The Impact of Sustainability and Balanced Scorecard Disclosures on Market Performance: Evidence from Australia's Top 100

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Abstract:

The purpose of this study is (1) to examine the extent of disclosure of sustainability reports (SRs)and balanced scorecards (BSCs) among Australia's Top 100 companies; and (2)to ascertain whether correlations exist between sustainability and BSC reporting, share market performance and perception as well as company size and industry. As the use of BSCs and SRs gains popularity, it is reasonable to expect that large firms and those belonging to environmentally sensitive industries would be more willing to disclose this information publicly to signal their superiority and deflect public scrutiny.

The results show that size and industry are significantly related to disclosures. Disclosers are seen to outperform the non-disclosers in terms of shareholder returns and market perception in the year before the global financial crisis, suggesting that the financial crisis may have introduced more volatility to market performance.

Keywords:

Balanced Scorecard (BSC), Sustainability Report (SR), Top 100 Australian Listed Companies

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Introduction

The rapid proliferation of sustainability reports (SRs) has been well documented over the past few decades (Gray, Kouhy and Lavers, 1995a; Deegan, Rankin and Tobin, 2002; KPMG, 2008). Although the literature suggests that increased reporting does not always translate to improved performance[1], more recent studies provide evidence of positive association between environmental disclosure and environmental performance (see Al-Tuwaijri, Christensen and Hughes, 2004; Clarkson, Li, Richardson and Vasvari, 2008). There is also evidence that environmental performance information is valuable to investors (see for example, Blacconiere and Patten, 1994; Cormier and Magnan, 1997; Clarkson, Li and Richardson, 2004) and its public disclosure helps to dispel public scrutiny (Patten, 1992; Deegan and Rankin, 1996; Elijido-Ten, 2009).

In the same vein, there is a wealth of studies attesting to the rapid increase in the adoption of varying forms of balanced scorecard (BSC) among companies worldwide. For example, even before the turn of the millennium, Bain and Company (1999, cited in Langfield-Smith, et al, 2009) has reported that 55% and 45% of those surveyed in the US and in Europe, respectively, use some form of BSC. In Australia, Renaissance Worldwide (2000, cited in Langfield-Smith, et al, 2009) has found that more than 30% of firms in the top 500 implement varying forms of multi-perspective scorecard.

The motivation for this research emerged from these two strands of literature: the value relevance of SRs and the disclosure of BSC adoption. As the use of BSC gains popularity, and in the same manner that SRs increase over time, it is reasonable to expect that firms adopting some form of multi-perspective scorecard would become increasingly willing to disclose this information in their publicly available reports to signal their 'superior type' in line with the predictions from the voluntary disclosure theory. It also appeals to intuition

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[1] Early studies provide mixed results with some suggesting weak or even negative relationship between environmental performance and disclosures (e.g. Wiseman, 1982; Fekrat, Inclan & Petroni, 1996; Freedman & Jaggi, 1996; Hughes, Anderson & Golden, 2001).

that companies that are large and those that belong to environmentally sensitive industries are more likely to provide SR and BSC disclosure to avoid societal and regulatory attention as suggested in the overlapping socio-political theories.

Hence, the aims of this study are twofold: (1) to examine the extent of sustainability and balanced scorecard (BSC) public disclosure practice among Australia's Top 100 publicly listed companies; and (2) to ascertain whether correlations exist between sustainability and BSC reporting, share market performance and perception as well as company size and industry.

This is valuable for both the report users as well as providers. While the users want transparency, the report providers would be interested to know if disclosures add value to their firm. To facilitate an exploratory analysis, we focus on the Top 100 publicly listed firms in Australia according to Standard and Poor's/Australian Stock Exchange (SandP/ASX) index. SR and BSC disclosures are found through content analysis of company websites and publicly available reports. Data are collected for 2007 and 2008, i.e. before and during the global financial crisis in an effort to understand its possible effect.

The results show that although all BSC disclosers provide SRs, only around half of the SR disclosers also provide BSC disclosure publicly (48 out of 83 in 2008 and 42 out of 74 in 2007). It is also interesting to note that whilst the SR and BSC disclosers increase from 2007 to 2008, the percentage of BSC disclosers that incorporate sustainability measures/targets into their BSC decrease from about 93% in 2007 to around 85% in 2008 implying that the presence of SRs does not

guarantee the inclusion of sustainability strategies into the firm's BSC. In terms of correlation with the variables of interest, both the 2008 and 2007 logistic regression analyses show that size and industry are significantly related to SR and BSC disclosure. Suggestions that the SR and BSC disclosers outperform the non-disclosers in terms of shareholder returns and year end share price hold true in 2007 but not in 2008 suggesting that the financial crisis may have introduced more volatility to overall market performance.

The rest of the paper proceeds as follows. The next section outlines a brief review of the relevant literature leading to hypotheses development. The sample and research methods are provided next followed by the discussion of results. Finally, the concluding comments are offered together with the limitations and suggestions for further research.

Literature Review and Hypotheses Development

Literature Review

Since the publication of Johnson and Kaplan's (1987) well-debated book entitled *'Relevance Lost: The Rise and Fall of Management Accounting'*, and the subsequent introduction of the BSC (Kaplan and Norton, 1992), the literature is now replete with studies attesting to its advantages and benefits (e.g. Kaplan and Norton, 1996; Chenhall, 2005; Ittner, Larcker and Randall, 2003; Assiri, Zairi and Eid, 2006). The Kaplan and Norton BSC model[2] promotes the translation of organisational mission and strategies into objectives. Performance measures and targets are then developed from the objectives set in each of the four perspectives: (1) financial; (2) customer; (3) internal business processes; and (4) learning and growth.

The literature identifies various advantages of adopting the BSC including, but not limited to,

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[2] It is important to note that not all multi-perspective performance measurement systems are exact implementations of Kaplan and Norton's (1992) BSC since others omit, change or add other perspectives such as social and environmental matters (Malina & Selto, 2001; Ittner, Larcker & Randall, 2003; Zingales & Hockerts, 2003). In this research, the term BSC is used loosely to cover the varying forms of multi-perspective scorecard and is not restricted to the strict definition of the Kaplan and Norton BSC model.

greater measurement diversity, strategic alignment and increased operational efficiencies. Numerous authors (Brancato, 1995; Fisher 1995a) have reported that firms find financial measures to be lacking in predictive ability to explain future performance as well as providing little information on the causes and solutions to problems. The adoption of BSC allows firms to supplement financial metrics with a diverse mix of non-financial performance measures that can be used as leading indicators of financial performance (Ittner and Larcker, 1998; Behn and Riley, 1999; Banker, Potter and Srinivasan, 2000; Nagar and Rajan, 2001) thereby enabling better monitoring of strategic progress and success.

Although some studies consider the linkages and effectiveness of BSC implementation to strategy and value drivers (Hoque and James, 2000; Iselin, Mia and Sands, 2008; Yu, Perera and Crowe, 2008), others show the positive impact of BSC implementation on financial and operating performance (Davis and Albright, 2004; DeBusk and Crabtree, 2006).

In their survey of 66 Australian manufacturing companies, Hoque and James (2000) provide evidence that greater BSC usage is associated with improved performance and larger firms make more use of BSC. In another Australian study, Iselin, et al (2008) interviewed fifty CEOs from the manufacturing corporations with sales revenue greater than $100 million. They reported that the strength of the alignment of strategic goals and the performance reporting system is positively associated with performance. Similarly, Yu, et al's (2008) survey of Australian manufacturing firm managers reveals that those who perceive that their BSC measures are linked to strategy and are causally affecting each other also perceive a higher level of BSC effectiveness.

The effect of BSC adoption on shareholder returns has also been examined in prior studies (Ittner, et al, 2003; Crabtree and DeBusk, 2008) although the focus on these studies is on adoption and not on external disclosure. Turning to their findings, it appears that the results are mixed. Using a sample from the US financial services firms, Ittner, et al (2003) examined BSC usage as a dichotomous variable ('yes' for BSC users and 'no' for non-

users). They found no evidence that BSC usage is associated with stock market returns although they acknowledge the existence of a time lag between BSC adoption and improved performance. In contrast, Crabtree and DeBusk (2008) investigated BSC adopters in the three-year period following adoption. Using data from an online survey and a matched pair design in conjunction with event study methodology, BSC-adopters were matched with non-adopters based on various criteria including industry. They reported that BSC-adopters significantly outperformed their industry counterparts who did not adopt BSC.

These prior studies are founded on economic and contingency theories. Contingency theory promotes that management control systems must be aligned with organisational mission and strategy (for more, see Fisher, 1995b) while economic theories advocate that the design of the firm's communication and reward systems should be a function of its strategy (see Milgrom and Roberts, 1992). These theories have been extended to argue that an important factor to manage links between strategy and performance is the identification and measurement of the drivers that lead to firm value (Ittner and Larcker, 2001). Promoting this argument, Ittner, Larcker and Randall (2003, p.719) claimed that by linking strategies with the value drivers tied in with the goals/objectives, the performance measurement system will 'improve the communication of the *specific* actions required to achieve the chosen strategy, motivate performance against strategic value driver goals, and provide more rapid feedback on whether strategy is achieving its objectives'.

In line with the goal of improving communication, Ittner, et al (2003) and others (e.g. Gates, 1999; Eccles, Herz, Keegan and Phillips, 2001) advocate that the value driver analysis, in particular, and the BSC literature, in general, should not only influence the design and use of measurement systems but should also affect external disclosure requirements. It is this area of BSC research that has been left unattended and is the focus of this exploratory study. As the use of BSC gains credence not only as a performance measurement system but also as a means for improved communication, it is important to

explore possible correlations between BSC public disclosure and market performance/ perception.

Although seemingly unrelated, the sustainability (social/environmental) reporting literature can offer useful insights. As recently as forty or fifty years ago, it was a struggle to arouse general public interest concerning the declining state of the environment even in developed countries. These days, such concepts as becoming 'carbon neutral,' 'green consumerism' and 'eco-efficiency' appear to have been embraced in the developed world. Indeed, as the use of BSC gains popularity and as climate change becomes a significant public policy issue, a growing body of research emerge on the viability of embedding sustainability into corporate strategy and using the BSC as a vehicle to align corporate values with financial performance (Epstein and Roy, 2001; Figge, Hahn, Schaltegger and Wagner, 2002; Crawford and Scaletta, 2006). The literature suggests that a Sustainability Balanced Scorecard (SBSC) can be developed in a number of ways such as: (1) by incorporating sustainability measures within the original four BSC perspectives as introduced by Kaplan and Norton (1992); (2) by adding a fifth 'sustainability' or 'social and environmental' perspective to the BSC; or (3) developing a separate sustainability scorecard. Novo Nordisk, a Danish pharmaceutical manufacturer is an example of a company that builds sustainability measures into its BSC (see Zingales and Hockerts, 2003).

Clarkson, Li, Richardson and Vasvari (2008) classify the environmental accounting research into three groups: (1) strategic factors affecting firm's decisions to disclose environmental information; (2) the relationship between environmental performance and disclosure; and (3) the value relevance of environmental performance information. It is interesting to note the similarities between these research categories and those of prior research in the BSC literature despite the fact that BSC public disclosure has not been examined yet. Given that SRs of all kinds continue to increase over time (e.g. Gray, Kouhy and Lavers, 1995a; Deegan, Rankin and Tobin, 2002; KPMG, 2008), it is reasonable to expect that BSC reporting will also increase. It is also conceivable that BSC adopters providing SRs are the ones more willing to provide BSC disclosure as they are more likely to have this information readily available.

Two sets of theories that have been commonly used in the environmental reporting literature are considered useful in developing the hypotheses to be tested in this study. These are considered next.

Hypotheses Development

In the voluntary reporting literature, Verrecchia (1983) and Dye (1985), proposed that firms with 'good news' have greater incentives to disclose their 'superior type' to distinguish themselves from the inferior performing firms. The notion is that inferior performers will have difficulty mimicking the disclosure activity of superior performers because of proprietary costs associated with disclosure. As a result, this theory suggests that good performers are likely to disclose more. The voluntary disclosure theory is later applied to environmental reporting studies (see Li, Richardson and Thornton, 1997; Bewley and Li, 2000; Clarkson, et al, 2008) predicting a positive relationship between the level of voluntary environmental disclosures and firms with superior environmental performance (due to proactive environmental strategies). As noted earlier, more recent environmental reporting research provide evidence of positive association between environmental disclosure and performance (see Al-Tuwaijri, Christensen and Hughes, 2004; Clarkson, et al, 2008) suggesting support for the voluntary disclosure theory.

The overlapping socio-political theories including political economy, legitimacy and stakeholder theory (see Lindblom, 1994; Gray, Kouhy and Lavers, 1995b; O'Donovan, 2002; Patten, 2002; Elijido-Ten, 2008; 2009) could offer additional insights. Collectively, these theories advocate that as firms face more societal and political pressures; and as their legitimacy is threatened by increased public scrutiny due to poor environmental performance, their incentive to provide more environmental disclosures is also heightened. Hence, in the environmental reporting literature, the socio-political theories appear to suggest negative association between disclosure and performance (Patten, 2002). As such, others (like Clarkson, et al, 2008)

consider the predictions from these theories to be contradictory. In this study, however, the predictions from both theories are considered complementary rather than competing.

In line with the voluntary disclosure theory, it appeals to intuition that firms adopting BSC and collecting sustainability data have more incentive to provide public disclosure to signal their 'superior type'. It would be difficult for inferior performers (non-BSC adopters) to mimic the disclosure practice of superior performers as suggested in the voluntary disclosure literature. As such, we would expect that the SR and BSC disclosers would outperform the non-disclosers in terms of shareholder returns and market perception. Hence, the following hypotheses are introduced:

H1: Sustainability and BSC disclosures are significantly associated with shareholder returns (growth in earnings per share) as implied in the voluntary disclosure theory.

H2: Sustainability and BSC disclosures are significantly associated with market perception (growth in year-end share price) as implied in the voluntary disclosure theory.

Similarly, in line with the socio-political theories, sustainability and BSC reporting is a function of the political and social pressures faced by the firm. To the extent that companies that are large and those that belong to environmentally sensitive industries (ESI) face more societal scrutiny, these firms are more likely to provide more disclosure. Thus, the following hypotheses are developed:

H3: Sustainability and BSC disclosures are significantly associated with the size of the firm as implied in socio-political theories.

H4: Sustainability and BSC disclosures are significantly associated with the industry as implied in socio-political theories.

Research Design

Data Collection

Prior research examining the relationship between BSC and other variables such as size and market factors (Hoque and James, 2000; Ittner, et al, 2003; Iselin, et al, 2008), focus mainly on BSC adoption and not on external disclosure. These studies use data from company interviews/surveys thereby limiting the coverage of their findings to those firms willing to participate in the study.

In contrast, this research is an archival-empirical study, using publicly available data from corporate reports including company websites. Being exploratory, we start by doing a word search from DatAnalysis to find listed companies that are using BSC. Using terms such as "balanced scorecard," "strategic performance system," "performance measurement model" and other variations, we compile 43 companies, all of which are in the Top 100.

From this, it is decided to focus on the Top 100 publicly listed firms in Australia according to Standard and Poor/Australian Stock Exchange (SandP/ASX) index. This decision is further justified since many of these firms are providing SRs. Likewise, by virtue of their market position (i.e. Top 100), they are more likely to be under closer public scrutiny.

To enable a comparison before and during the global financial crisis, data on firm disclosures are collected for two years - 2007 and 2008 - by going through the company website and doing a search on company reports such as the annual reports (including concise or interim reports), shareholder review report, sustainability/environmental reports, social impact/stakeholder report and other website documents.

Industry and financial data such as total revenue, earnings per share and year-end share prices are gathered from FinAnalysis database. Four of the companies in the Top 100 SandP/ASX index as at September 2009 have missing figures for the periods being analysed thus excluded from the sample. Therefore the total sample in this study consists of 96 companies.

SR and BSC Disclosure Model

The empirical tests in this study use measures of SR and BSC disclosure, shareholder return, market perception, firm size and industry classification.

The following model is used:

$$SRandBSC_i(year) = \beta_0 + \beta_1 + \beta_2 GEPS_i(year-1) + \beta_3 GYESP_i(year) + \beta_4 REVLOG_i(year) + \beta_5 IND_i + e$$

Where:

SRandBSC$_i$(year)	=	Sustainability Report (SR) and Balanced Scorecard (BSC) public disclosure practice for firm *i* in 2007 and 2008; 0 = no SR and no BSC; 1 = SR or BSC disclosure only; 2 = SR and BSC disclosure.
β$_0$ and β$_1$	=	Intercept
GEPS$_i$(year-1)	=	Growth in earnings per share for firm *i* in 2006 and 2007;
GYESP$_i$(year)	=	Growth in year end share price for firm *i* in 2007 and 2008;
REVLOG$_i$(year)	=	Natural log of total revenue for firm *i* in 2007 and 2008;
IND$_i$	=	Presence of firm *i* in environmentally sensitive industry in 2007 and 2008; 1 = if the firm belongs to environmentally sensitive industry (energy, utilities, transportation, materials and telecommunication industries); 0 otherwise.
e	=	error term

Variable Measurement

SR and BSC Public Disclosure

The initial part of the analysis is to determine which companies provide sustainability/ environmental reports (SRs) and BSC disclosures in their company website and/or publicly available corporate reports. The SR and BSC disclosure respectively, are dichotomous variables given a value of 1 for discloser, 0 otherwise. Any form of SR disclosure is considered valid (i.e. given a 1) regardless of whether it is on the website, in the annual report or in a separate stand-alone report and no distinction is given for positive or negative news. To be valid, however, the SR disclosure should be more than a generic[3] environmental/sustainability statement.

For BSC reporting, on the other hand, the following criteria must be satisfied before a firm is given a score of 1 (i.e. BSC-discloser): (1) must show a range of 'perspectives' in addition to financial, including but not limited to, customer/market, business process, staff, health, environment, community and sustainability; (2) must have a strategy statement for each perspective; (3) must include objectives, goals or targets or a forward-looking statement of what is expected; and (4) must show a performance section, which could include initiatives and/or actual measurements, which is essentially a backward-looking statement.

To facilitate the ordinal regression analysis, the analysis of SR and BSC disclosures are then combined to have *SRandBSC ratings*. For firms not providing SR and BSC disclosures, a score of 0 is awarded; firms providing either SR or BSC disclosure, 1 is awarded; and for firms providing both SR and BSC disclosures, a score of 2 is given.

Shareholder Return and Share Market Performance

Prior studies use various forms of proxy for financial performance, such as return on assets (e.g. Roberts, 1992) and shareholder returns (e.g Ittner, et al, 2003; Crabtree and Debusk, 2008) recognising a time lag. In this exploratory study, the focus is on shareholder returns and market perception of firms providing SR and BSC disclosures to ascertain whether disclosers outperform those that do not. Hence, to be consistent with prior research, the lagged values of the growth in earnings per share (GEPS) are used.

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[3]Some examples of generic statements not considered as sufficient for SR include a company stating that: (1) they do eTree printing of annual reports; (2) they comply with safety/health/environmental regulation without providing more details; and (3) they are listed on some sustainability index without giving sufficient information.

Furthermore, if the assertion in mainstream finance holds, i.e. that the financial markets are *'informationally efficient',*[4] then it follows that the year end share price of firms should reflect its 'superior/inferior type'. Therefore, another proxy chosen for market performance in this research is the growth in year-end share price (GYESP).

Firm Size and Industry

The size of the firm can also be measured in a number of ways such as total assets, number of employees, sales and market capitalisation. In this study, the natural log of revenue is used consistent with prior accounting research (Roberts, 1992; Hoque and James, 2000; Elijido-Ten, 2009). Log transformation is considered essential because variables with observations that are large in absolute amounts can overwhelm other variables in the regression iteration process.

In terms of industry, the notion advanced in previous studies is that industry classification captures certain systematic relation between consumer visibility and other associated risks such as social/environmental responsibility risk that could lead to regulatory intervention. In this study, industry (IND) is a dichotomous variable: a score of 1 is awarded to firms belonging to environmentally sensitive industry (ESI); 0 otherwise. As in previous research, the environmentally sensitive industries are those in the energy, utilities, transportation, materials and telecommunication industries (Wiseman, 1982, Roberts, 1992; Elijido-Ten, 2007).

Results

Descriptive Statistics

Descriptive statistics are shown in Table 1. Panel A contains the indicator variables whilst Panel B has the continuous variables. An increase in both BSC and SR disclosure from 2007 to 2008 is shown clearly in Panel A. The number of firms with no SR and BSC disclosure (firms with 0) decrease from 22 in

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[4] The ***efficient market hypothesis*** suggests that financial markets already reflect all available information and as such share prices instantly change to reflect any new information (Fama, 1965).

2007 to 13 in 2008 while BSC disclosure (firms with 2) increase from 42 (about 44%) in 2007 to 48 (50%) in 2008. The descriptive statistics also show that only about 42% of the firms included in the sample belong to environmentally sensitive industries such as utilities, energy, telecommunication, transportation and materials (which includes the mining industry).

Since lagged values are used for earnings per share growth (GEPS), the 2006 and 2007 GEPS are shown in Table 1 Panel B. GEPS in 2007 has a maximum (minimum) of 324.10 (-132.90) and a mean (standard deviation) of 18.8 (62.6) while GEPS in 2006 has lower maximum (minimum) 182.70 (-213.00) and a mean (standard deviation) of 12.41 (47.95). This indicates higher shareholder return volatility in 2007 compared to 2006. The year-end share prices for 2007 and 2008 show similar trend with 2008 showing higher volatility as reflected in its range of 111.14 (compared to 64.32 in 2007) and a negative mean of -6.12 (compare to 4.67 in 2007). Despite the fact that Australia has not been as badly hit by the global financial crisis compared to other countries such as the US and many European countries, the descriptive statistics for the Top 100 Australian companies show that the Australian share market has not been immune to the crisis. The natural log of 2007 (2008) revenues have a minimum of 6.45 (5.6), maximum of 10.73 (10.92) with mean of 9.33 (9.43) and standard deviation of .78 (.75).

Bivariate Correlations

Table 2 contains the correlation matrix for 2007 and 2008 in Panels A and B, respectively. The Pearson product moment correlation (shown in the bottom left side) shows the bivariate correlations between the dependent variables SRandBSC07 and SRandBSC08 and the independent variables. The results show that the proxy for size (REVLOG) and industry (IND) are significantly and positively associated with both SRandBSC07 and SRandBSC08 at p<.01. In terms of share market performance measure, only GYESP is positively related to

Table 1: Descriptive Statistics

Panel A: Indicator Variables							
Variable	Variable Description	Number of Firms with 0	(%)	Number of Firms with 1	(%)	Number of Firms with 2	(%)
SRandBSC07	Sustainability Report (SR) and Balanced Scorecard (BSC) public disclosure practice for 2007; 0 = no SR and no BSC; 1 = SR disclosure only; 2 = SR and BSC disclosure	22	22.90%	32	33.30%	42	43.80%
SRandBSC08	Sustainability Report (SR) and Balanced Scorecard (BSC) public disclosure practice for 2008; 0 = no SR and no BSC; 1 = SR disclosure only; 2 = SR and BSC disclosure	13	13.50%	35	36.50%	48	50.00%
IND	Presence of firm in environmentally sensitive industry for both 2007 and 2008; 1 = for firms in the energy, utilities, transportation, materials and telecommunication industries); 0 otherwise	56	58.30%	40	41.70%		

Panel B: Continuous Variables						
Variable	Variable Description	Range	Minimum	Maximum	Mean	Standard Deviation
GEPS06	Growth in Earnings Per Share for 2006	395.70	-213.00	182.70	12.41	47.95
GEPS07	Growth in Earnings Per Share for 2007	457.00	-132.90	324.10	18.84	62.60
GYESP07	Growth in Year End Share Price for 2007	64.32	-4.65	59.67	4.67	10.07
GYESP08	Growth in Year End Share Price for 2008	111.14	-95.95	15.19	-6.12	14.89
REVLOG07	Natural log of total revenue for 2007	4.28	6.45	10.73	9.33	.78
REVLOG08	Natural log of total revenue for 2008	5.31	5.60	10.92	9.43	.75

Table 2: Correlations

Panel A: 2007 Bivariate Correlations (N=96)

Correlations

		SR_BSC07	GEPS06	GYESP07	REVLOG07	INDUSTRY
SR_BSC07	Pearson Correlation	1	.141	.290**	.360**	.394**
	Sig. (2-tailed)		.171	.004	.000	.000
GEPS06	Pearson Correlation	.156	1	.229*	.113	-.146
	Sig. (2-tailed)	.129		.025	.274	.156
GYESP07	Pearson Correlation	.209*	.234*	1	.246*	.034
	Sig. (2-tailed)	.041	.022		.016	.746
REVLOG07	Pearson Correlation	.305**	.106	.144	1	-.033
	Sig. (2-tailed)	.003	.305	.161		.751
INDUSTRY	Pearson Correlation	.393**	-.046	.167	-.125	1
	Sig. (2-tailed)	.000	.659	.105	.227	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Panel B: 2008 Bivariate Correlations (N=96)

Correlations

		SR_BSC08	GEPS07	GYESP08	REVLOG08	INDUSTRY
SR_BSC08	Pearson Correlation	1	-.059	.068	.362**	.383**
	Sig. (2-tailed)		.571	. 511	.000	.000
GEPS07	Pearson Correlation	.032	1	-.063	.092	.052
	Sig. (2-tailed)	.757		.542	.371	.613
GYESP08	Pearson Correlation	-.075	-.384**	1	-.102	.239*
	Sig. (2-tailed)	.465	.000		.324	.019
REVLOG08	Pearson Correlation	.303**	.007	-.147	1	.010
	Sig. (2-tailed)	.003	.948	.152		.924
INDUSTRY	Pearson Correlation	.370**	.163	-.039	-.081	1
	Sig. (2-tailed)	.000	.112	.709	.430	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Note: Spearman's rho is on the top right hand side while Pearson Correlation is on bottom left side of Table 2

SRandBSC07 at 5% significance level for 2007. There is no indication that an unacceptable level of multicollinearity is present because none of the correlation coefficient between predictor variables is higher than 0.80[5]. As an added check, non-parametric Spearman's rho correlation is shown in the top right side of Table 2. Overall, the significance levels shown in non-parametric measure appear to coincide with the parametric measure.

As an aside, an analysis is conducted to check the bivariate correlations between SR and BSC disclosure for both years under examination. As expected, the results (not tabulated) show that SR and BSC disclosures are positively and significantly related at p<0.0001 for both 2007

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[5] A number of statistics experts (see, for example, Hair *et al* 1998; Tabachnik & Fidell 2001) agree that a harmful level of multicollinearity is not present until the correlation coefficient reaches around 0.80 or 0.90.

and 2008. Indeed, it is worth noting that although all BSC disclosers provide SRs, only around half (57% or 42 out of 74) of the SR disclosers also provide BSC disclosure publicly in 2007. About the same proportion holds true for 2008, albeit slightly more at 58% (48 out of 83).

It is also interesting to note that whilst the SR and BSC disclosers increase from 2007 to 2008, the percentage of BSC disclosers that integrate sustainability measures/targets into their BSC decrease from nearly 93% (39 out of 42) in 2007 to around 85% (41 out of 48) in 2008. This implies that the presence of sustainability reports does not guarantee the inclusion of sustainability strategies into the firm's BSC.

Logistic Regression Results

Hypotheses H1 to H4 are tested using logistic ordinal regressions for the two periods 2007 and 2008. In 2007, the period before the global financial crisis, the empirical model is significant at the 0.0001 level with a Chi-square score statistic of 42.63 and 4 degrees of freedom. The McFadden R^2, Cox and Snell R^2, and Nagelkerke R^2 are .208, .359 and .407 respectively, indicating that the model explains between 21% and 41% of the variability in the dependent variable. The model remains significant at 0.0001 level (Chi-square statistic of 29.706) during the financial crisis period (2008), although the McFadden, Cox and Snell and Nagelkerke pseudo R^2 are lower at .157, .266 and .309 respectively. In addition, the Pearson and Deviance goodness-of-fit tests for both years are greater than 0.05 implying the model's estimates fit the data at an acceptable level.

The model estimation is presented in Table 3. For both 2007 and 2008, the analyses show that REVLOG is positively and significantly related to SR and BSC disclosure at 0.01 level supporting H3. Hence, the prediction from socio-political theories that larger firms are more likely to provide SR and BSC public disclosures are supported in the analysis for both periods. On the other hand, whilst IND is also significant at 0.01 for 2007 and 2008, the coefficient estimate sign is negative indicating that non-environmentally sensitive industries are providing SR and BSC disclosures contrary

to expectation that firms belonging to environmentally sensitive industries are more likely to provide disclosures.

Turning to the variables used as proxy for share market performance and perception, the analyses show quite different results before and during the financial crisis period. GEPS and GYESP are both positive and significant at 1% and 5% level, respectively, in 2007 but not in 2008. This could be taken as an indication that SR and BSC disclosers have not been immune to the effects of the global financial crisis. Overall however, the result suggests that in terms of shareholder returns and year-end share price, SR and BSC disclosers outperform the non-disclosers in 2007 but not in 2008. Hence H1 and H2 are supported for the period before the global financial crisis.

Summary, Discussion and Concluding Comments

This study sets out to investigate the extent of sustainability reports (SRs) and balanced scorecard (BSC) disclosures of the Top 100 publicly listed firms in Australia for the periods 2007 and 2008. The results show that SR and BSC disclosures increased from 2007 to 2008 despite the financial crisis. Although all BSC disclosers provide SRs, only around half of the SR disclosers also provide BSC disclosure publicly in both years. Predictions from the voluntary disclosure and socio-political theories adopted in sustainability/ environmental reporting literature are used to develop the hypotheses in this study to examine if there is any correlation between SR and BSC reporting, shareholder return, market perception, size and industry. Logistic ordinal regressions are separately conducted for 2007 and 2008 to ascertain if the global financial crisis has affected SR and BSC disclosure decisions and its association with the variables of interest. The analyses show, for both 2008 and 2007, that size and industry are significantly related to SR and BSC disclosure. Suggestions that market performance and perception for SR and BSC disclosers are better than non-disclosers hold true in 2007 but not in 2008 implying that the financial crisis may have introduced more volatility to market performance.

Table 3: Regression Model and Results for 2007 and 2008

Panel A: Regression Model

$$SR\&BSC_i(year) = \beta_0 + \beta_1 + \beta_2 GEPS_i(year-1) + \beta_3 GYESP_i(year) + \beta_4 REVLOG_i(year) + \beta_5 IND_i + e$$

Where:

$SR\&BSC_i(year)$	=	Sustainability Report (SR) and Balanced Scorecard (BSC) public disclosure practice for firm *i* in 2007 and 2008; 0 = no SR & no BSC; 1 = SR or BSC disclosure only; 2 = SR & BSC disclosure.
β_0 & β_1	=	Intercept
$GEPS_i(year-1)$	=	Growth in earnings per share for firm *i* in 2006 and 2007;
$GYESP_i(year)$	=	Growth in year end share price for firm *i* in 2007 and 2008;
$REVLOG_i(year)$	=	Natural log of total revenue for firm *i* in 2007 and 2008;
IND_i	=	Presence of firm *i* in environmentally sensitive industry in 2007 and 2008; 1 = if the firm belongs to environmentally sensitive industry (energy, utilities, transportation, materials and telecommunication industries); 0 otherwise.
e	=	error term

Panel B: 2007 Results (N=96)

	Estimate	S.E.	Wald	df	Sig.	95% Confidence Interval	
						Lower	Upper
GEPS06	.016	.004	6.367	1	.012	.992	1.009
GYESP07	.126	.024	4.239	1	.039	.947	1.040
REVLOG07	1.026	.383	8.091	1	.004	1.578	7.068
IND	-2.913	.500	12.82	1	.000	1.836	13.055
β_0	6.400	2.935	4.756	1	.029	.648	12.152
β_1	8.737	3.216	7.381	1	.007	2.434	15.039

Model Chi-square = 42.63 with 4 d.f., significant at less than 0.0001 level;
Pseudo R^2: Cox and Snell R^2 .359; Nagelkerke R^2 .407; McFadden R^2 .208

Panel C: 2008 Results (N=96)

	Estimate	S.E.	Wald	df	Sig.	95% Confidence Interval	
						Lower	Upper
GEPS07	-.003	.005	.336	1	.562	-.012	.006
GYESP08	-.008	.025	.089	1	.766	-.057	.042
REVLOG08	1.056	.349	9.135	1	.003	.371	1.740
IND	-2.005	.623	10.366	1	.001	-3.225	-.784
β_0	6.044	2.812	4.618	1	.032	.532	11.556
β_1	8.780	3.071	8.174	1	.004	2.761	14.799

Model Chi-square = 29.706 with 4 d.f., significant at less than 0.0001 level;
Pseudo R^2: Cox and Snell R^2 .266; Nagelkerke R^2 .309; McFadden R^2 .157

The results from this exploratory research are of interest given the insights it provide. The positive and significant findings for earnings per share growth (GEPS) and year-end share price growth (GYESP) for 2007 implies that, absent financial crisis (particularly one of a global nature), SR and BSC disclosers outperform the non-disclosers. Whilst this could be the outcome arising from efficiencies created by BSC implementation, there is a real opportunity for BSC-adopters to differentiate their 'superior type' from other firms as suggested in the voluntary disclosure theory.

Furthermore, the finding that all BSC disclosers are also SR providers could be taken to suggest that BSC public disclosure will continue to increase just as SRs continue to increase over time. From the two years (2007 to 2008) examined in this study, there is already evidence that this is happening. This is potentially advantageous for both the report users as well as the preparers. From the users' point of view, information asymmetry could decrease as more companies show willingness to report on their performance measurement system thereby potentially achieving more transparency. For the preparers, the pressure to provide SR and BSC disclosures publicly could force them to re-examine and improve their financial as well as non-financial strategy, objectives and performance measures making the favourite quote, *"what gets measured gets done,"* self fulfilling.

Likewise, given the insights from the socio-political theories that large firms provide more disclosures (as supported by the findings in this research) it is important that the report users be more discerning in interpreting these voluntary disclosures. Moreover, the negative and significant finding for the industry (IND) could perhaps be taken to suggest that societal and regulatory attention is no longer limited to environmentally sensitive industries given that large firms belonging to non-environmentally sensitive industries could, in fact, be huge carbon emitters by virtue of the size of their operations.

The findings from this study, however, are subject to a number of limitations. Although considerable efforts have been made to choose appropriate proxies after consulting the relevant literature, data constraints may limit the construct validity of some variables. Likewise, it is important to acknowledge the inherent limitations of positivistic empirical research to capture the complexity of numerous dimensions influencing disclosure decisions. It is also necessary to re-iterate that the focus in this study is on BSC public disclosure – not the actual BSC adoption.

Furthermore, due to the fact that the empirical tests are performed on the Top 100 publicly listed companies in Australia, its generalisability could be limited. Despite these constraints, the insights gathered from this exploratory research can be used as a springboard for more in-depth studies particularly since SR and BSC disclosures continue to increase. In particular, future studies could examine the extent by which the BSC disclosers in the Top 100 incorporate sustainability strategy and measures into their multi-perspective scorecard.

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