number of price-sensitive documents filed post-sanctions, their weighting in explaining share return volatility has not increased. The coefficient of the variable that reflects the interaction between the post-sanctions period and the number of price-sensitive documents is not statistically significant.

CONCLUSIONS

Differences in corporate disclosure policies, and especially the extent of voluntary forward-looking disclosure, are often attributed (at least partially) to differences in regulation and enforcement procedures. Politicians and corporate regulators frequently express the view that substantial civil or criminal penalties will significantly affect corporate behaviour. The introduction of such sanctions in Australia with respect to existing ASX disclosure rules provides an excellent opportunity to test this proposition, as the key requirement of the relevant ASX listing rule (i.e., the maintenance of an informed market) was not changed. Rather, legislative action was in the form of providing statutory civil and criminal sanctions to 'enforce' ASX listing rules.

However, identifying the effect of such legislative action on corporate disclosure policies is a difficult task. Essentially, tests involve the assumption that sufficient controls can be put in place to be confident that a temporal intervention (i.e., the date at which statutory sanctions become operative) is sufficient to distinguish the effect of these sanctions. Given the relatively *ad hoc* nature of empirical models of voluntary disclosure, we also turn to several indirect indicators (i.e., possible consequences) of increased timely, voluntary disclosure. These are the extent of disagreement among, and accuracy of, analysts' earnings forecasts, the extent to which the value-relevant components of periodic accounting reports are anticipated, and the linkage between corporate disclosures and share price volatility.

[24] These results are available on request from the authors.

The results are best described as mixed. First, although total disclosures increased post-sanctions, disclosures classified as 'price-sensitive' by the ASX only became more frequent for firms without a large analyst following and for firms which are more likely to have revealed relatively bad news. Second, after controlling for other intervening variables such as firm size, industry group and trading-based incentives to collect information, the estimates suggest that forecasts became *less* accurate and that analyst disagreement remained at about the pre-sanctions level. Third, post-sanctions, share prices on the whole have anticipated earlier the value-relevant components of a company's preliminary final statement; however, the information advantage is concentrated among companies of less interest to institutional investors. Fourth, despite the increase in the frequency with which companies have filed price-sensitive documents post-sanctions, the weight placed on each document's ability to explain return volatility is not statistically different from the pre-sanctions period.

Caution is needed in interpreting these results. The four principal tests are clearly not independent. Moreover, the time span since the introduction of sanctions until the end of our data effectively includes only one reporting year for companies with 30 June fiscal year ends (i.e., about 75 per cent of Australian firms), while commonalities across firms in the samples further reduce the statistical reliability of the effects observed. Nonetheless, it seems reasonably evident that there is not, at this point, strong evidence of statutory civil and criminal sanctions having a marked effect on corporate disclosure policies.

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