SUSTAINABILITY, ENVIRONMENTAL PERFORMANCE AND DISCLOSURES

ADVANCES IN ENVIRONMENTAL ACCOUNTING AND MANAGEMENT

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ADVANCES IN ENVIRONMENTAL ACCOUNTING AND MANAGEMENT VOLUME 4

SUSTAINABILITY, ENVIRONMENTAL PERFORMANCE AND DISCLOSURES

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Emerald Group Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2010

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-84950-764-6
ISSN: 1479-3598 (Series)

Awarded in recognition of Emerald's production department's adherence to quality systems and processes when preparing scholarly journals for print

INVESTOR IN PEOPLE

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EDITORS INTRODUCTION

Sustainability is a word that is included often in the current lexicon. In the academic world, the American Accounting Association devoted a plenary session to sustainability accounting in its 2009 annual meeting and the theme of the 2009 Academy of Management meeting was also on green management and sustainability. Many MBA programs have developed a special track focusing on sustainability, which suggests that there is some demand for the graduates of programs specializing in environmental issues. Is this all a fad and just rhetoric or will this emphasis on sustainability lead to discussions, plans, and programs that will be helpful in saving the planet?

Despite the Kyoto Protocol and the promises of world leaders to improve the environment, greenhouse gas emissions (GHG) continue to grow, the other noxious effects of industrialization continue, for the most part, unimpeded, and the planet's resources continue to be depleted. However, the rising prices of oil and the recognition of the limited supply of nonrenewable energy resources have led to a push for new sources of energy, many of which are greener than previous sources. Furthermore, as a consequence of the worldwide recession, the increasing use of energy has slowed giving world leaders a chance to rethink ways to achieve our future energy needs. Thus, despite the lack of real environmental progress since the last volume of this journal was published, there is hope for a greener future.

Accounting as a discipline has not made any real strides in the race for planetary survival. Although the AAA meeting did pay lip service to sustainability accounting, there have been no changes in how accounting is taught or practiced. Social/environmental/sustainability accounting is still a fringe subject despite the real consequences in ignoring this area. Unless this area is formally recognized in accounting, firms will continue to view it as a way to manage their reputation without actually making any real changes.

The chapters included in this volume discuss different aspects of sustainability, environmental performance, and environmental disclosures. Overall, it is fairly obvious from these chapters that firms are aware of the impact of their activities on the environment, but what they do about it and how they report it is the focus of many of these chapters. Although the chapters come to different conclusions, it appears that firms have problems in

both managing their message and in the impact of their activities on the environment.

The first chapter in this volume by Rob Gray, Dave Owen, and Carol Adams is devoted to developing theories for social accounting. In the first section of their treatise, the authors provide an excellent description for developing theories in any social science, and we find it to be a great pedagogical tool for a research methodology course in accounting. By describing and categorizing the theories for social accounting research and literature (in a sense mapping the research), the authors provide a framework to better understand the literature and to propel its progress. They provide a great starting point for those thinking about entering the field. There is also a sense of hope that social accounting can lead to policies that will sustain the planet in the future.

Vanessa Magness, in the second chapter, examines the market reaction to environmental disclosures made by the Canadian mining industry following an environmental disaster at a mine owned by a Canadian company. Prior studies had indicated that environmental disclosures mitigate the market impact for the firm of negative environmental events, but she attributes this to signaling. However, Professor Magness considers different elements of the environmental disclosures in her analysis and obtains conflicting results. She concludes that there is miscommunication between management's signal and investors' interpretation of environmental information.

Environmental and sustainability performance are seen by many managers as being elements of corporate reputations. In the third article in this volume, Darryl Lee Brown, Ronald P. Guidry and Dennis M. Patten explore the relationship between corporate reputation and sustainability reports. Using *Fortune* magazine's annual survey of America's most admired companies as their source for reputation, they conclude that reputations do not improve for first time issuers of standalone sustainability reports. Thus, it appears that just issuing a report does not increase a firm's reputation. However, there is a strong correlation between the highest (lowest) quality reports and reputation. This seems to imply that managing one's reputation requires some real effort.

Priscilla S. Wisner, Marc J. Epstein, and Richard P. Bagozzi, in the fourth chapter, examine companies that have proactive environmental management strategies. For these companies, environmental commitment is a top priority for all levels of management. Using seven measures of management control actions that manifest environmental proactivity, the authors find strong evidence showing that five of seven measures made a difference in performance. Furthermore, they find that firms that are considered to have

the best environmental performance are those that are best in proactively integrating the environmental management decisions into their processes.

When the Kyoto Protocol was ratified in February 2005, the European Union (EU) had a plan in place to immediately implement it. Martin Freedman and Bikki Jaggi, in the fifth chapter, compare the GHG disclosures and performance that were made by companies from the EU and two other countries that ratified the protocol, that is, Japan and Canada. They find that despite their initial start, the EU companies overall disclose less than either Japanese or Canadian companies about GHG and the protocol. Furthermore, they find that within the EU countries there is differential GHG disclosure. In terms of the relationship between GHG performance and disclosure, they detect no significant association.

The volume concludes with a research note from Charles H. Cho and Dennis M. Patten. In this note, the authors lament that few US accounting professors classify themselves as social (w in Hasselback's accounting directory) and that there are very few social accounting articles (using the broadest definition) that have been published in four of the top journals in accounting. They believe that there are many more US academics that fall in the social accounting camp based on their publications and that there are numerous high-quality outlets from social accounting research. Nevertheless, they emphasize that there is a need for expanding and nurturing this area of accounting.

Marty Freedman
Bikki Jaggi
Editors

SOME THEORIES FOR SOCIAL ACCOUNTING?: A REVIEW ESSAY AND A TENTATIVE PEDAGOGIC CATEGORISATION OF THEORISATIONS AROUND SOCIAL ACCOUNTING

Rob Gray, Dave Owen and Carol Adams

ABSTRACT

This chapter is a speculative examination of the way in which theory is used in the social accounting literature. It is intended as an initial guide for those approaching the area for the first time; it is intended as a map for those in the field who would like to adopt a bigger picture for their work and it is intended as a wake-up call to those of us stuck in unconscious ruts. The chapter's departure point is the recognition that social accounting requires a reasonably sophisticated awareness of theory – not least because the subject matter itself is so contentious and conditional. The chapter's ambitions are to encourage a more evaluative and policy-based approach to the subject matter of social accounting; to offer a pedagogic basis to help others make some sense of theory in social accounting and to seek to empower and liberate social accounting scholars

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 1–54

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004005

by assisting the range of their theorising. Social accounting scholars tend to approach the area with concerns and desires for liberation and possibility. Theory can help articulate those concerns and can support and encourage that desire. Above all, the chapter is explicitly partial, speculative and tentative, and it is not *a formal or informed attempt to produce a theory of theories in social accounting. To articulate a range of the possible theories, we offer a simple heuristic through which we may navigate our way through the soup of concepts and perceptions that can blend into a potential infinity of ways of looking and seeing. We hope to encourage diversity and speculation rather than narrowness and alleged certainty.*

1. INTRODUCTION

The purpose of this chapter is principally a pedagogic one: namely to offer a partial and explicitly tentative introduction to a range of theories that are used in and around social accounting. In so doing, we may help scholars develop the quality of their theorising in social accounting.[1] This might seem to be either an unnecessary or a futile exercise: after all, there is an almost infinite array of theories potentially available to social science research in general and social accounting in particular. Indeed, Thomson (2007, pp. 22–23) very usefully identifies 33 *groups* of theories employed in the 'sustainability accounting literature' (sic) as evaluative frameworks. Given this range of potential theories, why might an article that self-consciously examines and (as we shall see later) offers a heuristic categorisation of some of these theoretical approaches be thought useful?

Our intentions are fourfold. *First*, for a student or researcher with no formal theoretical background, becoming familiar with and then seeking out and employing a theoretical frame for their work can be bewildering. This is especially bewildering given this potential diversity of theoretical choice. We hope to ease some of the pain of that process. *Second*, we are conscious of the extent to which our attempts at categorising social accounting theories have been cited and relied on in the social accounting literature (see, e.g., Gray, Owen, & Adams, 1996). Although our categorisation appeared to be useful, it was clearly very limited: the range of possible sources of theorising is very much greater than this. Consequently, this chapter attempts to go some way towards casting a wider net and seeks to stimulate a wider dialogue about theory, theories and theorising in and

around social accounting. *Third*, theory is often used in social accounting in relatively unsubtle ways, and despite the range of theory available, there has been a strange herding tendency, especially around legitimacy theory (for an introduction see, e.g., Deegan, 2002).[2] By trying to open up the issue of theory choice and to provide a simple heuristic to aid such choice, we may be able to offer some small encouragement to the more subtle use of theory and of theorising in the social accounting literature. *Fourth*, theory, as we shall see, serves a range of functions in intellectual life, but perhaps the most important of these – especially within social accounting – are the functions of evaluation and possibility. In effect, the lens of theory enables us to evaluate practice and policy against criteria that we deem appropriate (i.e. our values). The next obvious step is then to consider what forms of practice and policy we consider to be desirable and how we might seek to encourage change in line with our principles. That is, all observations have a normative basis (Tinker, Merino, & Neimark, 1982), and, consequently, the purpose of research is not just to describe the world but also to evaluate it and then to try to change it (to misquote Marx). Concern with social accounting is almost definitionally interwoven with a belief in the need for change; careful choice of theory can probably help us to consider current and potential practice and policy in a more thoughtful and coherent manner.

Although other schools of research might (legitimately) cluster around an approach based on (something approximating to) normal science with a consequent capacity to train new researchers in a specific set of methodologies and research designs (positive accounting theory, market-based accounting research and finance are all examples), such an option is not especially available to social accounting. Yes, there may be a hint of something approaching normal science in (say) the emphasis on content analysis and legitimacy theory, or the whole body of investigations of social/financial performance/disclosure, but more generally, folk approach social accounting with a personal commitment and passion; we are unlikely to approach social accounting and its concerns as a purely intellectual exercise.[3] One cannot easily train a researcher in a linear fashion when the (very proper) motivation is a spiritual, emotional, moral and often incoherent inner drive. Consideration of theory may help to articulate that passion and offer a possible way to harness the 'cool' of the intellect to the 'heat' of the heart and the ambition of the spirit.

The chapter is a long one (for which we apologise) and is organised as follows. Section 2 provides a broad background to social accounting and its diversity. Section 3 explores a number of initial matters in addressing theory. Section 4 introduces how we intend to approach 'theory in social

accounting' and offers the tentative framework we will use to do this. Sections 5–9 then look at different levels of resolution of theories employed in social accounting, respectively; meta-theory, meso-theory and three levels of micro-theory at the inter-organisational, intra-organisational and personal levels of analysis. Section 10 provides a concluding comment. The chapter concludes with a short appendix.

Finally, before proceeding to the following sections, we wish to stress a series of *caveats*. *First*, theory must be enabling, it must open out the world and the possibilities of that world. It should not be used to close down – to become *totalising*, in the jargon. Nothing we say here excludes any theoretical position of itself. *Second*, many researchers succeed without formally theorising, and, instead, they rely on observation: that may well work but, without some understanding of theory, it is difficult (if not impossible) to be aware of perceptual biases and, more especially, what the observations might mean. *Third*, we are *not* experts in theory, nor are we holding ourselves out as having any privileged understanding of theory and theoretical issues. This chapter is built upon a heuristic that we have found useful, and judging by the extent to which colleagues have found earlier articulations of theory helpful, this heuristic may itself prove to have some value – if only as a jumping off point for neophytes.[4] *Fourth*, we have made no attempt to address the considerable literature on the theories of theories – that is beyond our scope or intention here and we explicitly state that we make no claims in this direction. *Fifth*, we are conscious that the material discussed here exhibits a significant bias towards the private sector, developed countries and large organisations. This is a bias that pervades the literature, but it should not remain as implicit as it often is. Theorising should speak to us as much about the public, civil society and non-governmental organisation (NGO)/social enterprise sectors as it does about the private sector; it should sensitise us to the issues in all countries regardless of 'developmental' status and it should help us think about the smallest as well as the largest of organisations (see, e.g., Ball & Seal, 2005; O'Dwyer, 2007; Gray, Dillard, & Spence, 2009).

2. BACKGROUND AND SOCIAL ACCOUNTING DIVERSITY

We have argued elsewhere (see, e.g., Gray et al., 1996) that it is possible to view 'social accounting' as the *universe of all possible accountings* – that is,

social accounting can embrace any possible way in which we can imagine that individuals/groups/organisations might choose to request, give and receive accounts from one another. However, as Owen (2008) remarks, it is not obvious that such an all-embracing definition actually helps us much. Even if we draw our boundaries a little tighter, we will still find that social accounting is a complex, diverse, amorphous and constantly changing craft (see, e.g., Unerman, Bebbington, & O'Dwyer, 2007). Social accounting is not precise or definable, and this imprecision is very likely to remain the case until such time as social accounting is subject to demanding international regulation – and even then evolution may still produce the new and the unexpected.[5] To a considerable extent, it is the voluntary – one might even say wilful – nature of much of social accounting practice that produces the diversity and the lack of any systematic or organised development. And this is something that becomes both more acute and more bothersome when we look at the explanations (the theories) offered for social accounting practice.

It is probably worthwhile to recap some of the sources of that diversity. Put crudely, there is no necessary certainty in social accounting about, inter alia:

- The entity for which we account – it could be an organisation, a group, an individual, a nation, a geographic region, or even a natural resource like water;
- The type of organisations for which we account whether private, public, NGO, social enterprise, large, medium or small;
- The subject matter of the account: employees, sustainability, social responsibility and so on;
- The stakeholders who need to be considered;
- The audience for the account including whether it is a public or private document;
- The content of the account (what is excluded from the account);
- The organisation's motivation for producing a report (including intended impact – whether external or internal);
- The reliability of the account;
- The extent to which the account is governed by law, codes or guidelines;
- The preparer of the report – the accountable organisation or an independent body.

With such a panoply of possibilities, it is no wonder that the range of social accounts we might consider is so broad. And this is just the *formal* accountings – this is an indication of the range of social accounts when we keep to the language of reporting, disclosure and accountants.

Social accounting might be more effective and attractive if it were less formal, perhaps involving deep discussion and exchange of ideas (perhaps even dialogic accounts, see Thomson & Bebbington, 2005; Brown, 2009) or something which involved a much deeper and closer sense of community and connectivity (as Lehman, 1995, 1999, 2001, 2007 has developed in his writing; see also Shearer, 2002; Ball & Seal, 2005; Gray, Bebbington, & Collison, 2006). The universe of all possible (social) accountings is indeed almost infinite.

If social accounting (practice, policy and possibility) is indeed almost infinite, how might we set about trying to explain, interpret and evaluate such practice, policy and possibility? That is the job of theory.

3. AN INITIAL LOOK AT THEORY AND WORLDVIEWS

Theory is a tricky thing. Theory is something we use all the time – but typically implicitly. Cooking a meal, going to the shops, commenting on the football or discussing the behaviour of friends, colleagues or family members all involve theory – although we mostly would not bother to explicitly identify and consider that theory. Theory is, at its simplest, *a conception of the relationship between things*. It refers to a mental state or framework and, as a result, determines, inter alia, how we look at things, how we perceive things,[6] what things we see as being joined to other things and what we see as 'good' and what we see as 'bad'. If we are going to try and explain social accounting practice, make sense of its potential and its impacts (interpret it) and evaluate its effectiveness, we are going to need some theory.[7]

There is a whole body of work related to the philosophy of science on the formation of theory, what makes a good theory and so on (see, e.g., Burrell & Morgan, 1979; Morgan & Smircich, 1980; Borg & Gall, 1989; Laughlin, 1995; Ghauri, Grønhaug, & Kristianslund, 1995; for introductions),[8] but we can be a little more relaxed about such matters here. For social accounting, we need theory to help us think about the world and to help us observe, organise and explain a range of things. These 'things' might include (but not be restricted to) the following: What is (and what is not) social accounting?; Why do organisations undertake (or not) social accounting?; Why do we see the social accounting practice that we do?; Why does that change over time?; What effects does social accounting have?;

What effects could (and should) social accounting have?; What makes a good or a bad social accounting practice? and What problem(s) is social accounting seeking to solve?

Perhaps, the most difficult question is where to start in unravelling our theories. A theoretical framework, in an ideal world, might be required to specify our *worldview* and then, in a coherent fashion, specify the relationships between the item(s) of interest (e.g. social accounting practice) and how they articulate within the worldview. Gladwin, Newburry, and Reiskin (1997) synthesise a range of arguments to identify worldviews as comprising the concepts, values and beliefs which 'powerfully serve to channel attention, filter information, categorize experience, anchor interpretation, orient learning' and so on (p. 245). They go on to argue that much within a worldview is probably tacit, and seeking the sort of coherence we suggest here is almost certainly rare and may, in fact, be illusory. However, that a coherent sense of worldview and theory may be elusive does not necessarily mean its pursuit is worthless. (For more details, see also Gladwin, Kennelly, & Krause, 1995a.)

There seem to be two main reasons why it may be worthwhile to try and pursue some explicit coherence in our understanding of worldviews and theories. First, debate and differences that depend on observable data (e.g. what proportion of multi-national corporations (MNCs) disclose a human rights policy?)[9] are potentially resolvable. However, the more contentious differences (e.g. is social accounting a 'good thing'?) are much more likely to be rooted at the level of theory and worldview. Thus, seeking to expose those differences can encourage a much more intelligent discourse.

The second reason is probably more significant within this chapter. In essence, our theory suggests how we see the world, whether we think of it as 'good' or 'bad' *and* how we might like the world to be. Beyond that, our choice of theory is then a selection to explain the role of items(s) of interest and how we might expose and change those elements that we evaluate as being undesirable.

But a key issue is whether we can actually specify a *worldview*, whether such a specification is essential and whether, indeed, we can derive a coherence in our theorising from our worldview. To give this a broad (but hardly uncontentious) context, Table 1 reproduces the suggestions we made in our earlier work (Gray et al., 1996) about the range of worldviews which might be brought to bear on social accounting. This categorisation is undoubtedly crude, is obviously partial (in that it excludes any religious worldviews for example) but *has* proved surprisingly robust (see, e.g., Buhr & Reiter, 2006).

Table 1. Political or Social Worldview.

- Pristine capitalists
- Expedients/enlightened self-interest
- Social contract
- Social ecologists
- Socialists
- Radical feminists
- Deep ecologists
- Post-modernist

Source: Adapted from Gray, Owen, and Adams, 1996 (pp. 56 et seq.).

This array of worldviews provides us with two dimensions along which we shall speculatively arrange theorisations in social accounting. The first of these dimensions we shall call (drawing from systems theory) the *level of resolution*. That is, the 'bigness' (breadth and inclusiveness) of the worldview: we shall see, for example, that a Marxist view of the world is rather more all-embracing than is usually the case with (say) the 'Expedient' point of view. The second dimension we shall suggest is that of *metaphor*: to what extent might we usefully group theoretical frameworks around a selection of intellectual postures? We develop these in Section 4.

4. SOME THEORY FOR SOCIAL ACCOUNTING?

It is likely that any theoretical framework we might adopt will have elements that are each *positive*, *normative* and *pragmatic*.

The *positive* (i.e. descriptive)[10] elements are those we derive from observation and research: for example, we can observe that the current ways of human organisation are implicated in un-sustainability and that social justice (however defined) and eco-system stability are under serious threat (see, e.g., Millennium Ecosystem Assessment, 2005; WWF, 2008). Such a statement arises from a reading of data and is a *positive* (i.e. descriptive) conception. Additionally, we might observe from research that organisations in general – and large corporations in particular – are not formally held accountable for most of their social and environmental activity.

The *normative* (i.e. explicitly value-laden)[11] elements of any framework are as least as important as the positive elements and are, in all probability, wrapped up with the positive elements. Thus, we might believe that organisations *should* be accountable and that accountability is a *good thing*.

Equally, we might believe that democracy is a *good thing* (and, positively, that accountability is an essential component of democracy), and finally, we might believe strongly that sustainability in the Brundtland sense (United Nations World Commission on Environment and Development, 1987) is also a *good thing*. These are contestable statements of values and, therefore, normative, that is, they are *not* strictly empirical.

Finally, there are likely to be *pragmatic* elements to any framework we choose. For example, we might employ *general systems theory* (GST) even though there is no empirical basis for this: it is a mental way of seeing (a theoretical frame) that appeals intuitively and that proves to be helpful and insightful. This is pragmatic. Equally, as an illustration, our own adoption of a *neo-pluralistic* framework in Gray et al. (1996) was entirely pragmatic (strategic) on the grounds that it is an intellectual place where most political theories can meet and dispute; it is not *totalising* in that it does not close down any voices as far as we can see. Finally, but perhaps more importantly, one may too easily make a pragmatic acceptance that is, in fact, no more than an unsupported assertion. Therefore, for example, we might assume that an accountable democracy is capable of delivering sustainability. Such an acceptance would probably be entirely un-examined (and may be actually quite wrong). This is pragmatic in that one value (the desirability of accountability) is assumed to be complementary with the desirability of sustainability. It may well not be.[12]

These elements can combine to produce a framework within which a piece of research, or even a longer term sense of a project,[13] might sit. The 'theory' such as it is, however, is likely to be both *underspecified* (it does not deal with all and every eventuality nor does it deal with each and every element in the human experience of social accounting and the planet) and *loosely coupled* (in that the linkages between the elements are not all explicated fully). This is a fairly common occurrence with theoretical frames, in that few people (if any) fully understand everything. Theories, typically, as a result are either (i) wide-ranging and consequently underspecified and loosely coupled (like ours) or (ii) are very narrowly focused and, in overcoming our limitations, exclude a considerable range of potentially important elements from the theoretical framework or model. (As we shall see later, these latter qualities are both the strength and the weakness of traditional economic models.) In essence, we tend to assume that theory is always incomplete in the social sciences.[14] More especially, each of the theoretical lenses we are going to introduce now will have insights and understandings to offer but each and every one of them will fail to *fully* explain the phenomena of social accounting that interests us.[15]

With this *caveat* in mind, we will now review some of the theoretical frames that have been used in and around social accounting. To do this, we are going to employ the GST notion of *level of resolution*. That is, problems, issues and solutions vary depending on how widely or narrowly we spread our perception and the range and level of 'things' we allow (or invite) into our perception and, therefore, into our theoretical framing. We will therefore attempt to offer an (albeit crude) organisation of theories by their level of resolution. We do this not to close down or simplify debate – *quite the opposite* – but rather to provide an instrumental pedagogic framework with which to begin this discussion without getting entirely bogged down in theories and theories of theories and so on.[16] To do this, we will engage notions of *meta-theory*, *meso-theory* and *micro-theory*: the three levels at which theory is conveniently thought of as occurring.

Meta-theory concerns 'grand' theory that tries to offer a broad explanation of the major sweeps of influence that structure and are structured by our societies, economies and cultures. *Meso-theory* (or, crudely 'middle' theory) works at a *higher*[17] level of resolution and deals with a more recognisable level of theory wherein we might talk about elements in society, organisations and groupings. Finally, there is *micro-theory* that is focused and specific. We will structure our discussion around meta-theories (systems-level), meso-theories (sub-system-level theories) and three levels of micro-theory (the organisation, internal to the organisation and the individual). As we shall see, these distinctions are far from precise (and can be – and should be – disputed), but they will help us if treated carefully and heuristically. In particular, we hope to tease out why different views of organisation, economic activity and social accounting might arise from different (political, social, moral, cultural or religious) views of the world. And why those differences might matter.

The second heuristic structure we are going to employ is that of *metaphors*. We want to suggest that we can crudely allocate theories to four *dominant metaphors*. We again do this entirely for convenience – if it works for you that is really nice and if it does not please ignore it. These four metaphors are the *biological*, the *political*/*sociological*, the *economic*/*rationalist* and *other* or the *Other* (which we will explain). These four groups of metaphors are derived principally from casual empiricism but are a categorisation that we find persuasive. The *biological* metaphor – of which systems theory itself is an example – is surprisingly common in organisational studies where notions of systems, cells, adaptation and change are common. In terms of the *worldviews* in Table 1, the deep ecologists and, to a lesser extent perhaps, the social ecologists would draw most obviously from

this metaphor. The *political/sociological* category captures those theories that typically deal more explicitly (or at times implicitly) with power, flows and language. This is by far the most populated metaphor (and maybe less helpful as a consequence). In terms of the *worldviews* given in Table 1, this metaphor relates most obviously to the social contract and socialist views. The *economic/rationalist* metaphor is not surprising and is probably the mostly self-explanatory: it relates to a world in which extreme rationalism and the scientific hold sway and is at its most obvious in neo-classical economics, finance and areas such as scientific management. Finally, there is what we have called the 'other/Other' category. This captures both meanings of 'other'. The more obvious and everyday meaning relates simply to the notion that there will be theories that will not fit comfortably into the other three categories and this makes it explicit that this categorisation is partial and underdeveloped. However, the use of 'Other' is intended to refer to a concept (most typically associated with Levinas) of the recognition of the radical difference in 'other' people – the celebration of personality and difference – not of sameness. Elusive though this idea can be, we can tentatively use it to embrace the worldviews of radical feminism and postmodernity (Shearer, 2002).

This is a heuristic: the metaphors are not discrete or immutable but simply helpful. Indeed, there is more than a little overlap in places between, for example, the economic and the political (which separation might be potentially mischievous).

Our basic mental framework is given in Table 2 (which is further illustrated in the appendix). It must be emphasised that the table is a considerable simplification. Furthermore, in its avoidance of many of the principal theories in social science for the last century or so might even be thought trivial. However, it allows us to place some of the theoretical lenses more commonly employed in social accounting into a context, to illustrate where other theoretical insights may be sought, and permits our conversations and thoughts about theory to be explicitly conscious about some of their limitations. With this table, we can now turn to look at meta-level theories.

5. SOCIAL ACCOUNTING AND SYSTEM-LEVEL/META-THEORIES

On the (albeit contestable) basis that we maintain/seek a coherence in our theorisation, our approach to selecting theory will be pre-determined

Table 2. A Tentative and Highly Speculative, *Non-Discrete,* Categorisation of a Selection of Theorisations around Social Accounting.

	Metaphor			
Theory level (of resolution)	Biological	Political/sociological	Economic/rationalist	Other
Meta-theory (system level)	• General systems theory • Deep ecology	• Marxian political economy • Communitarianism • Discourse • Habermas	• Friedman's liberal economics	• Postmodernity
Meso/sub-systems level	• Autopoiesis • (Neo) institutional	• Bourgeois political economy • Social contract • Accountability • Media agenda setting • Cultural conceptions	• Efficient capital markets hypothesis	• Foucault • Radical feminism • Actor-network
Micro I/organisational	• Stakeholder • (Neo) institutional • Resource dependence • Contingency	• Legitimacy • Stakeholder	• Decision usefulness • Signalling • Principal–agent • Transaction costs	• Emerging new conceptions of enterprise
Micro II/internal to organisation	• Autopoiesis • Organisational change (multiple) • Boundary management	• Structuration • Discourse • Group/identity	• Positive accounting • The business case	
Micro III/individual		• Values driven • Motivation	• Principal–agent	• Feminism • Identity

(to some degree at least) by our views about how we believe the world to be and how we would *like* the world to be (O'Dwyer, 2003).[18] There are widely different views on this and deeply held, pre-empirical, notions such as religious and spiritual values; views on the nature of mankind and ecology and beliefs about the purpose of existence, which will all directly and indirectly impinge upon our worldviews.[19] These worldviews will, consequently, have profound influence on how we view, for example, the organisation–society relations and, consequently, the functions (potential and actual) of social accounting.[20] At a minimum, such views are likely to determine with which theorisations we feel intellectually, spiritually and emotionally comfortable. In this section, we begin by briefly reviewing some of the key systems-level/meta-theories, categorised around our four metaphors.[21]

5.1. Biological

The dominant biological metaphor we have tended to employ in previous work is that of systems theory. This meta-theory has little in the way of the political or the economic automatically embedded in it. It does, however, allow us to bring into our conception such systems as we decide are important. Therefore, systems theory directs our attention to the idea that if we think that, for example, economics, business and accounting have anything at all to do with human and non-human systems, then it is the worst sort of reductionism to draw systems boundaries around those bits we might choose to ignore. Societies, organisations, economics, accounting and ecology are all systems and they interact and affect, and are affected by, one another. Simply assuming that an activity is unrelated to societal or environmental desecration does not make it so.[22]

One of the principal contributions of GST is a physical conception of planetary and ecological systems (for much more detail, see Meadows, 2009). It sees integration and self-regulating systems and myriad species and eco-systems interacting with each other. It is the basis of virtually all deep green and radical ecological perceptions. As such, we might view current human interactions as malignant and view modernity itself as a profound failure to live within the principles of ecology and nature. The problems of conflict between ecology and humanity are deep and are almost certainly not solved by the application of more pseudo-modern curatives such as social accounting (see, e.g., Lamberton, 1998; Andrew, 2000). It is this set of concerns that lead us into *deep ecology* and the profound political and

sociological implications that this holds for mankind (see, e.g., Goldblatt, 1996, for an introduction).

5.2. *Political/Sociological*

By far, the most influential of the political/sociological theorisations is the *classical political economy* of Marx. *Political economy* is a useful phrase that considers the way in which power and economic organisations work in a society and the influences that they have.[23] Marx directed our attention to the big picture (the lower level of resolution) to examine the role of the State, the role of capital (investors, management, companies and their supporting structures and institutions) and the role of labour and the bourgeoisie (what we normally think of as the middle classes).[24] In essence, capital held the power, the State was 'captured' by capital and could be expected to do its bidding – aided and abetted by the bourgeoisie. Labour (pretty much the rest of society) was conceptualised as oppressed, and its wealth (the value that labour created through its efforts) was appropriated (stolen, really) by capital. From this perception, injustice, structural conflict and power are essential to any understanding of how society works. Injustice can only be remedied by the removal of power from capital – something which cannot be expected of the State (as it is controlled by capital). It is therefore assumed that such structural change must come, if at all, from labour movements.[25] The ethical foundation of this position – socialism in essence – is that justice is more important than freedom (the liberal economic perception is the opposite of this) and, consequently, nobody in a civilised society should have the 'freedom' to be without basic amenities. The corollary of this is that nobody should have the freedom to be ridiculously wealthy and to control the basic elements through which societies provide for themselves (the 'means of production' in Marx).

Marx's writing has enormous scope and Marx is quite possibly the only really substantial critic and theorist of capitalism itself. It is crucial to note, as a consequence, that one does not need to be a 'Marxist' to be stimulated by the insights offered by Marx. Equally importantly, it is essential to note that the concerns that exercised Marx are not ones which can be solved through marginal adjustment of our present world order – nothing less than complete structural change (of capitalism in his case) can possibly begin to address these issues.

Two other (possible) meta-theory-level conceptions might be worth mentioning at this stage. First, *communitarianism* is an explicitly normative

conception of political organisation with an explicit preference for fairness and locally determined need rather than the more typical socialist preference for equality and egalitarianism (see, e.g., Gray, 1996). There are many shades of the communitarian vision, but in its emphasis on the local, the informal and closeness, it has been developed in considerable detail by Lehman to offer a detailed critique and proposal for a social accounting that moves away from the formal accounts we tend to concentrate upon. In its place, Lehman has articulated a social accounting that might emerge with an emphasis on dialogue and local democracy and that, as a consequence, may offer some salvation for western developed nations (see, e.g., Lehman, 1999, 2001, 2007). Here, we have the beginnings of something like a meta-theory in which social accounting has an explicit place.[26]

The other major conception that may be appropriate here is that of *discourse theory*. This is a theory derived through an appreciation of the central role of language, and it typically embraces a substantial attachment to postmodernism. It seeks to avoid the 'grand narratives' of many meta-theories. Therefore, to consider it a meta-theory may be claiming a little too much. However, discourse theory assumes that 'it is language, signs, images, codes and signifying systems that organise the psyche, society and everyday life. Meaning is socially constructed …' (Friedman & Miles, 2006, p. 69). If, then, language is all, and pre-existing structure elusive or even illusory, then our view of what a society is, what is desirable and what is not, is both constructed by language and entirely understood through it. This can make for an interesting range of questions about whether (for example) our earlier claims of planetary crisis or injustice have any content (see, e.g., Zimmerman, 1994). In turn, as social accounting is itself a manifestation of language (in that accounts are language), it might then be seen as both manifestation of *and* a construction of the society itself. Whether social and environmental accounting (SEA) has any potential for change under this conception is, however, far more speculative.[27]

One notable omission to this point[28] is the absence of a formal consideration of *critical theory*. This is not just 'critical' in the common sense meaning of being critical by seeing the negative side of something. Neither is it just a term we might attach to another group of theories (as we increasingly see with 'critical discourse' theory). No, more substantially critical theory refers to post-Marxist theorising most famously associated with writers such as Marcuse, Adorno, Horkeimer and Habermas (see, e.g., Held, 1980). The potential in these (as in many other) theorists has yet to be fully exploited in social accounting (although see Spence, 2009). One obvious exception is Habermas who is essentially concerned with both

modernity and emancipation. He basically offers us a means to explore how communication within the public sphere can expose and re-make both our understanding of the world and the world itself and, through the notion of discourse ethics, articulates a strongly moral focus which interacts with what we said about discourse theory earlier. In his essentially less radical and more obviously empirical analysis, Habermas has been influential in a great deal of accounting research and, more especially, in social accounting research itself (see, e.g., Unerman & Bennet, 2004; Thielemann, 2000).

5.3. *Economic/Rationalist*

The *economic/rationalist* view might be best typified by *neo-liberal economics* and its most feted exponent, Milton Friedman. At its simplest, the liberal economic democratic conception envisages a world of equal individuals, free to act (liberal)[29] and to express choice through actions in markets (economic) and actions in the political arena (democratic). (At this level of resolution, the distinction between the economic and the political barely holds up.) In the idealised form, the State (the government and its organs and institutional structures) is presumed to be small, to act to maintain freedom and, most importantly, to be *neutral* with respect to serving particular group's interests.[30] The liberal economic democracy conception is both a *positive* conception (i.e. an attempted description of how the world *is* presumed to be) and a *normative* conception (i.e. a conception of how the world *should be*).[31] The essence is that the individual's freedom is paramount, that we all come to economic exchange equally able and free to express our personal economic choices. For those choices that cannot be expressed through economic exchange, we are presumed to be able to express them either through individual or group social action or through exercising equal power through the ballot box or other political action. As power (the ability to influence others) is assumed to be equally distributed, no one individual or group can systematically dominate (or impose their preference upon) any other.

The claimed analytical power of the liberal economic democratic conception develops when each agent is presumed to be acting in their own self-interest. The sum total of all these individual social, political and, especially, economic actions of self-interested individuals does, it is claimed, produce maximum economic efficiency unfettered by social and political interference. The self-interested pursuit of economic efficiency seeks out the 'best' economic choices and ensures that finance, labour, know-how,

physical capital and materials are put to the 'best' economic uses. As a result, it is claimed, this generates maximum profits and economic growth (through maximum efficient output from scarce resources). Thus, it is concluded, an economy that is generating more (financial) wealth must also make society better off and thus make everyone within that society better off. Minor inequalities arise either through choice (e.g. leisure versus work) or can be eroded through political action (e.g. pressure groups of the disadvantaged).[32]

Finally, this pen-picture[33] of liberal economic democracy has avoided any explicit reference to emotive things such as ethics and morals. This is because embedded, implicitly, in the assumed workings of liberal economic democracy is a version of the ethic of *utilitarianism*. This ethic states that every action should be judged by the consequences of that action and, in particular, by reference to the economic consequences to the agent – the change in his/her utility. In the liberal economy of recent history, this utility is to be measured by cash flows, profit and gross national product (GNP), and thus, the consequences (and thus the 'rightness') of an action are captured in profit. A profitable action is thus a good action.

5.4. Other[34]

Whether we should consider *postmodernity* as offering a meta-theory or not is unclear. Postmodernity is not a simple – or indeed a single – perspective and would typically reject the 'grand narrative' offered by (especially) Marxian views and, rather, would express itself in terms of the failures of modernity (many of whose characteristics also exercise the radical feminists and the deep ecologists). A postmodernist view would also, typically, reject much of the structure and paraphernalia of modern (mostly) western life. Typically associated by scholars in the business, management and accounting literature with theorists such as Derrida, Lyotard, Baudrillard, Rorty and, especially, Foucault, the diversity represented here ranges from the profoundly radical to the potentially very conservative (see, e.g., Zimmerman, 1994, for a discussion of this point in an ecological context). Although postmodernism itself does not directly help us to develop social accounting at this stage of the proceedings, it does challenge how we might think of 'social accountings'. Postmodernism offers a fundamental critique of modernity, and, in doing so, it significantly adds to the challenges that social accounting must address (see, e.g., Everett, 2004; Gray, in press).

The *radical feminist* worldview is also certainly not singular (in any sense). Its essence here is that our economic, social, political and business systems – and thus the language of business and accounting – are essentially 'masculine' constructs that emphasise, for example, aggression, traditional success, achievement, conflict and competition. Our world thus denies a proper voice to, for example, compassion, love, reflection, cooperation and other 'feminine' values. Once again, whether this might be seen as a meta-theory is perhaps questionable, but in seeking a balance, an integration of thinking and reasoning with intuition and feeling; a balancing of doing with contemplation; a blending of material concerns with spiritual realization; a dilution of the respect for analysis, discourse and argument with a love of silence (to paraphrase Hines, 1992, p. 337), a radical feminist would approach the world and the notion of knowing it in an entirely different way from the other approaches we touch upon earlier. (And would almost certainly challenge this 'masculine' attempt to organise and categorise, see Shearer, 2002.)

One of the major issues of significance to us at this stage is that none of these meta-theories has anything to say directly about social accounting. Indeed to the extent that the adherents of the meta-theories have considered social accounting, they would consider that social accounting must do more harm than good. Indeed, a Marxist, pristine capitalist and radical feminist might all agree that we should expect social accounting to be bland and designed to legitimate the system of capitalism/masculism/modernism as a whole: that is, such accounts would be intended to persuade us that capital/males were acting responsibly and that it was controlled by the State on behalf of the demos (see, e.g., Tinker, Lehman, & Neimark, 1991; Tinker & Gray, 2003). For the pristine capitalist, any social accounting that was not directly aimed at profit seeking and economic efficiency would be an undesirable distraction in the well-oiled machinery of capitalism. Such a distraction would reduce capitalism's efficacy in delivering maximum social welfare through maximum economic growth (see, e.g., Benston, 1982a, 1982b, but see also Shearer, 2002). For the systems theorist, the situation is less clear and would depend on what other elements – and especially human values – were permitted into the analysis. Certainly for a deep ecologist, it is entirely unlikely that formal accounting (as we normally consider it) would be recognised as a desirable element of a deep ecology utopia.

In brief, then, our choice of meta-theory can be assumed to reflect our worldview. (Whether or not the worldview can be assumed to be chosen in a disinterested and informed way is quite another matter.) Although that worldview is unlikely to have anything directly to say about social

accounting, it is highly likely to have implications for some or all of responsibility, information, communication, justice, organisations, power, systems, accountability and so on. In so doing, the worldview provides a frame within which our *meso-theories* gain credence and coherence. Each of our foci in research thinking and policy-making might be thought to have a reflexive relationship with the theories 'above it' (the meta-theories) and those 'below it' (the micro-theories). Any choice of theory about aspects of social accounting might, therefore, be assumed to ultimately reflect the worldview of the person concerned.

6. INCREASING RESOLUTION – SUB-SYSTEM-LEVEL/MESO-THEORIES

A major problem that besets much discussion in management, business and accounting is that the meta-theory level is typically excluded from the discussion. (See, especially Chwastiak, 1996, for a stimulating example of this phenomenon.) We find time and time again that, for example, the sustainability of corporations is debated in the absence of any discussion of the sustainability of the planet; the responsibility of organisations is debated in the absence of any discussion of the responsibility of capitalism; claims to serve the public interest do not ground their claims in any notion of society or justice and so on. As a consequence, most theorising about corporations – and, it then follows, about social accounting – too often only starts at (what we have called in Table 2) the 'sub-systems level'.[35]

Now the most interesting thing about 'sub-system-level' theories is whether or not their proponents think of them as embracing the system level or whether they recognise that they are considering only a sub-set of the system. This is classically illustrated in the central and ancient political notion of the social contract and bourgeois political economy (which we consider later) where, for example, the distribution of power is examined without considering how that distribution came about in the first place and is now maintained – that is, without considering the meta-theoretical level.

6.1. Biological

As many theories can be employed at different levels of resolution, our locating them at any point in Table 2 may well be a little arbitrary. (Notably, we will consider *(neo) institutional theory* in Section 7.1.)

Arbitrary categorisation is illustrated well by the theory of *autopoiesis*, which is another biological metaphor that can be used at individual, organisational or systems levels. Autopoiesis as it is applied to social science is most usually associated with Luhmann (1989) and was introduced to the accounting literature by Power (1994). At the risk of over-simplification, autopoiesis can be thought of as a property of systems whereby they only permit into their architecture those elements that 'code' with the system itself: intrusions (or threats) that are not recognised by the system – which do not 'code' to the system – will be rejected. (The parallel with cell biology is fairly obvious as a cell's immune system learns to reject alien bodies but accepts what it recognises as benign elements.) Autopoiesis is an elegant metaphor for the way in which systems (of, e.g., information flow, disclosure, corporate behaviour, financial markets or whatever) will 'reject' any invasion or other development which does not accord with the design archetype of the system itself. Consequently, we can hypothesise that any social accounting that might be seen as a threat to (say) capitalism will be rejected by it, and only social accounting that 'codes' to the system will be accepted by the system.[36] Such a conception offers us a useful explanation of the way in which (for example) serious accountability and sustainability reporting is rejected by western economies.

6.2. *Political/Sociological*

The most common theorisations about corporations in general and social accounting in particular adopt (often unwittingly) a 'bourgeois' political economy.[37] Whereas, as we saw, classical political economy places structural conflict, inequality and the role of the State at the heart of the analysis, *bourgeois political economy* tends to take the 'status quo' as given and thus excludes them from the analysis. As a result, the bourgeois political economists tend to be concerned with interactions between groups in an essentially pluralistic world (e.g., the negotiation between a company and an environmental pressure group, or between a local authority and the State). Although this produces useful analysis, it does, according to the classical political economists, entirely miss the more important point of how those relative differences in power, wealth and so on were generated and maintained by the system in the first place. In essence, what happens with a bourgeois political economic viewpoint is that we examine social accounting when it is (say) legitimating specific elements of the system, of a company, of an industry or of a practice (say) and thereby fail to see that the issue being

legitimated is actually systemic: the issue under consideration is a direct consequence of the system within which it arises. This would mean that when studies throw up 'irresponsible' behaviour by a corporation, such as Union Carbide, Exxon, BP, Premier Oil, Nike, Nestle or whoever, the only thing of real interest to a classical political economist is not that such behaviour took place but simply that they got caught. The behaviour itself is expected from a system (like capitalism) under which irresponsibility is, it can be argued, encouraged.

Bourgeois political economy provides us with a sub-system-level context within which most of the theories we are going to briefly review are typically located. Its relatively restricted perspective allows us to focus on theories that tell us more about – or at least give us more direct insights into – social accounting.

The *social contract* is most usually associated with 17th- and 18th-century writers such as Hobbes and Rousseau. It considers that, in essence, each individual undertakes to contract with society for the benefit they derive from being part of that society – defence, laws, mutual support and so on. More formally (as Tozer & Hamilton, 2007, p. 108, put it), the contract is derived between those who are empowered (typically the government) and those who grant that power (by election, abstention or submission). From this then arises the frequently stated position that an organisation exists at the will of a society to the extent that it continues to provide society with benefits. This in turn brings us to an analysis of rights and responsibilities (see, e.g., Donaldson, 1988), which, in turn, leads into the conception of *accountability* that is widely employed in social accounting (see, e.g., Gray et al., 2006). Accountability seeks to emphasise the relationships between (typically) organisations and parties (see Section 7.1) and, recognising that accountability is a *sine qua non* of *democracy*, explores the information and channels through which a democratic society would hold its organisations to account. Much of the use of accountability in social accounting echoes the social contract although accountability allows us to ask how the rights, responsibilities and accountabilities are established and maintained (see, e.g., Mathews, 1993; Tozer & Hamilton, 2007; Dillard, Brown, & Marshall, 2005).

Media agenda setting theory was introduced to the literature by Craig Deegan (see, e.g., Brown & Deegan, 1998) and it focuses our attention on the way in which issues are constructed through popular culture in general and the media in particular. Put simply, there is always pollution, but pollution is only recognised as an issue worthy of attention (and corporations only then respond) when the (largely corporate-owned) media

finds out and is able and willing to make a fuss about it. (In a sense that echoes discourse theory, 'pollution' does not socially exist until it is defined, managed and communicated by the media). One of the ways in which a company, a series of companies and an industry might respond (and by which we might, therefore, learn about what affects organisations) is through their voluntary disclosure. The systemic production of issues (such as pollution and injustice) plus the way in which a society comes to rely on a media to inform it about substantive matters is something on which the meta-theory would have something to say. A classical political economy would direct us to how those issues are created and manipulated whereas media agenda setting theory would look at how the issue was then re-constructed, managed and manipulated through media and organisational interaction.

A related concern for context is offered by, for example, Adams (2002), Perera (2007), Mathews and Perera (1991), and Hanafi and Cooke (2005) who direct our attention to *culture* as a key systemic variable that will influence social accounting practice. We already know that things like size of the organisation and the profile of the industry in which it operates have a major impact on an organisation's predisposition to formally disclose (see, e.g., Murray, Sinclair, Power, & Gray, 2006). What culture captures is a range of important aspects such as attitudes to disclosure, attitudes to the accountability of organisations, the expectations and reactions of civil society and the likely response by the organs of the State. Our theories of why social accounting does (or does not) take place, the form it takes and its regulation are, therefore, going to be clearly culturally dependent, and in the same way that an understanding of culture has helped understand organisations and indeed accounting practice (see, e.g., Hofstede, 1984; McSweeney, 2002), it will also add to our understanding of social accounting (see also Adams, Hill, & Roberts, 1995b). Indeed, Islam, for example, has frequently been cited as a major influence on disclosure regimes in a number of countries[38] (see, e.g., Belal & Owen, 2007; Kamla, Gallhofer, & Haslam, 2006; Hanafi & Gray, 2005).

6.3. *Economic/Rationalist*

There are many sub-systems-level theories within neo-classical economics. Few of these are *explicitly* employed in social accounting, but one exception is the *Efficient Capital Market Hypothesis* (ECMH). The ECMH (and the variants that surround it, see, e.g., Belkaoui, 1997; Hines, 1984) operates at

the level of financial markets[39] and suggests that (typically) the prices of shares in stock markets respond rapidly and unbiasedly to new information. The constraints of the theory are clear: it looks at economic actors in a specific (but exceptionally) powerful sub-system of the society. The theory operates around the fascinating tautology that information is that which affects share prices; that which does not affect share prices is not 'information' and any reaction to 'non-information' is itself irrational (see, e.g., Hines, 1984). Therefore, we can study social accounting and discover whether or not it has 'information content' to actors in the stock market and, from there, infer whether investors do or do not interest themselves in social accounting data.[40] Generally speaking, we find that investors who are pursuing their own wealth and self-interest are generally disinterested in social accounting unless it relates to risk and future earnings.[41]

6.4. Other

We briefly considered radical feminism earlier and so will not revisit it here in-depth. However, there is neat link from *Other* perspectives back to accountability through, most especially, Shearer (2002). Shearer articulates an accountability deeply embedded in feminist perspectives of intersubjective relationships and, in so doing, not only warns us of the dangers and limitations of economic theory but also offers us a more context-sensitive and ethically explicit approach to the interpretation of giving and receiving accounts (see also Dillard, 2007, for an important development of this idea).

Placing *Foucault* anywhere in Table 2 would be a challenge and synthesising his work in a few words even more so. He is one of the 20th century's most influential thinkers, and his work is foundational throughout management academe and (perhaps to a lesser extent) in accounting (and especially accounting history) but as yet remains relatively under-used in social accounting (although see Everett & Neu, 2000; Lehman, 2006). The essence of Foucault's work relates to forms of knowledge, discipline and power, and (what he calls) the practices of the self. Broadly speaking, whether we are concerned to understand the resistance that social accounting can offer, the difficulties we face engaging with modernity and/or the postmodern critique of 'conventional' social accounting approaches, there is much yet to be drawn from Foucault's work.

Other theorising that is beginning to influence thinking in and around social accounting is that of *Actor Network Theory* (ANT). This is an increasingly complex (and possibly elusive) theoretical conception that has

at its heart a simple idea: that our conception of issues, problems and sites of research enquiry should be based around the notion of dynamic and interacting networks. At this level, it looks a lot like a child of GST but the key to ANT is its claim for the heterogeneous nature of networks that contain many dissimilar elements. With its attachment to ethnomethodology, ANT then distinguishes itself from other theories employing networks in that an actor-network contains people, objects, ideas and organizations: collectively known as actors or actants, this articulation of ideas and things gives the theory its label of 'material-semiotic' (Knights & Willmott, 2007, p. 428). Callon (one of the pioneers of ANT) argues that a key factor is the 'radical indeterminacy of the actor' – that is, that who/what are actants and characteristics of the actants are in no sense predetermined (Callon & Law, 1997). Networks are transient and maintained through constant performance of the relationship between the actants and hold out the potential to make visible the infrastructure within which events and actions take place. Therefore, Callon (2009) explores the emergence of carbon markets through the lens of ANT, and Lukka (2004) identified journals as 'networks of actants'. Placing social accounting – whether as a technology or a semiotic category – within ANT could suggest a range of potentially nuanced articulations of, for example, the processes of current social disclosure or the capture and appropriation of social responsibility and sustainability through actor-networks of which social accounting was one relation.

At a very general level of analysis, we can perhaps see that these subsystems theories relate to social accounting in terms of the emergent properties of social accounting as well as the functions that social accounting might be expected to serve and (to the extent that the system is purposive) how the system might use social accounting for its own ends. However, by far, the greatest volume of research and theorising around social accounting occurs, not at the level of the system or even at the subsystem level but at the level of the organisation itself and, generally, seeks to answer questions about why organisations do (or do not) produce social, environmental and sustainability disclosures.

7. MICRO-LEVEL/THEORIES OF SOCIAL ACCOUNTING AND ORGANISATIONS

For some time now, the theories most widely employed in the social accounting literature have involved constrained conceptions of the

'organisation' and its interactions with a (usually partially defined) substantive environment. It will come as no surprise to find that the theories at this level also are not neatly accommodated by our four metaphors (as might be suggested by Table 2) and that they, in particular, will often combine elements of the biological, the social/political, the economic and (to somewhat lesser extent) the Other.

7.1. Biological

Stakeholder theory (along with legitimacy theory – see Section 7.2) has been one of the most widely employed theories in the social accounting literature at this level of resolution.[42] *Stakeholder theory*[43] could be located quite easily under either the political metaphor (mainly as a result of its link with the social contract) or the rationalist metaphor (as a result of its rational management link – see later), but we find it most valuable as a more organic – and hence biological – metaphor. A 'stakeholder' of an organisation is any human agency that can be influenced by, or can itself influence, the activities of the organisation in question (see, in particular, Freeman 1984, 1994). An organisation therefore has very many stakeholders including as diverse a range as employees, management, communities, society, the state, future generations and non-human life.[44] It is, thus, an explicitly systems-based view of the organisation and its environment. And it is a view that recognises the dynamic and complex nature of the interplay between the organisation and its environment. There are two major variants of stakeholder theory, and this general perception applies to both.

The first variant of stakeholder theory relates directly to the accountability model we have employed elsewhere (Gray et al., 1996) and perceives the organisation–stakeholder interplay as a series of socially grounded relationships that involve responsibility and accountability. Thus, the organisation owes an accountability to all its stakeholders. The nature of that accountability is determined by the relationship(s) of that stakeholder with the organisation. Thus, to all intents and purposes, this is the *normative* approach to accountability. It has little descriptive or explanatory power in a social accounting context (Gray et al., 1997).

The second variant of stakeholder theory relates more closely to Tricker's (1983) concern over *empirical accountability*. That is, stakeholder theory may be employed in a strictly organisation-centred way. Here, the stakeholders are identified *by the organisation of concern* (and not by society as they would be in the accountability framework), by reference to the extent

to which the organisation believes the group needs to be managed to further the interests of the organisation (what Mitchell, Agle, & Wood, 1997; call 'salience'). The more important (salient) the stakeholder to the organisation, the more effort that will be exerted in managing that relationship. Information – including financial accounting and social accounting – is a major element that can be deployed by the organisation to manage (or manipulate) the stakeholder to gain their support and approval (or to distract their opposition and disapproval). It is quite possible to interpret a proportion of social accounting and disclosure as commensurate with an organisation operating in accordance with stakeholder theory. Furthermore, stakeholder theory encourages us to interpret examples of voluntarily disclosed social accounting as indicative of which stakeholders matter most to an organisation and, thus, those which the organisation may be seeking to influence (Roberts, 1992; Mitchell et al., 1997).

Dissatisfaction with many of the more popular theories in social accounting has led to a growing interest in *institutional* (or more properly *neo-* or *new institutional*) *theory* as a promising alternative theoretical frame.[45] Institutional theory is most typically associated with Di Maggio and Powell (1983) and Scott (2004). It concerns itself with organisations and *organisational fields*. The initial and key insights offered by the theory derive from this context offered by the notion of organisational fields that comprise 'both cultural and network systems *[which give]* rise to a socially constructed arena within which diverse, interdependent organizations carry out specialized functions. It is within such fields that institutional forces have their strongest effects and, hence, are most readily examined' (Scott, 2004, p. 7). Fields are thus socially constructed space arising from interactions, shared interests, common concerns, joint activities and so on. Larrinaga-González (2007) identifies a number of such spaces in the area of social accounting including the Global Reporting Initiative and the Environmental Audit and Management Scheme. The process of *institutionalisation* is primarily a process of homogenisation – or *isomorphism* – in which organisations converge in their behaviours to give a field stability and (eventually) inertia. Broadly speaking, this process of institutionalisation is presumed to occur through a combination of *coercion* (e.g. regulations, laws or major market changes), *normative* mechanisms (shared and converging values through, e.g., education or professionalisation) and *mimetic* mechanisms (typically imitation of behaviours that appear to be successful). From such perspective, one will be able to explain part of social accounting behaviour through a combination of (say) increasingly shared values

(about, e.g., the capacity and responsibility of organisations) and a mimetic tendency to imitate others in the field (Larrinaga-González, 2007; Bansal & Roth, 2000).[46]

Institutional theory has a close relationship with both stakeholder theory (where the web of stakeholders and their interactions and relative strengths might be thought of as fields) and legitimacy theory (which Larrinaga-González, 2007, argues is a special case of institutional theory). Institutional theory also has direct relationships with theories such as *resource dependency theory* (RDT).[47] RDT is not yet widely used in social accounting but is one of a family of theories used in organisational studies that illustrates the almost infinite variety of conceptions we might bring to our study of organisational behaviour. RDT is a derivation of systems theory and a close relation of contingency theory (see later) and maintains a dynamic relationship between an organisation and its dependency on (and hence vulnerability to) unpredictable resource supplies. Uncertainty and hostility are key components of the organisation's environment. Consequently, the demands placed upon it by agents who control the key supplies are a major explanation of organisational choice and action. The resources upon which an organisation is dependent need not be only finance, labour, supplies, markets and so on but also include legitimacy, reputation and so on (Deegan, 2002). The potential for a disclosure regime (and thus the use of social accounting) to operate in such a climate is obvious.

Other theories offer potential organisational-level insights into social accounting but (like RDT) are currently less widely employed in the literature. So, for example, *contingency theory* posits that any organisation, to function well, will adopt the structures, postures, missions, activities and suchlike that best fit its environment and circumstances.[48] Thus, there is no single, ideal type of organisation and organisation structure. Neither will there be (say) any single ideal position on social responsibility or any single ideal system of information flows and disclosure regimes. The best for the organisation will depend on its circumstances (Otley, 1980; Thomas, 1986). It would be possible to suggest that social responsibility and social accounting may be *contingent variables* – that is, variables that are dependent on key environmental and organisational factors (see, e.g., Adams, 2002). Indeed, there is a whole body of literature that explores the association between organisational factors and matters such as political exposure, industry affiliation and company size, and this literature can be thought of as having a link to contingency theory (see, e.g., Husted, 2000; see also Gray, Javad, Power, & Sinclair, 2001).[49]

7.2. Political/Sociological

Legitimacy theory's extensive use in social accounting is widely remarked upon (Patten, 1992; Guthrie & Parker, 1989; Lindblom, 1993; Deegan, 2002). Legitimacy theory basically takes the second variant of stakeholder theory mentioned earlier and adds conflict and dissension to the picture. At its simplest, the theory argues that organisations can only continue to exist if the society in which they are based perceives the organisation to be operating to a value system that is commensurate with the society's own value system (i.e. if they are perceived as legitimate by the 'relevant publics'). Organisations can face many threats to their legitimacy (e.g. a serious accident, a major pollution leak or a financial scandal) and in consequence may employ broad *legitimation strategies* to counter that threat. Lindblom (1993) identifies four such strategies: 'educate' its stakeholders; change the stakeholders' perceptions of the issue; distract (i.e. manipulate) attention away from the issue of concern or seek to change external expectations about its performance.

Legitimacy theory, in this general form, offers important insights into social accounting practice. Many major social accounting initiatives can be traced back to one or more of Lindblom's suggested legitimation strategies. For example, the general tendency for social and environmental disclosure to emphasise the positive points of organisational behaviour, rather than the negative elements, may be explained as commensurate with a legitimation action on the part of the organisation (Deegan, 2002, 2007; O'Donovan, 2002).

But legitimacy theory also has two principal variants. The first tends to be concerned with the legitimacy of individual organisations – for example, a company that is involved in a major oil spill or a charity caught up in a financial scandal may find its legitimacy threatened. Understanding such events and how they are (and can be) managed has a great deal more potential than is yet always fully exploited in the social accounting literature, and although one can find many illustrations of where social accounting is employed to close a 'legitimacy gap' (Lindblom, 1993), the forms of legitimacy, the relevant publics from whom support is sought and the elements of which legitimacy might be thought to comprise offer considerable further analysis (see, e.g., Suchman, 1995; O'Donovan, 2002).

The second variant of legitimacy theory, however, takes a wider perspective (a lower level of resolution). This wider perspective, principally informed by Marxian thinking, raises questions about the legitimacy of the *system* (e.g. capitalism) as a whole. Such a perspective might lead one to ask,

for example, why shareholders have the dominant role in external information provision, or why companies are permitted to act in ways that most individuals would find unacceptable in their private lives.[50] Under this perspective, social accounting is more subtly employed. It might be used by a range of organisations[51] to (say) either 'explain' about changing organisation–employee relationships that may look, on the surface, like an attempt to educate stakeholders, but that might be interpreted as an attempt to cover moves towards the emasculation of trade unions. Similarly, we can see trends in (especially) sustainability disclosure which can be interpreted as attempts to maintain public perception of the importance of a company, an industry and a system in the 'creation' of 'wealth' and 'jobs'. Such uses of social accounting can be interpreted as attempts to continue the legitimacy of the system rather than of individual organisations.[52] None of this, however, really tells us very much about why organisations might choose *not* to disclose at all or to necessarily tell us why disclosure might be so selective.

7.3. Economic/Rationalist

That stalwart of accounting theorisation – *decision-usefulness* – has also been used to help explain social accounting. This theory simply suggests that information (such as social accounting) will be produced if appropriate decision-makers find it useful in their decisions. The theory is a useful heuristic, but it fails to expose which decision-makers concern us and why – and, consequently, the theory concerns itself with the powerful decision-makers such as management and investors and thereby implicitly ignores most other decision-makers. However, the theory is also confused over the *normative* and the *positive*. As a descriptive theory, it does not help a great deal in the sense that almost anything can be useful. (A teaspoon is useful in digging a hole if that is all you have.) On the contrary, it does not tell us who *should* receive information (investors are assumed but not justified in the theory), and therefore, it ducks the normative question (which is why accountability works so well in this vein). Therefore, we can study social accounting and discover that investors and financial participants in companies find social information 'quite useful' information (see, e.g., Firth, 1978; Epstein & Freedman, 1994), but such information tends only to be central to a minority of 'ethical investors'. How social information would influence all the decisions of all corporate stakeholders if it were complete, direct and fairly stark is entirely another matter and remains largely untested (see, e.g., Guthrie & Parker, 1989; Milne & Chan, 1999; Chan & Milne, 1999).

One interesting variant on decision usefulness, however, is caught by the notion of *signalling*. There is a growing awareness that management might produce social accounting as a signal to (primarily) their financial stakeholders that they are keeping an eye on, for example, social and environmental risks, and, consequently, the investors can assume that the organisation is both well run and relatively free from unexpected social (de-legitimating) shocks. This would certainly go someway towards explaining why so many organisations would produce largely vacuous stand-alone reports – they are not directed at informed members of civil society but are intended for management, investors and the media as a signal of the organisation's competence (Neu, Warsame, & Pedwell, 1998).

Agency (or *principal–agent*) *theory* is both an exceptionally closely focused theory and an exceptionally popular one. It conceives of the world as comprising pairs of individuals – a principal and an agent – who contract together under assumptions of short-termism, utter selfishness and utility maximisation.[53] The principal (e.g. a manager or a shareholder) seeks to induce the agent (e.g. an employee or a director of the shareholder's firm) to do things that are in the best interest of the principal and thereby overcomes the agent's own preferences (known as 'moral hazard') and any likelihood of the agent to make the wrong choice ('adverse selection'). The principal achieves this through monitoring the agent (typically through information) and offering financial inducements for correct behaviour. The theory can be most comfortably employed at the personal level, but following Jensen and Meckling's (1976) argument that the firm is no more than a 'nexus of contracts', it is now widely applied at the organisational level. The theory is used to model manager–employee behaviour and company management–stockholder/market relationships and used, for example, to explain incentives and control.[54] The direct use of agency theory in social accounting is relatively scarce (although see Ness & Mirza, 1991, for one exception) although its underlying assumptions and reasoning are widely used in the statistical analyses of social accounting disclosure which, typically, might be concerned with isolating and understanding investor-relevant financial effects. Broadly, investors seem relatively uninterested in social accounting information (see, e.g., Chan & Milne, 1999). Agency theory is relatively unpopular in mainstream social accounting largely because something as individualistic and self-serving as agency theory sits uncomfortably with the more expansive, liberationist and even emancipatory ethical basis that most bring to social accounting.

Equally, social accounting has not yet fully embraced the potential of institutional economics, markets and hierarchies and, particularly,

transaction cost theory (see, e.g., Williamson, 1979). This branch of theory begins from an explanation as to why organisations exist – mainly because it costs too much to transact each and every action in the market place, and therefore, these actions are more easily and efficiently undertaken *within* an organisational setting. In doing so, organisations (it is argued) are able to overcome problems of transaction terms between agents who must all have imperfect information. This, in turn, leads organisations to be able to more easily overcome difficulties in maintaining reliability and quality in goods and services. (The trend towards outsourcing is a reverse of this process.) MNCs can then be seen as massive mechanisms for minimising transactions costs worldwide (see also Korten, 1995; Agmon, 2003). The role that social accounting might play in such a conception is not immediately obvious, but we might see social accounting used internally in the organisation to maintain culture and ease internal transaction costs while the larger organisations can employ disclosure to influence their negotiations (and therefore their transactions) over cost, regulations and market advantages.

7.4. Other

It is not at all obvious that social accounting literature has yet embraced the Other at an organisational level, but there does exist a wide range of *new conceptions of organisational life* and an associated imagining of social accounting. As humanity (again?) seeks to imagine what an organisation which embraced nature and sustainability might look like; how a commercial organisation might embed itself and reflect its community and how we might reverse the homogenisation that financial organisational life seems to demand, new possibilities emerge. We are familiar with many of these in the non-profit sector, in social enterprises, fair-trade and 'value-based' corporations and cooperatives, but yet, other forms of organisation that respect the other and that embrace many of the criticisms of modernity will need to be (re-)discovered especially in the developed west (see, e.g., Young & Tilley, 2006; Gladwin, Krause, & Kennelly, 1995b; Johnson & Bröms, 2000; Dauncey, 1996). New approaches to social accounting are edging towards these new possibilities (see, e.g., Dey, 2007; Evans, 2000; Gray et al., 1997; Cooper, Taylor, Smith, & Catchpowle, 2005).

One thing that unites most (if not all) of the theories considered in this section is that they are under-specified, they really do not explain 'why' organisations do what they do regarding corporate social responsibility (CSR) and social accounting in any consistently thorough or

convincing way. They are, in fact, outside-looking-in theories – theories that observe organisations from the outside and speculate on what is happening. Much more penetration on the detail of what organisations are doing is acquired through the inside-looking-in theories – theories that derive from field work research conducted inside the organisation itself.

8. SOCIAL ACCOUNTING INSIDE THE ORGANISATION (MICRO THEORY II)

Although there has always been fieldwork-based enquiry[55] in social accounting, by the turn of the century, it had not dominated research to the same extent as had the more arms-length enquiries such as the study of organisation's disclosure or even the use of postal questionnaires.[56] Consequently, theorisation about social accounting within the organisation – how it comes about, why it happens, why it does not happen, why it takes the form that it does and so on – had been relatively less well developed. Given the considerable volume of management and management accounting theorisation based, primarily, on field work, this is actually a bit of a surprise (see, e.g., Knights & Willmott, 2007; Emmanuel & Otley, 1985; Puxty, 1988).

There is currently no dominant organisational theory of (or for) social accounting inside the organisation. There are, however, a number of themes that seem to stand out – regardless of the theory employed.[57] For example, research continues to show the diversity and complexity of both individual and organisational motivation for social accounting. Although there may well be times when social accounting might be undertaken for a simple, singular direct reason, it would be contestable to assume this was always the case.[58] Additionally, studies increasingly identify the importance of the role of key individuals in the developing of social accounting as well as the problems that an individual might experience in the conflict between personal and organisational values regarding social (non)disclosure (Antal, 1985; Jones, 1986; Gray et al., 1997, 1998; Buhr, 1998, 2007; De Villiers, 1999; Gray & Bebbington, 2000; Adams, 2002; Miles, Hammond, & Friedman, 2002; Norris & O'Dwyer, 2004; Rahaman, Lawrence, & Roper, 2004; Dey, 2007).

8.1. Biological

We can revisit *autopoiesis* at a higher level of resolution. As an illustration, research has shown that within commercial organisations, the need for any

activity such as social accounting to meet a broad 'business case' is paramount. Although any 'business case' extends beyond a simple economic/financial calculus (see later), it seems to be the case that any initiative concerning social, environmental or sustainability accounting and reporting must be stated in tune with (must 'code' to in the autopoietic sense) the overall (economic) mission of the organisation itself.

One major area of theorising over social accounting within the organisation relates to models of *organisational* change. For example, Gray, Bebbington, Walters, and Thomson (1995a) employed an adapted form of Laughlin's (1991) model of organisational change to provide a framework within which to study the emergence of social accounting in a number of institutions (see also Larrinaga-González, Carrasco-Fenech, Caro-González, Correa-Ruiz, & Páez-Sandubete, 2001; Larrinaga-Gonzalez & Bebbington, 2001). In a manner similar to the discussion of autopoiesis, the study found that while environmental accounting (in that case) was both a result of external pressures and a potential source of change itself, the range of influences that the organisation 'recognised' and responded to was limited to those that accorded with the design archetype of the organisation. The model was further extended to embrace Llewellyn's (1994) approach to organisational *boundary management*. That model suggests that issues (such as the natural environment, climate change or social responsibility) will, to a degree at least, be absorbed by the organisation and that the organisation will extend its boundaries to embrace 'outside' issues. That is, organisations can be said to 'manage' the boundaries of their entity and to determine what is and what is not absorbed or recognised by it – in effect, what is or is not 'part' of the organisation and consequently part of the business of the organisation. Social and environmental issues and the management of and accounting for them is just such an issue and will be embraced, absorbed or rejected to the extent that it seems to be in accord with the organisation and its sense of itself.

8.2. Political/Sociological

An influential illustration of how to approach the use of theory is offered by the intensive case study of Buhr (1998). Buhr employs a range of theoretical lenses through which to explore how issues (such as pollution or social accounting) actually emerge as issues within organisations. The article concludes that the dominance of engineers in the company leads to a predominantly technological approach to both solutions and explanations

of the issues (in this case, emissions) and their solution. The article then concludes that, in this case at least, a *social constructionist/legitimacy theory* perspective offers the more powerful explanation of events.

By contrast, Buhr (2002) formally theorises her examination of two different organisations and *their* very different reactions to and involvement with environmental reporting through Giddens' *structuration theory*. At its simplest, structuration theory is an articulation of the way in which individuals influence and are in turn influenced by the structures around them. That is, the relationship between individuals (agency) and structure is *reflexive*. The theory argues that, on the one hand, what we know as social life cannot be understood as a simple sum of all individual/micro-level activity but neither can all social activity be completely explained from a structural/macro perspective. The middle way between the extremes sees agents' repetition of acts both producing and re-producing structure – but, importantly, all social structures are understood to be neither inviolable nor permanent. Buhr uses this framework to study how pressures, issues and concerns were perceived, interpreted and then responded to by two separate organisations. The article contains recognition of the roles played by key agents, the possibilities offered and the restrictions placed by structure and culture, the influence (or not) of stakeholders as a function of either agency or structure and the long-term process through which reporting practices change or revert to type.

The organisation theory literature (as we have already seen) is rich in theoretical perspectives, and many of these have the potential for greater insights into social accounting. One further illustration might suffice for now – that of *discourse theory*. Discourse theory (which is discussed in Section 5.2) is concerned with how the ebb and flow of communication both reflects and creates both meaning and reality. The way we describe something reflects how we think of it and, depending on our individuality and relative power, may have a major influence on how we and others come to think of the issue in question. For example, Livesey and Kearins (2002) and Tregidga and Milne (2006) explored how language is used in disclosure to 'construct' the sense of the relationship between 'sustainability', the organisation and its traditional pursuits (see also Buhr & Reiter, 2006).

Finally, we should just flag up a range of factors (and thus, potential theoretical viewpoints) which is, again, not much developed in the social accounting literature (as far as we can tell) and which resonates with the role of the individual, which we very briefly consider later. This is the role of *groups* (and teams) *and identity*. The psychological and business management literatures are replete with explorations of the influence that groups exert in

organisations: not only in the completion of tasks and in the encouragement of effort, but also helping to determine the formation of an individual's identity and the acceptable norms of behaviour, thought and language. Consequently, shared beliefs (e.g. 'we are an ethical company') become reified and cannot be examined. An individual who might want to challenge such views is likely to find it very difficult indeed and so here (as with culture and a whole host of other factors – see later) may be another way in which (non) disclosure and (non) accountability decisions around social accounting might be explored (see, e.g., Knights & Willmott, 2007, for an introduction).

8.3. Economic/Rationalist

It seems to be relatively unusual for micro-studies, typically based on fieldwork, to seek out and apply economic explanations for social accounting practice (Miles et al., 2002). One exception is the study by Spence and Gray (2008) which examines the language used when officers of organisations explain their organisation's (non)engagement with both CSR and social and environmental reporting.[59] The paper infers that there appears to be a prevailing necessity for organisational participants to articulate most things through a version of *the business case* – there is little space for something which is not a business case, and anything that is to be adopted within the organisation must be expressed as part of a business case (regardless of any economic or other 'reality'). Thus, issues such as sustainability and CSR, which are increasingly being pressed upon organisations, must be (and can only be) re-articulated into terms commensurate with a business case; otherwise, they cannot 'code' to the organisation. Therefore, CSR and sustainability end up trivialised (Shamir, 2004).

8.4. Other and Other

We have been unable to identify a theoretical insight that would fit neatly into this section of Table 2, and therefore, it has been omitted (although see Hines, 1991). Therefore, although more could be said about theories of social accounting inside the organisation, it is not our intention to provide a definitive view of theories of and for social accounting but rather to illustrate the diversity of imported perspectives through which social accounting, its history, its development and its efficacy might be assessed. To illustrate how complex theory might be and to suggest how theory

construction (when needed) might be taken forward, consider the study by Adams (2002). That article (augmented by interviews conducted in the United Kingdom and Germany) drew from the extant literature a potentially bewildering array of factors that had a potential impact on the form and content of the social accounting. Adams categorises these influences as characteristics of the corporation, issues internal to the organisation and general contextual issues. The resultant model is shown in Fig. 1.

9. INDIVIDUAL-LEVEL THEORIES (MICRO-LEVEL III)

Individuals have, clearly, been present in all of the discussion so far. However, theories that focus on the individual do not feature very strongly in the social accounting literature or particularly in the accounting literature more widely (except that is in agency theory and related theoretical positions where all actions are seen as individualistic). A brief sketch of theories in and for social accounting is given in here.

The individual-level theories that we have in mind here refer, primarily, to explanations of why individuals do things and, in particular, why they might initiate or resist the development of social accounting. There are, as you might expect, a myriad of theories about human motivation, agency and resistance (up to and including agency theory that we discussed earlier). We are unaware of work undertaken specifically involving individual-level theory in social accounting, but research *has* identified an enormous array of personal motivations and concerns behind agency in social accounting. Perhaps, the most interesting thing to emerge from this has been the twin influence of the role of key individuals (sometimes called 'champions') and the way in which the social and environmental agendas have enabled such champions to merge their personal and their organisational values – something which is considered relatively rare in most profit-centred organisations (see, e.g., Adams, 2002; Buhr, 2002; Gray et al., 1995a, 1998; Spence & Gray, 2008). However, there is probably a great deal more to be done to discover why individuals do (and do not) support and develop social accounting (e.g. accountability), how salient issues are selected and managed, why some things cannot be discussed and how initiatives are developed or opposed. Working with the range of organisational theory, plus psychology and anthropology for example, holds out promise for yet further insights into the phenomena that attract us here.

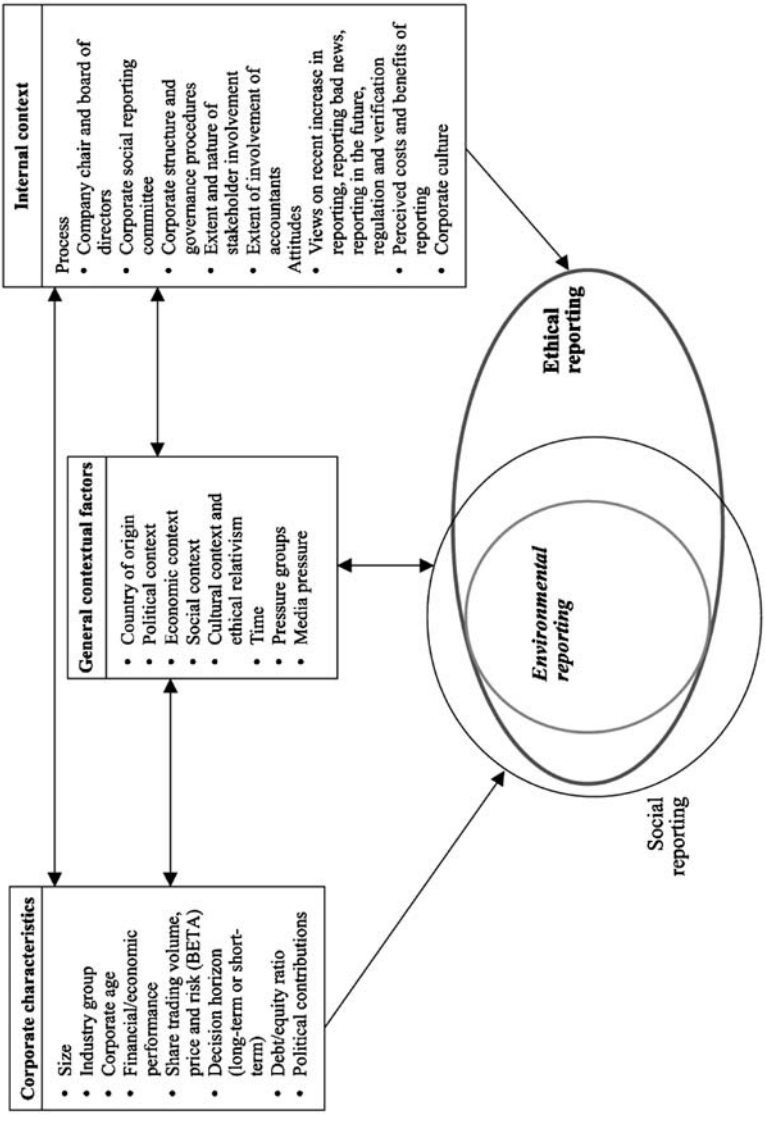

Fig. 1. Diagrammatic Portrayal of the Influences on Corporate 'Social' Reporting. *Note:* Arrows Show Direction of Influence. *Source:* Adams, 2002.

10. SUMMARY AND CONCLUSIONS

In this chapter, we have tried to provide a brief tasting of some of the range of theoretical lenses that might be brought to bear in our attempts to make some sense of social accounting. Theory is essential for any act of organising, analysing, understanding, evaluating, making proposals about or even trying to predict the future of any practice. Indeed, explicit awareness of the role of theory is crucial if we are ever to understand the biases and skewed perceptions that we often may bring to our study: we should ever be haunted by the suggestion from John Maynard Keynes that 'Practical men, who believe themselves to be quite exempt from intellectual influences, are usually the slave of some defunct economist'. In essence, when we think we are free of theory, we are probably applying a theory that is either little examined or little supported. And although it may be possible, to some degree at least, to avoid explicit examination of theory when we are working in the heart of an accepted paradigm, this is not the case when we are exploring an emerging and potentially radical exercise like that of social accounting.

We have seen that there is an enormous array of potential lenses – lenses that overlap and interact, lenses that occasionally compete and also lenses that can often mutually support each other. In an attempt to give them some organisation, we have categorised the theories through a series of underlying metaphors[60] and the level of resolution they most conveniently appear to adopt. Access to such a range of theories offers, we hope, the potential for a wider range of insights into social accounting and more imaginative research into its limited, non-existent and potential practice. Whatever else this review has provided, it has *not* provided a complete specification of the best ways to look at social accounting. There may be no such thing.

More especially, we hope that the foregoing is seen as opening up potentials and that it succeeds in sensitising one to how we might think about, perceive and react to activity around us. A theory directs our attention to a way of seeing and consequently to ways of more subtly recognising the complexities of the world we inhabit. The key issue is that we all need to theorise – to think about our issues; we may not all need *a* or even *the* theory.

To illustrate this, maybe one might dwell upon how social accounting is actually perceived as a consequence of theory. That is, it is not just that different theoretical lenses at different levels of resolution offer different insights into the potentials and actualities of social accounting, but they actually offer different views on what it is that one is looking at. For decision theory, social accounting is information in a decision; from an autopoietic view, it is something which may or may not code to a cell;

in some versions of stakeholder theory, it is a tool to manipulate stakeholders, in others it is the very essence of a relationship; for public and voluntary sector researchers, social accounting may be a means of articulating the values of the epistemic community (see, e.g., Gray et al., 2009); in communitarianism or feminism, social accounting might need to be fluid and relational for it to be worthwhile. For each view of social accounting, theory may offer us a mechanism through which we may perhaps either (say) express our frustrations about the current hegemony or seek a means through which change towards a more desirable state might be sought. Whether, therefore, we are talking of the same thing when we speak of 'social accounting' becomes a moot point.

Our final *caveat* is that we may need to tread carefully with the metaphors. The preceding paragraph warns us that each partial view of the world will offer different inclusions/exclusions and different vision/blindness. Our views are always partial, and the best we can seek is to develop the most sophisticated understanding of which we are capable and which fits most rigorously with our values and hopes for the world. A determination to stick with a paradigm, with a metaphor and with a level of resolution may be comforting, but it is unlikely to be the most admirable way in which we discharge our duties and responsibilities as a scholar.

Nevertheless, we hope that what can be taken away from this review is probably quite liberating. First, identifying our meta-theories – our worldviews in all probability – helps unpick biases, influences and even disagreements. This is because it seems to be definitionally the case that our theories influence our perceptions and our disagreements are often at the level of theory. More clarity over theory may lead to more intelligent debate and conversation. However, beyond this, what we start to see from this review is that life is complex and theories are always likely to be imperfect and incomplete: our self- and world-knowledge is always partial. Consequently, although a haphazard and thoughtless pick-and-mix approach to theory selection is not going to work, we do not need to be obsessed with selecting the 'right' theory. The overlaps and intersections between theories are such that they can all help to some degree, and if we are careful with our selection and observation of phenomena, the theory we select need not, of itself, keep us awake at night. Indeed, one of the more surprising revelations is that a number of the major conclusions about social accounting actually appear to be largely theory-independent. But in exactly the same way that a researcher needs to understand methodology, epistemology and ontology to decide that actually they often can be ignored, we have to be well-versed theorists before we can become cavalier in their application.

NOTES

1. We are adopting here the common shorthand of using the term 'social accounting' as a generic term to cover both the abstract notion of the universe of all possible accountings and the activities of social, environmental, ethical and sustainability accounting, accountability, reporting, auditing and responsibility and so on.

2. And we also have a sneaking feeling that institutional theory may be coming up fast as the next theory around which to herd.

3. We are especially grateful to Carmen Correa for her clear and honest articulation of this issue.

4. If your idea of a good time is curling up with Latour or Bourdieu; if you are re-reading *Capital* as your bedtime book as a break from your third reading of *Prison Notebooks* or if your education has provided you with a deep delight in Derrida and Foucault, then we suspect that much of what follows will fail to enchant you.

5. There have been attempts to address standardisation in social accounting both academically and professionally; see, for example, UN ISAR (1997), ISEA (1999), FEE (2000), GRI (2002), Parker (1986), and Gray, Dey, Owen, Evans, and Zadek (1997).

6. There is a widely held view that all perception is theory laden. This means that what we see, recognise and respond to is a function of our predispositions, beliefs and understandings – our theories in fact. See, for example, Wilber (2000) for a stimulating if eccentric approach to these issues and Tinker et al. (1982) for such an argument in accounting.

7. Theory is the term we will most generally use here, but 'framework', 'hypothesis' and 'model' are also terms that can mean similar things. We will not be worrying much about the difference in these terms here.

8. In fact, almost any good textbook on research methods will help in understanding theory and the role that it plays. There is conflict over theory: for illustration, there are a range of social science researchers (usually called positivists) to whom theory is only valuable if it is 'scientific' (whatever that means) and permits prediction. If you were not a 'positivist' you would not necessarily believe this to be either true or necessary.

9. Noting that it may not be possible to observe 'facts' free from theory.

10. 'Positive' in this context means descriptive: a statement of 'what is', which is not sullied by concerns of 'what should be' (which is 'normative') and, for many scholars, is a matter of observation and facts. It does *not* mean 'good' in the sense of 'feeling positive'. The word then lends itself to 'positivism', which is a belief set that good research is that which relies entirely on observation free from values – something we know simply as 'the scientific method'. You can (and indeed do) use positive statement(s) and method without being a positivist. (It all gets quite confusing.)

11. 'Normative' means a statement of values: a statement of 'what should be' not 'what is'. Any normative statement derives from your values, ethics, morals and principles. There is a widely held view that although it is essential to distinguish the normative from the positive in argument, no positive statement can ever be entirely free of the normative (see, e.g., Tinker et al., 1982). That is, our ways of seeing the

world, and our ways of deciding what to see as significant, reflect our theories and these reflect out values. (We said it got quite confusing.)

12. Indeed, one would have to be careful in suggesting that a full and free democracy would deliver sustainability as there is no (and probably cannot be any) direct evidence on this.

13. A 'project' refers here to the sense of a larger ambition within which the research sits and which justifies the research. One such project might be to 'make social accounting acceptable' or 'change the discourse on accountability and sustainability'.

14. Indeed, it may actually be that the essential nature of social accounting – given its emergent and political nature – must always remain a problem, which is not amenable to simple framing and which must remain unstructured to retain its radical edge. This might suggest that maybe we should stop demanding too much from our theories and get used to the idea of employing a range of underspecified theory to help as guides, lenses and aids to explanation – but then, would we have any coherent idea what we were doing or trying to do?

15. For more detail on the role of theory, see Laughlin (1995, 2004), and for a discussion of the failings of theory in social accounting, see Adams (2002).

16. This is, itself, another and very important piece of pragmatism. We hope that this structure (itself something of a theory) might contribute to understanding rather more than it might constrain it. There is no question that all frameworks achieve both, and therefore, the selection of a theory (or framework) has an instinctive and pragmatic element to it.

17. The word 'higher' may be confusing: it is a visual metaphor in which a greater resolution suggests a closer focus upon the issue of interest.

18. This is not to deny the value of a strategic and opportunistic selection of theories to reflect and illuminate a set of phenomena.

19. For example, the chances of a religious pacifist viewing any substantial aspect of the world in the same way as an aggressive solipsist are low.

20. For more detail on these issues see, for example, Bakan (2004), Bailey, Harte, and Sugden (1994a, 1994b), Chryssides and Kaler (1993), Kempner, MacMillan, and Hawkins (1976), Kovel (2002), Lehman (1992), Mathews (1993), Perks (1993), and Tinker (1985).

21. We reiterate that any adoption of any metaphor should invoke our caution at the meta-theoretical level.

22. See, for example, Thielemann (2000), for an interesting development of this approach.

23. Political economy was the term that would previously have referred to what we now know as economics – although modern economics has largely abandoned the political and sociological in its analysis. For convenience, we conflated Marxist and socialist worldviews in Table 1.

24. The most obvious source of further reading is Marx's work itself, but more accessible help can be gained from, for example, Tinker (1984), Held (1980), and Kovel (2002).

25. Later post-Marxist writing, most notably that of Marcuse, widened the source of structural change to embrace, simply, those who were marginal and disenfranchised by society (Marcuse, 1964). Other theorists, such as Gramsci, draw directly

from Marx, and his influence led to the formation of the Frankfurt School from which, what we currently call, critical theory emerged. Although not normally considered to be as politically active or radical, theorists as diverse as Foucault and Habermas are direct descendants of Marxian thinking, and their influence in accounting, business and social accounting research is considerable (for more details, see, e.g., Held, 1980).

26. In this, the communitarianism vision has a strong affinity with much work in the 'third sector' and social enterprise movements where social accounting is developing with relatively little direct engagement with – or by – the dominant academic literature. See, for example, Ball and Seal (2005), Gray et al. (2009), Pearce (1996), and Doane (2000).

27. For a critique, see Everett (2004) and Spence (2009). For an application of discourse theory in social accounting, see Milne, Kearins, and Walton (2006) and Tregidga and Milne (2006).

28. There is a myriad of omissions from the chapter, of course; from the detail of critical theory to theorising more normally associated with postmodernism (such as in the writings of Foucault, Baudrillard, Bourdieu and Laclau) or new emerging themes (such as Bebbington's use of Dean's notions of 'governmentality' to consider information, disclosure and reporting as mechanisms within a 'mentality' of governance, Dean, 1999). That said, we have not reviewed the theories of theology, psychology or anthropology either.

29. The word 'liberal' tends to cause problems for those not versed in political thought. It refers to the freedom of action of the agent and, in the modern context, the economic agent. It often bears little correspondence with modern manifestations of political parties with 'liberal' in their titles and more general notions of 'liberality' which tend to be associated with tolerance towards others – allowing them their freedom as it were. The associated worldview in Table 1 was that of the pristine capitalists.

30. In large part, this occurs 'naturally' in the conception because it is assumed that there are no systematic or systemic conflicts of interests between identifiable groups – itself because there are assumed to be no systematic or systemic groupings of 'classes'. That is, the model is 'atomistic' – a conception of a social world which consists entirely of individuals who may coalesce into groups (see below) but then fly apart again – constantly moving.

31. See, for example, Hayek (1960, 1982), Nozick (1974), and Friedman (1962).

32. The individual is thus free to be rich, free to starve, free to be politically active or inactive. In this world, the institutional framework – and thus the law and government – represents the wishes of the (actively choosing) people (the demos) and are brought into existence because the majority acting freely, rationally and in their own self-interest wish them to be.

33. A 'pen-picture' because one cannot summarise all of 150 years of modern liberal economic democracy in a few pages. For more detail, see, for example, Held (1987) and Macpherson (1977).

34. Recall that we distinguished between 'other' and the 'Other' earlier. Our primary focus here is on 'the Other'.

35. It is worth recording again that the more focused the theory (the higher the level of resolution), the more likely it is to be able to address and, indeed,

say something specific about social accounting and social accounting practice. This trade-off between scope and specificity seems to inevitably bedevil all theoretical speculation.

36. This is what Kirman (1999) found when seeking explanations for why substantive social accounting regulation that had been effectively promised in New Zealand in the 1990s was eventually rejected. Laughlin's (1991) model of change (see later) also bears a notable resemblance to this way of thinking.

37. Bourgeois political economy is most usually associated with Adam Smith and John Stuart Mill and subsequent economists. It is explained in a little more detail in Gray et al. (1996, p. 48 et seq.). In fact, it predates the separation of 'politics' and 'economics' that we currently take for granted in our schools and universities. Until relatively modern times – the late 19th century and increasingly through the 20th century – one would have studied political economy on the understanding that society, politics and economics were inseparable. This makes our classification of metaphors the more obviously artificial.

38. Reasons as to why this might be vary but among the suggestions are that Islam encourages a modesty and a disinclination to speak of one's virtues and successes.

39. The place (sometimes a physical space, more usually an electronic place) where financial 'products' and, most especially, the shares of companies are traded.

40. There is considerable work done in this field, and the implications of these issues roll over into 'ethical investment' and socially responsible investment (SRI); see, for example, Kreander (2001).

41. The situation is, of course, not quite this simple. Although we are taught that all investors are selfish and greedy, for many institutional and 'ethical' investors, this is simply too trite a view. For a broad introduction to the issues see, for example, Owen (1990), Margolis and Walsh (2003), and Murray et al. (2006).

42. For a more detailed exploration of these (and other) theories in a social accounting context see, for example, Adams, Coutts, and Harte (1995a), Gray, Kouhy, and Lavers (1995), and Guthrie and Parker (1989, 1990).

43. For an introduction to stakeholder theory see, for example, Ullmann (1985) and Roberts (1992), and for more detail, see Friedman and Miles (2002, 2006) and Donaldson and Preston (1995).

44. Although this would raise some issues about the 'human agency' requirement – an important and difficult debate in its own right that, for example, the deep ecologists have major issues over.

45. For an introduction, see Larrinaga-González (2007). To offer institutional theory as an organisational-level theory and as a biological metaphor may be thought misleading by some.

46. Bansal and Roth offer a complex and penetrating analysis of corporate response to environmental issues which connects with both institutional theory and the organisational change theories we will touch upon later.

47. See Pfeffer and Salancik (1978), and for a brief introduction, see Knights and Willmott (2007, p. 215).

48. The biological connection lies in the way in which there is assumed to be some ideal form(s) of an entity given the environment in which it operates, and therefore, to the extent that environmental conditions can be generalised, it can be assumed that the more successful the organisation (organism) the more closely it will

approximate this ideal. For more details see, for example, Knights and Willmott (2007, pp. 208–209).

49. To extend matters a little further still, Waddock and Graves (1997) employ something called *slack resource theory* to explain relationships between financial and social performance of organisations.

50. One illustration of this in the United Kingdom arises from the Church of England which, as a Christian Church, is committed to the principle of 'thou shalt not kill' and yet did, for many years, have a substantial number of financial investments with weapons manufacturers. The matter is clearly a complex one if weapons manufacturing is seen as a legitimate form of business to people who are sworn to uphold the sanctity of life.

51. Or, more likely, supported and encouraged by and through an industry representative body, a pseudo political body or a 'front' organisation – sometimes referred to as Astroturf organisations.

52. Such a view is commensurate with the work of, for example, Tregidga and Milne (2006) which examines how the language around sustainability is taken by corporations and their representative bodies and stripped of meanings (like zero or negative growth, equity and so on) that might be seen to challenge current business hegemony. That these authors use discourse theory as the key to unlocking this issue demonstrates the fluidity of theory and its categorisation.

53. The basic language and structure of agency theory sound a lot like the theory of accountability: contract, principal and agent. This is as far as the similarity goes. In essence if one stripped accountability theory of all its humanity, context and relationships and assumed narrow selfish motives then one might have ended up with agency theory.

54. It is also a theory that attracts considerable criticism. See, for example, Christenson (1983), Armstrong (1991), Arrington (1990), and Tinker and Okcabol (1991).

55. Fieldwork is a general term that refers to research in which the researcher leaves the office/university and studies the phenomena of interest in the context in which it arises – they 'go into the field'. This contrasts with other research methods that might involve study of data sets (e.g. share prices) or analysing documents (e.g. annual reports or CSR reports) away from the setting where the data or the documents were created.

56. See, for example, Filios (1985) or Bebbington, Gray, Thomson, and Walters (1994) for an illustration of questionnaire-based research in social accounting.

57. There is a parallel here with a number of dominant observations in the more 'positivistic', arms-length research. For example, regardless of theoretical position, social disclosure is more likely to happen in bigger organisations in certain countries and in certain industries.

58. The range of potential influences on the disclosure decision in organisations can verge on the bewildering. For example, unpublished PhD theses involving fieldwork from countries such as Bangladesh and Egypt have identified culture, the role of civil society, Islam, relationships with communities, the importance of overseas investors, the international financial community and the influence and attitude of other western companies all as active issues in the disclosure decision.

59. It was obvious that the two ideas were frequently seen as identical or at least interchangeable in the respondents' minds.

60. See the excellent work by Smircich (1983), which offers a range of metaphors of organisation, and by Morgan (1986) for a more detailed and in-depth approach to this activity.

ACKNOWLEDGMENTS

We are pleased to acknowledge the comments and suggestions from, inter alia, Jan Bebbington, David Collison, Carmen Correa, Jesse Dillard and Sue Gray on the issues that make up the chapter. We also gratefully acknowledge the comments of participants at the 1st North American CSEAR Conference at Concordia University, Montreal; the 20th International Congress on Social and Environmental Accounting Research at the University of St Andrews and the 2nd Italian CSEAR Conference in Rimini. We would especially like to acknowledge the help, stimulation and encouragement of Marty Freedman and two anonymous referees on an earlier version of this chapter.

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APPENDIX. A SELECTION OF AUTHORS AND THEORIES IN SOCIAL ACCOUNTING

	Metaphor			
Theory level (of resolution)	Biological	Political/ sociological	Rationalist/ economic	The 'Other'
Meta-theory (system level)	Maunder/Burritt Gray (et al.) Lamberton	Tinker/Puxty Lehman Unerman	Benston	Everett/Neu
Meso/sub-systems level	Larrinaga Kirman	Tozer/Hamilton Deegan/Brown Adams	Murray et al.	Cooper Andrews Hines
Micro I/ organisational	Roberts	Lindblom Patten Deegan	Chan/Milne Epstein/Freedman	
Micro II/internal to organisation	Gray et al./CPA Larrinaga/ Bebbington	Buhr Adams Tregida/Milne	Spence/Gray	
Micro III/individual		Gray et al./ICAS	Ness/Mirza	Hines Bebbington/ Thomson

ENVIRONMENTAL DISCLOSURE IN THE MINING INDUSTRY: A SIGNALING PARADOX?

Vanessa Magness

ABSTRACT

An environmental accident at a Placer Dome mine triggered a contagion effect across the Canadian mining industry. The decline in equity prices was moderated by prior disclosure of a high-level commitment to environmental management. Investors appear to interpret this information as a signal of expertise in the management of environmental risks and costs. The same companies are positioned to make the most credible financial disclosures about environmental management, and yet the evidence suggests that financial disclosures themselves have a negative impact on company value. There may be a miscommunication between investors and analysts on the one hand and mining company executives on the other, which could explain why mining company managers report their companies' shares are undervalued.

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 55–81

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004006

INTRODUCTION

Investors want better information to completely understand and value companies in the mining sector (PricewaterhouseCoopers, 2003). This study extends prior research on the value-relevance of disclosure by investigating annual report information disclosure within the context of signaling theory. A significant information gap currently exists between what company managers believe to be the pertinent value indicators and the information that investors and analysts consider to be important. Signaling theory offers companies a strategy for addressing this information asymmetry between management and external stakeholders without revealing valuable proprietary information.

The context of this study provides an opportunity to examine share price behavior following an environmental accident in 1996, during a time of growing public concern over the impact of business activity on environmental integrity. It was a time when shareholders were already sensitized to environmental issues because a similar accident had occurred less than a year earlier. Part I of this study examines share price behavior following an accident at a Placer Dome mine in the Philippines in 1996. Similar to the findings in the Blacconiere and Patten (1994) study of share prices following the Union Carbide accident in Bhopal, there is evidence of a contagion effect in the capital market at the time of the mining accident. The findings in Part II are also supported by Blacconiere and Patten (1994), as well as Blacconiere and Northcut (1997) and Freedman and Stagliano (1991). Part II finds the share price response to the information shock is mediated by prior disclosure. Prior literature has suggested this evidence is an indication that shareholders interpret disclosure as a signal of company quality. In this study, however, investors appear to be more impressed with the presence of a high-level corporate committee with oversight on environmental matters than with the extent or nature of the disclosures recommended in the CICA handbook provisions at the time of the event. This evidence conflicts with the findings in the Freedman and Stagliano (1991) study, where the modifying effect on share price was traced to the cash flow-related items.

Most capital market studies draw their data from the United States. Few studies use Canadian data because the equity market in this country is relatively small, and many of the companies here are also small, with shares that trade infrequently. However, the natural resource sector in this country provides a viable research opportunity. There are enough large mining companies such that the statistical problems associated with small samples and thin trading can be avoided. In her review of event study literature,

Magness (2001) questioned why those few studies that do use Canadian data failed to support the findings of the US research. This chapter begins to explore the answer to that question. Given the significance of the natural resource industry in this country, a firm basis for future research in environmental accounting in Canada is a pertinent contribution to the academic literature.

The findings of this chapter are also relevant to industry managers. A PricewaterhouseCoopers survey in 2002/2003 suggests that investors are not getting sufficient information to effectively evaluate the shares of mining companies in Canada. The results of this survey are perplexing, given the introduction of the Global Reporting Initiative (GRI), which was also cited in the PricewaterhouseCoopers report. The GRI is a joint initiative of the Coalition for Environmentally Responsible Economies and the United Nations Environmental Program. The objective of the GRI is to develop a globally accepted reporting framework to enhance the quality and rigor of sustainability reporting based on principles such as transparency, completeness, relevance, accuracy, comparability, clarity, and timeliness. The GRI was introduced in 1997, and yet five years later, the PricewaterhouseCoopers survey reports that investors and financial analysts alike say that much of the information they want is not disclosed. Canadian mining company executives, also surveyed in the report, believe their companies' shares are undervalued. The findings of this chapter underscore the survey results by highlighting a possible mismatching of information signals, which may be a factor contributing to this problem.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Investors respond to independent evidence of companies' pollution performance. For example, share prices in the United States fell in the paper, power, oil, and steel industries after the Council on Economic Priorities released environmental performance information (Shane & Spicer, 1983). In Canada, pulp and paper shares are negatively associated with government reports of excess effluent (Cormier, Magnan, & Morard, 1993; Cormier & Magnan, 1997). Klassen and McLaughlin (1996) examined share behavior in various industries and found that a company's shares respond favorably when it receives an award for exemplary environmental performance. This positive correlation of share price with environmental

performance is interpreted to be a reflection of lower expected future liabilities for companies with good environmental records (Klassen & McLaughlin, 1996; Cormier & Magnan, 1997). Prior studies explore the basis for this expectation. For example, Clarkson, Li, and Richardson (2004) find that for companies with good environmental performance, investors treat environmental control expenditures as capital investments – cash outlays with an expected future benefit, whereas a similar cash outlay by a poor environmental performer is treated as an expense, with no future benefit. Cormier and Magnan (1997) and Cormier et al. (1993) suggest that investors discount the value of implicit environmental liabilities into share price for companies with relatively large pollution measures. These conclusions support the *future expectations* interpretation by highlighting investor concern about future economic costs.

Epstein (1996) surveyed institutional investors and found that they want better information about externalities. Externalities are costs that are triggered by business activity, but neither borne by the companies involved nor reflected in their financial statements. There is no generally accepted way of measuring them for accounting purposes, and for this reason, externalities are not commonly reflected in financial statements (Magness, 2003). However, in a changing regulatory environment, today's externalities can become tomorrow's cash flow obligations. For example, when measured in terms of hospital costs and lost wages, respiratory illness in the United States was estimated to cost 2 billion dollars in 1963 (Estes, 1972). Over the years, the external costs of air emissions have been redirected to company ledgers through legislated controls affecting the companies that generate the pollution. As such, societal demand for companies to reduce externalities can eventually be enshrined in regulation that affects company cash flows.

Managers, especially in companies in environmentally sensitive industries, have responded to societal concerns by voluntarily increasing disclosure about environmental protection and remediation efforts (Gray, Javad, Power, & Sinclair, 2001). However, the accuracy and usefulness of information that comes from the companies themselves has been called into question. In the annual reports of firms from several countries, environmental disclosures are described as vague, incomplete, or unreliable (Wiseman, 1982; Freedman & Wasley, 1990; Gamble, Hsu, Kite, & Radtke, 1995; Harte & Owen, 1991; Fekrat, Inclan, & Petroni, 1996; Deegan & Gordon, 1996; Blunn, 1992). Given the relevance of this information to investors, this means that companies are withholding information that shareholders want. However, three event studies observed a modifying effect of disclosure on share price in the wake of information shocks to the capital

markets. Blacconiere and Patten (1994) examined the response of chemical industry shares to the Union Carbide gas leak in Bhopal. Blacconiere and Northcut (1997) looked at chemical company share reaction to modifications to the *Superfund Amendments and Reauthorization Act*. These modifications enhanced the reporting requirements for companies that release hazardous substances into the environment. Finally, Freedman and Stagliano (1991) looked at share reaction to new *Occupational Safety and Health* legislation that limited cotton dust emissions in the textile industry. In each of these three cases, share prices declined across the respective industry. The decline was muted, however, for those companies that disclosed more environmental information in their annual reports before the event.

The paradoxical question here is that if internally produced environmental performance information is vague, incomplete, or unreliable, then why would investors look to this information for comfort at a time of market distress? In the three event studies discussed earlier, the authors interpret their findings to be evidence that management communicated information, which became value-relevant in light of an event that introduced new information into the capital market. This study begins with this interpretation and draws on *signaling theory* for insight into the disclosure decision-making process. The findings of this chapter unearth another paradox that the signals provided by management, if they are indeed meant to be signals, are not received favorably by the shareholders. The shareholders appear to respond positively to different information, which suggests there is a miscommunication, or misalignment of signals. This miscommunication may explain why Canadian mining company managers say their shares are undervalued (PricewaterhouseCoopers, 2003).

The basic premise of signaling theory is that a high-quality firm wants to signal its value to the external audience. "Quality" can refer to many different things such as investment opportunities, research and development, or expertise in managing environmental risks and costs. Signaling models examine ways for firms to communicate their underlying quality. Direct disclosure of this information, however, could reveal valuable proprietary information. A signaling strategy employs the release of financial or nonfinancial information that is correlated with company value, but does not divulge proprietary information (Healy & Palepu, 1993).

Certain conditions must be met for a signaling strategy to be effective. For example, the manager must have an incentive to use the signal; the information disclosed must have an observable relation to an underlying quality of interest (such as prospective cash flow); and the signal must be

difficult to imitate (Toms, 2002). A higher share price would be one example of a benefit that accrues to the company with an effective signaling strategy. In terms of cost, any low quality firm that adopts a signaling strategy to misrepresent its quality status would experience the cost penalty when it engages in the market later for sales, labor, or new equity (Spence, 1973). Taken together, these criteria show that signaling is a strategic decision that involves weighing the costs and benefits of disclosure. It is assumed, however, that once the decision is made to engage in signaling strategy, the receivers of the signal will interpret the information in the way management intends. Otherwise the signal is ineffective.

When Blacconiere and Patten (1994, p. 375) offered the following interpretation of share reaction to the accident in Bhopal: "If firms tend to disclose 'good news' and suppress 'bad news' concerning their exposure to environmental risk, investors may interpret these prior disclosures as a positive signal concerning the firm's exposure … [to future regulatory costs]," they in effect opened the door to future explorations of signaling theory within the context of environmental performance. Similarly when Freedman and Stagliano (1991) said that the disclosure of projected costs of new emissions-control equipment reduced investor uncertainty about the impact of new legislation, they implied that disclosure signaled a superior ability to contend with regulatory change and to compete in a highly competitive environment. Bewley and Magness (2008) found evidence suggesting that when US regulators mandated the disclosure of what had previously been voluntary information about contingent environmental liabilities, companies that had released this information in the past adopted new future-oriented financial information as a new signal. This chapter uses the Canadian mining industry as a context for exploring the role of signals – signals that are received and interpreted by investors, and signals that are included in management disclosure strategy – and asks the question: are they the same?

RESEARCH CONTEXT AND DESIGN

In the mining industry, a tailings dam forms the walls of the containment ponds to hold the water discharged during the ore recovery operations. Depending on the level of treatment, this water may or may not be toxic. On March 27, 1996, a massive failure in the Makulapnit dam in the Philippines spilled 4 million tonnes (1.6 million cubic meters) of waste water into the Boac River. This dam was part of the Marcopper mine, which was owned

(in part) by Placer Dome, a publicly traded Canadian company. There are three reasons to expect an investor response to this accident:

- societal concern with environmental issues was heightened by the Exxon Valdez accident in 1989 (Walden & Schwartz, 1997);
- capital market sensitivity to environmental accidents increased in the latter part of the 1990s (Magness, 2000); and
- a similar accident had occurred less than a year earlier.

The earlier accident happened in Guyana. Two million cubic meters of cyanide-contaminated wastewater spilled across the countryside and into the Essequibo River. A state of environmental emergency was declared. The mine, owned by Cambior, another Canadian mining company, was closed for five months.

When accidents like these occur, the company directly involved incurs substantial costs for clean-up and litigation. However, other costs affect the entire industry. For example, after the first accident, a Commission of Enquiry made a recommendation to the Guyanese government to establish environmental protection regulation for the country's industries (Whyte, 1996). In Canada, the mining industry responded by developing new procedures for tailings dam construction (Mining Association of Canada, 1998). It can therefore be concluded that this first accident not only affected gold mining operations in Guyana but also raised serious industry-wide issues in Canada. A study of mining company shares at the time of this accident, however, revealed no statistically significant response in the equity market (Magness, 2008).

When the second accident occurred, hundreds of families were isolated, fish and marine life were destroyed, and environmental officials said "the Boac River is now dead" (Pelaez, 1996). The President and CEO of Placer Dome said that while the second accident was not as bad as the first, the accident in Guyana had sensitized emerging countries to the environmental effects of the mining industry (Reuters, 1996). The Marcopper Mine was closed indefinitely when the leak was discovered. Together these two accidents were a "black eye" for the industry, and a spokesperson with the Toronto environmental group Probe International said, "Canada is beginning to get a very bad reputation in the Third World for destroying the environment" (Chatterjee, 1996). Given that many Canadian mining companies have extensive operations in these countries, the potential existed for the legislative repercussions to affect Canadian mining operations around the world. For these reasons, the second accident presents an

opportunity to review and extend the findings of the US event studies that were discussed earlier.

Part I – Did Mining Industry Shares React to the Placer Dome Accident?

The first hypothesis to be tested is

Hypothesis 1. The Placer Dome accident triggered a capital market contagion effect across the mining industry.

This chapter draws on the market model, which relates the return on a stock (or a portfolio of stocks) to the movement in the overall market through the following model:

$$R_{p,t} = B_{0p} + B_{1p}R_{M,t} + \varepsilon_{p,t} \quad (1)$$

where $R_{p,t}$ is the return on portfolio p at time t, $R_{M,t}$ the value-weighted market return, B_{0p} the intercept for the portfolio p; B_{1p} the slope coefficient (beta) for the portfolio, and $\varepsilon_{p,t}$ the ols error term. Thus, return R on portfolio p at time t is related to market return, R_M. Event study methodology (ESM) assumes markets react quickly to new information by rapidly adjusting to an equilibrium level that incorporates the market's revised view of the risk/return trade-off (Fama, Fisher, Jensen, & Roll, 1969; Fama, 1970; MacKinlay, 1997). Inherent in this methodology is the assumption that an accident that directly involves only one company will trigger intra-industry information transfers though the capital markets on or immediately after day 0, the day the markets learn of the event (Clinch & Sinclair, 1987). An incident can precipitate tighter government regulation that affects all companies in that industry, as occurred following the event in Guyana. For this reason, shares of competing companies can be affected. To test whether or not this occurred after the Placer Dome accident, a sample of gold mining companies was selected, subject to two criteria:

1. *Industry* – companies must have operated at least partly in the same industry as Placer Dome (Compustat was used to identify companies with SIC number 1040-gold and silver ores); and
2. *Data availability* – company returns must have been available on the *Canadian Financial Markets Research Centre* daily database during the estimation period.

Forty-three companies were identified, excluding Placer Dome. Of those 43 companies, only the companies that traded on each day over the

estimation period (see later) were selected to form the portfolio. Six companies were excluded because of this criterion, leaving a final portfolio consisting of 37 companies.

The average daily returns of the portfolio were regressed against the market over a period of 401 days, including 200 days leading up to day 0, and 200 days immediately afterward. By straddling the event date in this manner, the model accommodates any changes in beta (B_1) in model [1], which were triggered by the accident.[1] Parameter estimates for B_0 and B_1 obtained from this regression were then used to forecast expected returns for day –10 to day 10 inclusive. The impact of the accident on stock behavior was examined by testing the error term $\varepsilon_{p,t}$ for signs of abnormal price changes over that 21-day period[2]. The abnormal return (if any) is expected to be negative.

Part II – Was Individual Company Share Reaction Correlated with Disclosure?

The event study itself is often just the first in a series of procedures employed to identify factors that trigger a share reaction. For example, in studies by Blacconiere and Patten (1994), Blacconiere and Northcut (1997), Freedman and Stagliano (1991), and Patten and Nance (1998), the authors followed their event-studies with an investigation of the effect on investors' perception of environmental disclosures made prior to each event. The second hypothesis is

Hypothesis 2. Share behavior after the Placer Dome accident was influenced by prior environmental disclosure.

Examination of this hypothesis requires an analysis of the relationship between cumulative abnormal returns and pre-event information disclosure.

Daily returns data for each of the 37 companies were used to estimate company-specific parameters B_{0i} and B_{1i}. These parameters were then used to forecast company returns for the days immediately following the accident. Two, three, four, and five-day cumulative abnormal returns (CAR_i) were calculated as

$$CAR_2 = \varepsilon_{i0} + \varepsilon_{i1} \tag{2}$$

$$CAR_3 = \varepsilon_{i0} + \varepsilon_{i1} + \varepsilon_{i2}$$

$$CAR_4 = \varepsilon_{i0} + \varepsilon_{i1} + \varepsilon_{i2} + \varepsilon_{i3}$$

and

$$CAR_5 = \varepsilon_{i0} + \varepsilon_{i1} + \varepsilon_{i2} + \varepsilon_{i3} + \varepsilon_{i4}$$

In this model, ε_i is the abnormal return for company i at time t. The subscript i is used here, in place of p, to indicate that the abnormal return is company-specific in model (2).

The key independent variable in this part of the study is a measure of environmental disclosure in the annual reports for the fiscal year ending before March 1996, the time of the accident. The choice of disclosure media is the subject of considerable debate in the disclosure literature. Although the annual report is not the only avenue of disclosure available to managers (Zéghal & Ahmed, 1990), this medium is a primary information source for institutional investors (Hutchin, 1994), financial analysts (Barron, Kile, & O'Keefe, 1999), environmental groups (Patten, 1992; Gamble et al., 1995), as well as individual investors and general users (Epstein & Freedman, 1994; CICA, 1994). Furthermore, despite repeatedly expressed concerns as to the accuracy of its contents (discussed earlier), discussion of environmental and other social responsibility information is considered to have greater credibility when it is included in the annual report than in other media (Tilt, 1994), possibly because of its proximity to the audited financial statements (Warsame, Neu, & Simmons, 2002). Finally, Rankin (1996) observed that most stakeholders seeking environmental information look first to the annual report. The emergence of the standalone environmental report in the 1990s led to questions about the relative importance of the annual report as a disclosure medium. However, Gibson and O'Donovan (2000) found that annual report disclosure of environmental information was still on an upward trend in the latter part of the decade, suggesting management continues to regard the annual report as a key medium for disclosure of this nature. These factors together support the use of annual report disclosure for events that occurred in the mid nineties.

The design of a disclosure index is also a critical factor in studies of this nature. With the introduction of the GRI in 1997, a much richer set of discretionary disclosure items has been offered to company managers as a way of conveying more rigorous and useful information. Voluntary disclosure theory suggests that managers will exploit the flexibility of discretionary disclosure to convey information that may signal company quality. In keeping with the theory, studies of more recent events draw on broadly based measures such as the GRI, and some studies focus

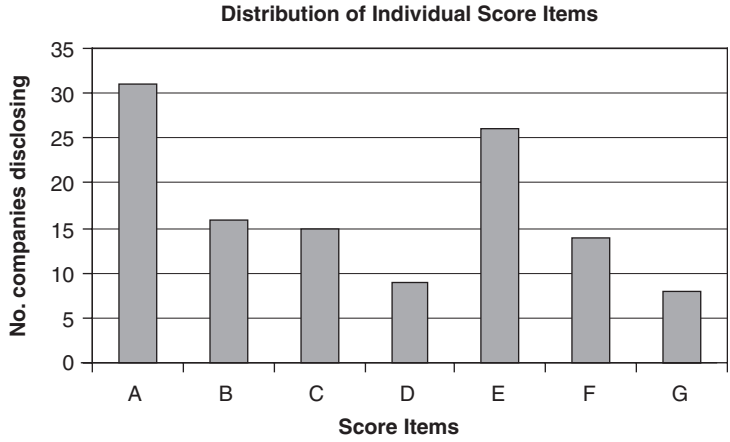
entirely on voluntary information items (Clarkson, Li, Richardson, & Vasvari, 2008). This chapter draws on an event that predates the introduction of the GRI, employing a disclosure index modeled on the ones used in the US event-studies of Blacconiere and Patten (1994), Blacconiere and Northcut (1997), and Freedman and Stagliano (1991). The index was adapted and used in Magness (2006) and is particularly appropriate for this current study because it reflects Canadian disclosure guidelines that were designed for the natural resource industry. Furthermore, it captures information items that prior research found to be relevant in the capital market.

The information items in $Score_i$ are shown in Table 1. $Score_i$, ranging from 0 to 7, is a broad measure of financial versus qualitative, forward looking versus historic, and mandatory versus discretionary items. Items A, C, D, and G were adapted from the score factor used by Blacconiere and Patten (1994). Item B is included as a signal of management commitment to environmental stewardship. Research has shown that this commitment is viewed favorably by investors (Surma & Vondra, 1992). Disclosure items E and F were recommended in s3060 (capital assets) of the Canadian Institute of Chartered Accountants handbook for the years in question. This part of the handbook was specifically designed to provide guidance to companies in the natural resource industry. Item F refers to the estimated liability associated with land reclamation activities that are scheduled for the end of each mine's useful life. This estimate, aggregated across all of the company's sites, corresponds to item F in this disclosure score. It was industry practice to accrue a portion of this liability annually, using a units-of-production method. The annual accrual corresponds to item E. Although both E and F were recommended disclosure items, prior research reveals that item F was often omitted (Li, Richardson, & Thornton, 1997). Item F is also included here because it has value relevance in the Canadian capital markets (Li & McConomy, 1999). Item G was required by s3290 (contingencies) but was also often omitted (Li et al., 1997; Byrd & Chen, 1997).

The reports were scored independently by two accounting professors. Using the items shown in Table 1, one point was awarded for the presence of each item regardless of its location in the annual report. Scores for the 37 companies ranged from 0 to 6, with an average of 2.6[3]. This seven-item scoring tool was used in Magness (2006) to study the interactions hypothesized by Ullmann (1985) between strategic posture, profit, and stakeholder power. It has also been used to identify signaling efforts among

Table 1. Description of Disclosure Score Items.

A Statements on the compliance status or compliance efforts of the company relative to environmental standards
B Existence of a board level committee or senior executive officer responsible for monitoring environmental regulations and the environmental impact of operations
C Presentation of current year cash flows for environmental remediation
D Disclosure of estimated cash flows for environmental remediation in the next year
E Disclosure of current period estimate of future environmental liability
F Disclosure of estimated total future environmental liability
G Statements on current or potential environmental actions/law suits against the company



companies that are adjusting to reporting regulations (Bewley & Magness, 2008), and again when examining the stability of share betas at the time of both the 1995 and the 1996 accidents discussed in this chapter (Magness, 2008).

The model used to test the sensitivity of share price response to disclosure is

$$CAR_i = B_{0i} + B_1 Score_i + B_2 XL_i + B_3 Size_i + B_4 ROE_i + B_5 Beta_i + B_6 Score_i^* XL_i + B_7 PCRev_i + \varepsilon_i \quad (3)$$

where CAR_i is the cumulative abnormal return for company i, discussed earlier; $Score_i$ a seven-item disclosure rating discussed earlier; XL_i the series of residuals obtained when a dichotomous listing variable $List_i$ (coded 1 if

Table 2. Summary Statistics for Independent Variables ($N = 37$).

Variable	Mean	Standard Deviation	Variance	Minimum	Maximum
$Score_i$	2.568	1.757	3.086	0.000	7.000
$List_i$	0.567	0.502	0.252	0.000	1.000
$Size_i$	19.529	1.760	3.098	15.215	23.454
$Beta_i$	1.307	0.530	0.281	–0.396	2.446
ROE_i	3.776	23.927	572.500	–30.110	122.310
$PCRev_i$	0.61	0.419	0.176	0.000	1.000

Correlation Matrix

	$Score_i$	$List_i$	$Size_i$	$Beta_i$	ROE_i	$PCRev_i$
$Score_i$	1.000					
$List_i$	0.097	1.000				
$Size_i$	0.477	0.464	1.000			
$Beta_i$	–0.175	0.003	–0.266	1.000		
ROE_i	–0.194	–0.163	–0.174	0.124	1.000	
$PCRev_i$	0.0887	0.317	−0.044	−0.156	−0.0252	1.000

$Score_i$ is a seven-item disclosure rating discussed earlier. $List_i$ is a dichotomous variable, coded 1 if the company's shares are interlisted on the NYSE, AMEX, or NASDAQ; 0 otherwise. $Size_i$ is the natural log of the market value (number shares outstanding multiplied by share price) of company immediately before day 0 (Botosan, 1997). $Beta_i$ is the pre-event beta for stock i estimated using day –200 to day –1. ROE_i is the return on equity (net inc/shareholder equity). $PCRev_i$ is the proportion of total company revenues derived from gold or silver mining operations (1 = 100%).

the company's shares are interlisted on the NYSE, AMEX, or NASDAQ) is regressed against company size as discussed below; $Size_i$ the natural log of the market value (number shares outstanding multiplied by share price) of company i immediately before day 0; ROE_i the return on equity (net income/shareholder equity); $Beta_i$ the pre-event beta for company i (measured using the 200 days ending immediately before day 0); $Score_i^* XL_i$ is $Score_i$ interacted with the variable, XL_i, and $PCRev_i$ the percentage of total revenues from gold and silver mining operations.

Summary statistics for the independent variables are shown in Table 2. Several control variables are included in model (3) to capture the effect of influences other than score on share price. For example, interlisted companies are subject to greater shareholder attention, given the broader basis of ownership. For this reason, when an industry reaction occurs, these shares come under more intense buying/selling pressure than shares

whose trading is restricted to a Canadian exchange. A dummy variable $List_i$ is set equal to 1 if company i is interlisted on a major US exchange. This listing variable is highly correlated with company size (Table 2), which means the standard errors of the coefficients estimated with model (3) could be inflated. To reduce the likelihood of type II errors, *List* is regressed against *Size*, and the residuals from this application are labeled XL_i in model (3). The direction of impact is expected to depend on the impact of the contagion. If the event study in Part I finds a negative industry reaction as expected, CAR_i should be lower for interlisted companies, due to their higher trading activity. The pre-event betas are expected to be negatively correlated with CAR_i because a negative price reaction should be exaggerated for the higher risk (higher beta) shares. The direction of association of $PCREV_i$ with CAR_i is also expected to be negative. That is, as exposure to this segment of the mining industry rises, the negative price reaction CAR_i is expected to be larger.

The correlation of CAR_i with the other control variables is indeterminate. $Size_i$ may have a negative (decreasing) impact on abnormal returns because large companies are subject to greater public scrutiny and are often targeted by new regulation (Bewley & Li, 2000). On the contrary, larger companies have more resources, enabling them to comply with new regulation. Also, large companies can have diversified operations, making them less susceptible to the cash flow impact of regulations that pertain to the mining industry. These two factors – the availability of resources and the benefits of diversification – suggest the association of company size with CAR_i would be positive. ROE_i is included as a measure of financial health. Companies in good financial health are in a better position to deal with prospective regulatory changes triggered by the accident, implying a positive correlation. On the contrary, companies that are doing particularly well may also be targeted by legislative change (Cormier & Magnan, 1999). The interactive factor $Score_i^* XL_i$ is introduced because it is assumed that interlisted shares of companies with higher scores will respond more to information shocks than shares restricted to the Toronto exchange. The correlation of $Score_i$ with CAR_i (discussed later) is expected to be positive. However, given the direction of the XL_i factor is expected to be determined by the results of Part I as discussed earlier, the coefficient of the interactive term could be either positive or negative.

The correlation of interest in model (3) is that of $Score_i$ with CAR_i. Campbell, Sefcik, and Soderstrom (1998) said that investors factor uncertainty about environmental liabilities into share price. If this is correct, and if $Score_i$ effectively captures information uncertainty, the results

of this application should mirror the US event studies. In other words, the share reaction to the accident will be muted for high-disclosure companies, as was the finding of Blacconiere and Patten (1994) and Blacconiere and Northcut (1997). Freedman and Stagliano (1991), however, found shareholders respond to financial items rather than to a broadly defined score. It has also been argued that share reaction will be driven at least partially by the credibility of the information. Mercer (2004) argued that one factor affecting the credibility of financial disclosure is input from the board of directors or an internal or external audit committee. It is possible that a similar assumption could be made with regard to the credibility of environmental information. Klassen and McLaughlin (1996) and Surma and Vondra (1992) argued that investors respond favorably to companies with a high-level commitment to environmental management. Evidence of such a commitment would be the disclosure of a board committee or executive officer responsible for monitoring environmental regulations, impacts, and costs. This information is captured by item B. With this in mind, model (3) is applied three times. The first application uses the full seven-item score; the second redefines $Score_i$ as a dichotomous variable equal to one if item B is disclosed. The third application uses a 0–4 score comprised of the financial items only.

RESULTS AND DISCUSSION

Part I – The Placer Dome Accident Prompted an Industry Wide Share Reaction

Results of the abnormal returns analysis are shown in Table 3. A statistically significant negative abnormal return on day 1 indicates an industry reaction the day after news of the leak was publicized in North America. There is also evidence of a downward drift in price over a four-day period following the initial reaction on day 0. Abnormal returns for day 5 to day 10 are examined to confirm the end of this downward drift. The abnormal returns for each of the 10 days before day 0 were tested, but showed no evidence of pre-event abnormal price activity.

Additional analysis was conducted to explore the sensitivity of these results to confounding factors. The *Canadian Business and Commercial Affairs* database was used to identify potentially confounding events such as heavy insider trading activity, new share offerings, environmental assessment rulings, earnings and compensation announcements, major changes in

Table 3. Abnormal Return Analysis (see Hypothesis 1).

Day	$\varepsilon_{p,t}$
0	–0.0004
1	–0.0258*
2	–0.0095
3	–0.0117
4	–0.0128
5	0.0115
6	–0.0053
7	0.0101
8	–0.0113
9	0.0111
10	0.0011
R^2 adjusted: 0.160	
F statistic: 38.924 ($p = 0.000$)	

*Significant at 0.05.

company ownership, and announcements of major expansions in mining activity. The model was tested again, excluding companies with news items reporting any of these events over the period from day −10 to day 10, with no change in the results.

Part II – Share Reaction Is Directly Associated with Prior Disclosure

The results of the cross-sectional analysis using two-, three-, four-, and five-day CARs are shown in three separate tables. Table 4a shows results when $Score_i$ is defined using the full seven items. Table 4b shows results using $Score_i$ as an indicator variable. Table 4c shows results where $Score_i$ is a 0–4 score consisting of items C, D, E, and F from Table 1. The coefficient of the interactive term $Score_i^* XL_i$ is negative in all iterations of the model, which is consistent with the view that the price of interlisted shares respond more because these companies are subject to greater investor scrutiny. However, the coefficient of $Score_i^* XL_i$ is statistically significant for only the two- and three-day CARs when $Score_i$ is used as an indicator variable (Table 4b). The correlation of CAR_i with companies' pre-event betas is also negative and statistically significant in all cases except the five-day CAR in Tables 4a and 4c. This negative relationship is consistent with the expectation that share prices in relatively high-beta companies will decline more, in keeping

Table 4a. Cross-Sectional Analysis [see Hypothesis 2 and Eq. (3)].

Independent Variables			Dependent Variable Coefficients			
		Predicted sign	CAR_2	CAR_3	CAR_4	CAR_5
B_0	*Intercept*	+/−	−0.24893	−0.8727	−1.6632	−1.6876
B_1	$Score_i$	+	−0.0769	−0.1425	−0.2438	−0.2357
B_2	XL_i	−	−0.1895	−0.4159	−0.7030	−0.6700
B_3	$Size_i$	+/−	−0.0143**	−0.0461***	−0.0859***	−0.0863**
B_4	ROE_i	+/−	0.0008	−0.0011***	−0.0005**	−0.0022*
B_5	$Beta_i$	−	−0.0348**	−0.0448**	−0.0458**	−0.0418
B_6	$Score_i^*$ XL_i	+/−	−0.0656	−0.1319	−0.2323	−0.2184
B_7	$PCRev_i$	−	−0.0047*	−0.0049*	−0.0049*	−0.0065
R^2 adjusted			0.291	0.454	0.463	.0354

CAR_2 is the estimated two-day cumulative abnormal return; CAR_3 the estimated three-day cumulative abnormal return; CAR_4 the estimated four-day cumulative abnormal return; CAR_5 the estimated five-day cumulative abnormal return; $Score_i$ a 0–7 disclosure rating as described in Table 1; XL_i a listing variable. $List_i = 1$ for interlisted companies. XL_i is $List_i$ regressed against size; $Size_i$ the natural log of the market value (number shares outstanding multiplied by share price) of company i immediately before day 0; ROE_i the return on equity (net income/ shareholders' equity); $Beta_i$ the pre-event beta for stock i estimated using day −200 to day –1; $Score_i^* List_i$ equals 1 if item B is disclosed, and the company is interlisted on the NYSE, AMEX, or NASDAQ; 0 otherwise; $PCRev_i$ the percentage of revenue derived from gold and silver mining operations. Number of observations = 37.

*Significant at $\alpha = 0.10$.

**Significant at $\alpha = 0.05$.

***Significant at $\alpha = 0.01$.

with their higher risk status. The size factor is negative and statistically significant in all cases. The ROE_i factor is negative and statistically significant in all cases except the two-day CAR in Table 4a, and the four- and five-day CARs in Table 4b. The negative direction is consistent with the view that large companies, and those in good financial health are targeted for legislation in the event of a stakeholder backlash following an accident. With the exception of the five-day CAR for Tables 4a and 4b, the *PCREV* factor is also statistically significant and negative, indicating the negative share price reaction was accentuated by companies' exposure to gold and silver mining operations.

The key independent variable $Score_i$ is positive and statistically significant when it is defined to represent disclosure item B in the analysis of the two-day, three-day and four-day CARs. This finding is consistent with the view

Table 4b. Cross-Sectional Analysis [see Hypothesis 2 and Eq. (3)].

Independent Variables			Dependent Variable Coefficients			
		Predicted sign	CAR_2	CAR_3	CAR_4	CAR_5
B_0	*Intercept*	+/−	0.38371***	0.38461***	0.42504***	0.4263***
B_1	$Score_i$	+	0.06561**	0.06346**	0.0546*	0.0256
B_2	XL_i	−	−0.02017	–0.02383	0.0173	−0.0425
B_3	$Size_i$	+/−	−0.0174***	−0.01733***	−0.2000***	−0.0198***
B_4	ROE_i	+/−	−0.0011***	−0.0011***	−0.0001	−0.0005
B_5	$Beta_i$	−	−0.0441**	−0.03149*	−0.0313**	−0.0449**
B_6	$Score_i^*$ XL_i	+/−	−0.0711*	−0.06487*	−0.5053	−0.0350
B_7	$PCRev_i$	−	−0.00469*	−0.00495**	−0.0050*	−0.0046
R^2 adjusted			0.495	0.479	0.425	0.310

$Score_i$ equals 1 if company disclosed item B, the existence of a board level committee or executive officer responsible for monitoring environmental regulations and the environmental impact of operations; 0 otherwise. See Table 4a for description of other variables. Number of observations = 37.
*Significant at $\alpha = 0.10$.
**Significant at $\alpha = 0.05$.
***Significant at $\alpha = 0.01$.

Table 4c. Cross-Sectional Analysis [see Hypothesis 2 and Eq. (3)].

Independent Variables			Dependent Variable Coefficients			
		Predicted sign	CAR_2	CAR_3	CAR_4	CAR_5
B_0	*Intercept*	+/−	0.23876	0.2587*	0.2721*	0.1036
B_1	$Score_i$	+	−0.0529*	−0.0239*	−0.0542*	−0.0733*
B_2	XL_i	−	−0.0139	−0.0507**	−0.0675***	−0.0737**
B_3	$Size_i$	+/−	−0.0105**	−0.0112***	−0.0119***	−0.0043***
B_4	ROE_i	+/−	−0.0002**	−0.0011***	−0.0006**	−0.0024***
B_5	$Beta_i$	−	−0.0330*	−0.0424**	−0.0458*	−0.0399
B_6	$Score_i^*$ XL_i	+/−	−0.0025	−0.0063	−0.0014	−0.0029
B_7	$PCRev_i$	−	−0.0053*	−0.0052**	−0.0049*	−0.0070*
R^2 adjusted			0.388	0.452	0.510	0.404

$Score_i$ is a 0–4 disclosure rating consisting of the financial items C, D, E, and/or F, as discussed in Table 1. See Table 4a for description of other variables. Number of observations = 37.
*Significant at $\alpha = 0.10$.
**Significant at $\alpha = 0.05$.
***Significant at $\alpha = 0.01$.

that shareholders interpret a high-level environmental commitment to be a signal of quality as argued by Surma and Vondra (1992). This high-level commitment suggests there is a long-term environmental management policy (Klassen & McLaughlin, 1996). Such a policy involves both the structural (plant and equipment) and the infrastructural (production planning, performance measurement, and product design) components of the company (Klassen & McLaughlin, 1996). A company with such a policy can be expected to have economic benefits associated with fewer cash outflows related to fines, penalties, and remediation expenditures and to be in a better position to deal with legislative changes that might arise after a major accident such as occurred at the Placer Dome mine. This could explain why, at a time of market distress, investors look to the environmental committee for assurance that a company is prepared to deal with a possible legislative backlash. This interpretation is consistent with the Blacconiere and Patten (1994) assertion that investors interpret environmental information as a positive signal. Furthermore, if high-level assurance performs the same authentication function for environmental disclosure as it performs for financial disclosure (Mercer, 2004), the value-relevance of item B in the annual report is explained.

When $Score_i$ is defined using the full seven items (Table 4a), the coefficient is negative, but not statistically significant. One explanation for this finding is that CAR_i might be sensitive to the geographic location of mining activity, a factor that was not included in model (2). Some of the companies examined in this study had mining operations restricted to North America. Others had mining operations in central or South America, and some in Southeast Asia, or Africa. In a separate regression (not shown here), the sensitivity of CAR_i to location of mining activity was assessed, but there was no evidence of a significant correlation between the two variables. Another explanation for the absence of a statistically significant association could be the diversity of items in the seven-item score variable. It is possible that some disclosure items are in effect offsetting each other in terms of their impact on share behavior. That is, the positive share price impact of item B disclosure is possibly counteracting the negative price impact of other disclosures.

Freedman and Stagliano (1991) traced the signal content to the financial items in their study and argued that financial information disclosure reduces investor uncertainty. However, when $Score_i$ was defined to include only the financial items in this current study, the coefficient was statistically significant and negative (Table 4c). The finding of a negative association

of financial disclosure with share price conflicts with the Freedman and Stagliano findings and with the Campbell et al. (1998) argument that information which reduces uncertainty about environmental liabilities would have a favorable impact on share price.

If managers use environmental disclosure to signal superior knowledge and expertise, as Clarkson et al. (2008) suggest, it makes sense that this information would be communicated to help investors to assess the amount, timing, and uncertainty of future cash flows. The findings in Part II of this study therefore raise several questions. Why does disclosure of financial information not reduce investor uncertainty? Is it possible that investors do not interpret management's signal in the way that management intends? Are items C, D, E, and F, defined as they are to represent outlays for remediation costs, simply interpreted as bad news? Finally, is there a "disconnect" between the signal that management provides, and the way it is interpreted by the shareholders?

One explanation for the paradoxical findings in Part II could be that financial disclosures by Canadian companies are perceived to be biased. In her comparison of investor reaction to US versus Canadian disclosure, Bewley (2005) showed that a dollar of environmental liability disclosed by a Canadian company is discounted more heavily than a dollar disclosed by a US firm. She interpreted this to be the result of perceived bias in Canadian company disclosures arising from the discretionary nature of Canadian disclosure guidelines. If she is correct, then greater disclosure of financial items could indeed be interpreted as bad news, and not a positive signal to reduce investor uncertainty.

It is also possible that there are two signals, rather than one. The information that investors interpret to be a signal of management expertise may not be the same information that management uses for signaling purposes, assuming that signaling is a deliberate management strategy. In their study of 2003 annual report and 2004 website disclosure, Clarkson et al. (2008) found that companies with better environmental performance are more forthcoming with voluntary information, suggesting that signaling is indeed a deliberate strategy. The company with the high-level environmental commitment is likely to be in a position to make credible financial disclosures, which argues that item B and the financial disclosures should be part of the same management signal. And yet investors appear to be interpreting and responding to two separate messages. So the question arises: is there one signal, or are there two? And, is this dual-signal phenomenon a Canadian story? If so, this might explain why company executives in this country say their shares are undervalued,

despite the availability today of the expanded reporting guidelines of the GRI.

Another interpretation of the evidence in this study is that investors do not interpret the high-level commitment to be a signal of company value, but as a sign that management has engaged in activities that legitimize the company in light of societal expectations. Some of these activities could reduce companies' exposure to legislative repercussions. In fact, the presence of the committee could itself be a legitimating activity, and its existence need not necessarily be a true indication of superior environmental management. Proponents of signaling theory would argue that the costs of providing a false signal would prevent the company from engaging in this behavior (Toms, 2002; Spence, 1973). A logical extension to this current research would be to examine the correlation of the environmental commitment with actual environmental performance. If the companies with the commitment are indeed the better performers, they would be expected to make more credible disclosure. And if the companies with the commitment are the better performers, then the findings of this study suggest there is indeed a signaling paradox, at least in Canada, and so managers need to find a way to more clearly articulate their good news. On the contrary, if the companies disclosing high-level commitment are the poor environmental performers, the findings here suggest that shareholders interpret the financial disclosure as bad news, but their attentions are somewhat deflected by other information.

SUMMARY AND CONCLUSIONS

Prior literature has questioned the accuracy and usefulness of environmental disclosure. However, three event studies suggest that prior disclosure affects company value by signaling management expertise. The objective of this chapter is to review and extend some of this prior work. This chapter draws on signaling theory to examine share price reaction to an accident at a Placer Dome mine in 1996 that affected the Canadian mining industry. This chapter also examines the nature of environmental disclosure before the event. A PricewaterhouseCoopers survey in 2002/2003 suggests that mining company shares in Canada are undervalued. The findings of this chapter suggest the cause could be a mismatching of signals.

Part I of this research uses ESM to examine share prices in the wake of the Placer Dome accident. There is evidence that the accident triggered a

contagion effect that was reflected in a decline in share price across the Canadian mining industry. Part II incorporates a disclosure score to identify which elements of disclosure are value-relevant. The price decline was muted for companies that disclosed the presence of a high-level executive or board level committee responsible for environmental management. This finding supports the Klassen and McLaughlin (1996) assertion that senior level commitment is evidence that management has adopted a long-term orientation toward environmental management. Also this finding supports the survey evidence that shareholders respond favorably to the presence of a high-level management committee (Surma & Vondra, 1992). Further analysis shows, however, that investors reacted negatively to the disclosure of financial items. This evidence conflicts with the findings of Freedman and Stagliano (1991), who traced positive signal value to items of financial disclosure. These conflicting results may be the result of perceived bias in Canadian financial disclosure. Another possible explanation is that there are two signals, one sent from management, and a different one received by investors. This miscommunication could be one of the underlying causes affecting share price.

NOTES

1. The beta stability question was examined in the (Magness, 2008) study of the Mitchell, Agle, and Wood (1997) framework that explores the issue of stakeholder salience. That paper uses the same companies as those examined in the current study. That paper (currently under review) tests for beta stability at the time of the accident in Guyana and again when the Placer Dome accident occurred. The portfolio beta and all but three of the individual company betas experienced a statistically significant change at the time of the second accident. All changes were downward, suggesting an at least temporary decline in correlation with the overall market. These findings are in keeping with the evidence in Klassen and McLaughlin (1996) and Moreschi (1988) and with the interpretation that there was at least temporary decoupling of company from market returns while investors adjusted to the introduction of new information into the market.

2. Pre-event abnormal returns were examined to address concerns raised by Frankfurter and McGoun (1993, 1995). These authors were critical of research employing event study methodology. One of their stated reasons was that it is not abnormal at all for share prices to exhibit this form of behavior. Therefore, if any share under study displayed ''abnormal behavior'' before the ''event,'' then no conclusions can be drawn if ''abnormal behavior'' is observed afterward. Most of the authors who employ event study methodology do not examine residuals before day 0, and therefore do not address this concern. (An exception is when the event

under consideration is an information announcement. In this case there is always the possibility of an information leak. Authors have been known to test pre-event residuals in these studies.)

3. Unweighted scores such as this were used by Blacconiere and Patten (1994) and Blacconiere and Northcut (1997) in an effort to assess share response to quantity of information disclosed. Other disclosure studies employ weighted scores that award higher points to information that is quantified, specific, and verifiable, as opposed to information containing vague statements that need not necessarily reflect any actual action on the company's part. See, for example, Wiseman (1982) and Al-Tuwaijri, Christensen, and Hughes (2004) for examples where three points are awarded for quantified information, two points to nonquantitative but specific information, and one point to general qualitative information items. Where a weighted score is used, the higher scores are more likely to reflect disclosure of useful (quantified) information. This cannot be guaranteed, however. A document with a sufficient number of low value items could have a score that exceeds that of a document containing just one or two high value items. This problem can be overcome by assigning unweighted score items to subscores, with each subscore defined according to content such as quantified, voluntary, mandatory, etc. For example Barth, McNichols, and Wilson (1997) began with a 13-item unweighted score in the initial application of their statistical model and then used subscores in four reiterations of the analysis. The benefit of the unweighted index is that it is simple to apply, and the use of subscores obviates the need to weight any of the individual items.

ACKNOWLEDGMENTS

The author likes to thank Ryerson University's Ted Rogers School of Management for funding this research and Prof. Deirdre Taylor CGA for her assistance with data collection.

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SUSTAINABILITY REPORTING AND PERCEPTIONS OF CORPORATE REPUTATION: AN ANALYSIS USING *FORTUNE* MOST ADMIRED SCORES

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ABSTRACT

In this chapter, we investigate whether the first-time issuance of a standalone corporate sustainability report led to changes in reputation as measured by Fortune *Most Admired scores. Based on a sample of 59 U.S. companies issuing their first standalone sustainability report over the period from 2001 to 2007, and controlling for the financial "halo effect" reported by Brown and Perry (1994), we find, on average no significant changes in reputational scores. However, cross sectional analysis shows that issuing companies from socially exposed industries experienced decreases in scores. Further, report quality, at least at the extremes appears to be positively related to changes in perceived reputation. These results are consistent with Godfrey's (2005) arguments with respect to corporate reputation.*

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 83–104

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004007

INTRODUCTION

As noted by Adams and Narayanan (2007, p. 70), "the issue of sustainability is one that is increasingly important for organizations around the world." A growing number of corporations have begun reporting on their attempts to deal with this issue through the use of standalone sustainability reports (PricewaterhouseCoopers, 2002; KPMG International, 2008).[1] Although, some suggest the practice appears to be due to increasing pressure from both internal and external stakeholders (Ballou, Heitger, & Landes, 2006, p. 65), proponents of the business argument for sustainability reporting claim a significant potential benefit to issuing a report is the enhancement of the disclosing firm's reputation. Accordingly, the intent of this examination is to identify whether the first-time issuance of a standalone sustainability report results in changes in one widely recognized measure of corporate reputation – *Fortune* magazine's annual survey of America's most admired companies.

Based on a sample of 59 U.S. firms issuing their first standalone sustainability report over the period 2001–2007, inclusive, and controlling for the "financial performance halo" reported by Brown and Perry (1994) for *Fortune* Most Admired scores, we find that perceptions of corporate reputation, on average, did not improve following the release of the reports. However, cross-sectional analyses indicate significant differences in the impact on perceived reputation across two factors. First, we find that issuing companies from industries with social exposures experience decreased reputational scores relative to other releasing firms. Second, we find that the quality of the sustainability report (based on a content analysis of the extent of environmental and social indicator information included), at least at the extremes, is positively associated with reputational effects. Companies with the highest (lowest) quality reports exhibit significantly more positive (negative) reputation scores than other first time issuers. These findings suggest that only the highest quality reports improve reputation, and those efforts that are viewed as disingenuous (issuances of low quality and those from companies in socially exposed industries) appear to erode reputational capital. These results are consistent with Godfrey's (2005) arguments with respect to corporate reputation.

It is important to note that the *Fortune* scores are based on surveys of corporate executives, directors, and financial analysts. As such, our study does not investigate whether the issuance of a sustainability-type report influences perceptions of reputation for other stakeholder groups.[2] Unfortunately, we are aware of no broad measures of corporate reputation that might

be used to capture impacts across other potentially affected parties. Further, our study does not address the potential value of the reports as tools to protect, rather than enhance corporate reputation. We begin our chapter with the development of our hypotheses.

BACKGROUND AND HYPOTHESES DEVELOPMENT

Corporations have long used their annual reports as a medium for the disclosure of social and environmental information (see Ernst & Ernst, 1978; Patten, 1995). However, as noted by Bebbington, Larrinaga, and Moneva (2008), Erusalimsky, Gray, and Spence (2006), and others, there has been a dramatic increase in the publishing of standalone corporate sustainability reports over the past decade. Indeed, KPMG International, in its 2008 survey of corporate social responsibility and sustainability reporting, claims that "nearly 80 percent of the largest 250 companies worldwide" are now issuing such reports (KPMG International, 2008, p. 13). Perhaps not surprisingly given the breadth of this disclosure growth, there is considerable interest in the academic community to better understand what motivates corporations to report on their sustainability issues (Adams, 2002; Adams & McNicholas, 2007; Bebbington et al., 2008).

Our study focuses exclusively on what has been referred to as "the business case[3] for sustainability reporting" (Adams & Narayanan, 2007, p. 70). Proponents of this view emphasize that substantial pragmatic benefits can accrue from reporting on sustainability issues. Group of 100[4] in its report on sustainability reporting guidelines (Group of 100, 2004, pp. 14–16), for example, argues these potential positive outcomes include attraction and retention of high-caliber employees, establishing a position as a preferred supplier, and establishing a sound basis for stakeholder dialogue, among others. One of the benefits noted most consistently by the business case supporters, however, is the potential for sustainability reporting to enhance corporate reputation. To illustrate, Group of 100 (2004, p. 14) stresses that "effective communication with stakeholders … can play an important role in managing stakeholder perceptions, and, in doing so, protect and enhance corporate reputation." Similarly, the Global Reporting Initiative (GRI), the organization perhaps most acknowledged as the leader in the development of sustainability reporting guidelines (Ballou et al., 2006; Gray, 2006; Woods, 2003), claims reporting can lead to brand and reputation enhancement (www.globalreporting.org).

Finally, KPMG International (2008, p. 10) notes that "corporate responsibility reporting is building value for companies in many ways," including "enhancing reputation by providing truthful and robust information on tough issues."

Corporate managers also appear to believe that reputation enhancement is a strong benefit of sustainability reporting. PricewaterhouseCoopers (2002, p. 7), for example, reports that 53 percent of the 140 U.S.-based companies, it surveyed, cited reputation enhancement as a key driver in the expected growth in sustainability reporting. Mirroring that result, KPMG International (2008, p. 20) noted that more than half of its survey respondents also cited reputation or brand enhancement as an underlying reason for the issuance of a sustainability report.

Enhancing corporate reputation can lead to substantial business benefit. Gardberg and Fombrun (2006, p. 331), for example, suggest that higher levels of what they refer to as reputational capital allow companies "to negotiate more attractive contracts with host governments, to attract potential employees, to charge premium prices for their products and to reduce their cost of capital." However, Godfrey (2005, p. 784), in discussing the use of philanthropic giving as a means for improving corporate reputation, argues that in order for an act to generate positive reputational capital it must meet two criteria. First, there must be consistency between the act's underlying ethical value and the ethical values of the community. Second, according to Godfrey (2005, p. 784), the act must not be perceived as merely an attempt to "ingratiate the firm among the impacted community." Only acts perceived to be genuine manifestations of the firm's underlying character can improve reputation. Indeed, Godfrey (2005, pp. 784–785) further argues that because acts perceived as ingratiating attempts to garner favor tend to be viewed as morally negative, they can actually lead to an erosion of reputational capital.

There is substantial evidence that society is demanding corporations to be more socially responsive (see Ballou et al., 2006). As such, the choice to begin reporting on sustainability issues would appear to be in line with the values of society. Of course, our measure of reputation, *Fortune* Most Admired scores, is derived from a sample limited to corporate executives, directors and financial analysts. A case might be made that the beliefs of this group regarding corporate social responsibility differ from society's beliefs in general and thus represent an inconsistency between the act of sustainability reporting and its effect on the audience's perception of the reporting firm's reputation. However, as noted earlier, corporate managers appear to be well aware of the potential for sustainability reports to influence reputation.

Whether sustainability reporting is perceived as a genuine manifestation of firms' underlying social responsiveness is more debatable. Corporate social reporting, largely due to its voluntary nature, has been criticized as being both trivial (Gray, 2006) and disingenuous (Aras & Crowther, 2009). Therefore, on average, it is not clear whether the choice to begin issuing sustainability reports will indeed increase the reputational capital of disclosing firms.

We believe that two factors might influence the perception that a sustainability report issuance is a genuine action of social responsiveness or merely a disingenuous attempt to garner favor. These are the industry sector of the issuing firm and report quality. Proponents of the legitimacy theory of social disclosure (Cho & Patten, 2007; Deegan, 2002; Hackston & Milne, 1996; Patten, 2002) argue that companies in industries facing higher levels of exposure to the public policy process have an incentive to address these exposures through the use of social and environmental disclosure. As argued by Cho and Patten (2007), for example, rather than being a meaningful attempt at social accountability, this disclosure is used to project an image of social responsiveness that may not correspond with actual social performance. As such, if audiences perceive sustainability reports from companies in industries facing greater social exposures as self-serving efforts at reducing political pressures, the reports are more likely to be viewed as disingenuous.

We also believe that report quality might be expected to influence the perception of the issuance of a sustainability report as being disingenuous. As noted earlier, sustainability reporting is voluntary in nature and as such many of the issuances tend to be partial and fairly trivial (Gray, 2006; Gray & Bebbington, 2007). Indeed, Burson-Marsteller (2003), based on a survey of nongovernmental organizations (NGOs), reports that fewer than half of its respondents found corporate sustainability reports believable. It was also found, however, that comprehensive performance metrics and standardization of reporting boosted NGO confidence in the information being disclosed. As such, it seems likely that reports with substantial meaningful social and environmental disclosure would be more likely to be perceived as genuine attempts at social responsiveness and would thus be more likely to lead to positive reputational impacts. In contrast, the issuance of a report with little actual quality may instead be viewed as a disingenuous action, and might actually erode, rather than build reputational capital.

Although a number of prior studies investigate the impact of social or environmental disclosure on market returns (Anderson & Frankle, 1980; Blacconiere & Patten, 1994; Ingram, 1978), research of the relation between sustainability disclosure and the perceived reputation of disclosing firms is

very limited. Toms (2002) reports a positive relation between levels of corporate social responsibility disclosure[5] and measures of corporate reputation for a sample of U.K. firms. Recently, Bebbington et al. (2008) examine whether disclosures included in Shell's 2002 report on meeting the energy challenge (a sustainability-type report) are consistent with a reputation risk management motivation. Bebbington et al. report their analysis suggests that such an argument is plausible, but warn their results likely are not generalizable (p. 355). We are aware of no studies that examine whether changes in sustainability reporting practices influence subsequent perceptions of reputation. In order to fill that void, we examine whether the first-time issuance of a corporate sustainability report leads to changes in the perceived reputation of the companies making the release. We focus on first time reports because we believe the choice to issue a separate report signals a definitive shift in disclosure policy for the firm. If the business case for sustainability reporting holds, the choice to begin reporting would be expected to influence positively perceptions of reputation. If, however, the act fails to meet the criteria identified by Godfrey (2005), it would not. Largely, the question of whether or not, on average, the choice to issue a sustainability report impacts the perception of the reporting firm's reputation seems to be an empirical one. As such, we formally state our first hypothesis (in null form) as

Hypothesis 1. The first-time issuance of a sustainability report will have no impact on the perception of the firm's reputation.

Godfrey (2005) argues that in order to increase reputational capital, acts must be perceived as genuine manifestations of a company's social responsiveness, and to the extent that stakeholders perceive corporate social responsibility related actions to be disingenuous, such actions will likely negatively impact the social reputation of the firm. As such, we expect the reputational effects of first-time sustainability report issuance to be negatively related to membership in a socially exposed industry and positively associated with report quality. We formally state these hypotheses (in alternative form) as

Hypothesis 2. Ceteris paribus, changes in reputation following the issuance of a standalone sustainability report will be more negative for firms from industries facing greater social exposures than for those from industries with less exposure.

Hypothesis 3. Ceteris paribus, changes in reputation following the issuance of a standalone sustainability report will be positively associated with report quality.

RESEARCH METHODS AND RESULTS

Sample Selection

To be included in our analysis, sample firms had to meet the following criteria:

1. They had to be a U.S.-based corporation with a first-time issuance of a standalone sustainability report over the period 2001–2007, inclusive.
2. They had to have *Fortune* Most Admired scores for both the year immediately preceding and immediately following the release of the report.
3. They had to have all required data available on the Research Insight database.
4. Their sustainability report had to be available for analysis.

Based on a review of CorporateRegister.com, *Academic Universe Lexis-Nexis*, and the corporate websites for firms included in the 2007 *Fortune* 500 listing, we identified 65 companies with first-time issuances of a standalone sustainability report over our period of investigation that also had the required Most Admired scores available. However, two of these firms lacked necessary financial data and were deleted from the analysis. Further, we were unable to access the sustainability report for four of these companies. Our final sample, therefore, consists of 59 firms. Table 1 identifies our sample companies, whereas Tables 2 and 3 present descriptive statistics and Pearson product–moment correlations, respectively, for variables included in our analysis (discussed later).

Fortune Most Admired Scores

Since 1983, *Fortune* magazine has been publishing a listing of the most admired corporations in America. *Fortune* also includes a listing of corporate Most Admired scores. As noted by *Fortune* (2006, p. 86), the scores are based on a survey of executives, directors, and financial analysts, and are claimed to be "the definitive report card on corporate reputations." Respondents are asked to rank each of the 10 largest firms within more than 60 different industry groups on 8 factors; quality of management, quality of products or services, long-term investment value, innovativeness, financial soundness, people management, social responsibility, and wise use of corporate assets. Consistent with prior studies (e.g., Chakravarthy, 1986; McGuire, Sundgren, & Schneeweis, 1988; Williams & Barrett, 2000) we use the Most Admired scores as a measure of corporate reputation.

Table 1. Sample Firms.

Company	Report Year	SEI Firm[a]
Accenture	2006	No
AIG	2007	No
Avon Products	2005	Yes
Becton Dickinson	2004	No
Bemis Company	2005	Yes
Brown-Forman	2007	Yes
Caterpillar, Inc.	2006	No
Chiquita Brands	2001	No
Cisco Systems	2005	No
CitiGroup	2001	No
Colgate-Palmolive	2004	Yes
Continental Airlines	2007	No
Cummins Inc.	2001	No
Deere & Co	2007	No
Devon Energy	2007	Yes
Duke Energy	2007	No
EMC Corporation	2007	No
GAP	2004	No
General Electric	2005	No
Grainger	2007	No
Johnson Controls	2003	No
Kroger Company	2006	No
Lennar Corporation	2006	No
Lexmark International	2004	No
Lockheed Martin	2005	Yes
Lowes	2004	No
Manpower	2007	No
Marriott International	2007	No
Masco Corporation	2004	No
McDonald's	2002	No
Merck & Company	2005	Yes
Morgan Stanley	2001	No
Newmont Mining	2002	Yes
News Corporation	2007	No
Nike	2001	No
Oracle Corporation	2006	No
Peabody Energy	2006	Yes
Praxair	2003	Yes
ProLogis	2007	No
Prudential Financial	2006	No
Sabre Holdings	2006	No
Solectron	2001	No
Sprint Nextel	2007	No
Starbucks	2002	No

Table 1. (*Continued*)

Company	Report Year	SEI Firm[a]
Sysco	2007	No
Temple-Inland	2001	Yes
Tyco International	2005	No
Tyson Foods	2006	No
United Parcel Service	2003	No
United Technologies	2005	Yes
UnitedHealth Group	2007	No
Unum Group	2002	No
Verizon Communications	2005	No
Visteon Corporation	2004	No
Wal-Mart Stores, Inc.	2007	No
Washington Mutual	2002	No
Wellpoint, Inc.	2005	No
Wells Fargo & Co	2006	No
Xerox	2006	No

[a]SEI, firms from social exposure industries.

Table 2. Descriptive Statistics.

	Mean	Maximum	Minimum
Score – prior[a]	6.6870	9.0400	3.7700
ROA[b]	5.9081	18.3750	−4.4017
MV/BV[c]	4.0769	28.8649	0.2087
Sales[d]	23.5255	26.7178	21.2338
Growth[e]	0.1351	0.6136	−0.1111
Risk[f]	1.6005	15.6571	0.0003
Score – post[g]	6.6442	8.5000	4.1100
Unexpected score[h]	−0.0187	1.6500	−2.0800
RQS[i]	10.3400	27.0000	1.0000
SEI[j]	0.2000	1.0000	0.0000

[a]Firm *i*'s Most Admired score, year before release of first-time sustainability report.
[b]Firm *i*'s average 3-year ROA starting at time *t* through year *t*−2.
[c]Firm *i*'s market value divided by firm *i*'s book value at time *t*.
[d]The natural log of firm *i*'s revenues at time *t*.
[e]Firm *i*'s average 3-year change in the natural log of revenues from time *t* through year *t*−2.
[f]Firm *i*'s debt divided by firm equity at time *t*.
[g]Firm *i*'s Most Admired score, following release of first-time sustainability report.
[h]Difference in actual most admired score minus predicted Most Admired score for period *t*.
[i]Firm *i*'s report quality score at time *t*.
[j]SEI_i is a one/zero indicator variable where 1 signifies firm *i* is from a socially exposed industry.

Table 3. Pearson Correlation Firm's Most Admired Scores, Report Quality Scores, Halo Variables controlling for industry ($n = 59$).

	Score – Prior	ROA	MV/BV	Sales	Growth	Risk	Score – Post	Unexpected Score	RQS	SEI
Score – prior[a]	–									
ROA[b]	0.204	–								
MV/BV[c]	0.186	0.563***	–							
Sales[d]	0.370***	−0.118	−0.098	–						
Growth[e]	0.223	−0.092	−0.069	0.130	–					
Risk[f]	0.144	−0.366***	0.168	0.102	0.045	–				
Score – post[g]	0.843***	0.259**	0.192	0.269**	0.208	0.105	–			
Unexpected score[h]	0.713***	0.042	−0.047	0.009	0.078	−0.111	0.880***	–		
RQS[i]	0.070	0.294**	0.184	0.079	−0.388***	−0.180	0.134	0.141	–	
SEI[j]	−0.212	0.264**	0.350***	−0.352***	−0.223	−0.094	−0.241	−0.211	0.102	–

**, ***significant at 0.05 and 0.01 level of significance, respectively (two-tailed).

[a]Firm *i*'s Most Admired score, year before release of first-time sustainability report.

[b]Firm *i*'s average 3-year ROA starting at time *t* through year *t*–2.

[c]Firm *i*'s market value divided by firm *i*'s book value at time *t*.

[d]The natural log of firm *i*'s revenues at time *t*.

[e]Firm *i*'s average 3-year change in the natural log of revenues from time *t* through year *t*−2.

[f]Firm *i*'s debt divided by firm equity at time *t*.

[g]Firm *i*'s Most Admired score, following release of first-time sustainability report.

[h]Difference in actual Most Admired score minus predicted Most Admired score for period *t*.

[i]Firm *i*'s report quality score at time *t*.

[j]SEI_i is a one/zero indicator variable where 1 signifies firm *i* is from a socially exposed industry.

Controlling for the Halo Effect

As noted earlier, the *Fortune* Most Admired scores are based on measures across eight different aspects of corporate value, several of which are largely based on financial performance. As such, changes in the scores might be expected to be affected by changes in what Brown and Perry (1994) refer to as ''the halo effect'' of financial performance. The authors note that the halo must be removed before the *Fortune* surveys can be used in academic research related to corporate responsibility (p. 1347). Accordingly, we employ the technique presented in Brown and Perry (1994) to remove the halo effect from our sample before we begin our main analysis. First, we estimate the effect of the halo financial variables identified by Brown and Perry (1994) on the score measures for our sample firms in the period before the issuance of its sustainability report.[6] More specifically, we estimate the following multiple regression model (variables are defined in Table 4):

$$\text{Score} = \alpha_0 + \beta_1 \text{ROA} + \beta_2 \text{MV/BV} + \beta_3 \text{Sales} + \beta_4 \text{Growth} + \beta_5 \text{Risk} + \varepsilon$$

As presented in Table 4, the overall model is significant with an adjusted R^2 of 0.179. The halo variables are statistically significant (at $p < .07$ or better, two-tailed), except for market-to-book and risk. There are two possible reasons why these two variables might not be significant in our setting. First, we examine very large firms and these companies are generally less risky than most other firms. Additionally, it is possible that this measure of risk contains some noise. For instance, whereas this model uses an unadjusted debt-to-equity ratio, other studies use different measures of risk such as earnings volatility. Second, Brown and Perry (1994) use an industry-adjusted measure of market-to-book. We use an unadjusted measure of market-to-book. Given the overall significance of our model, we proceed with our analysis.[7]

Impact on Reputation

Using the parameter estimates from Table 4 and financial data from period t, we predict the scores of our sample firms for the period following release of their sustainability reports.[8] We use these predicted or expected scores to test our first hypothesis. Specifically, we test for differences in the means of the sample firms' actual Most Admired scores as reported by *Fortune* for period t and scores we expect given the companies' year t

Table 4. Multiple Regression Results for the Predicting Relation between Sample Firms' Most Admired Score and Halo Variables.

The regression model is stated as:

$$\text{Score}^{a} = \alpha_0 + \beta_1 \text{ROA} + \beta_2 \text{MV/BV} + \beta_3 \text{Sales} + \beta_4 \text{Growth} + \beta_5 \text{Risk} + \varepsilon$$

Variable	Expectation	Parameter Estimate	*t*-Statistic	Significance (*t*-Statistic)[b]
Constant	None	−1.300	−0.499	0.620
ROA[c]	(+)	0.062	1.864	0.068
MV/BV[d]	(+)	−0.004	−0.244	0.809
Sales[e]	(+)	0.312	2.823	0.008
Growth[f]	(+)	1.660	2.099	0.042
Risk[g]	(−)	0.055	1.508	0.138
Adjusted R^2	0.179			
F-Statistic	3.524			
Prob > *F*	0.008			
N	59			

[a]Firm *i*'s Most Admired score at date of interest (*t*).
[b]Significance levels are two-tailed for all variables.
[c]Firm *i*'s average 3-year ROA starting at time *t* through year *t*−2.
[d]Firm *i*'s market value divided by firm *i*'s book value at time *t*.
[e]The natural log of firm *i*'s revenues at time *t*.
[f]Firm *i*'s average 3-year change in the natural log of revenues from time *t* through year *t*−2.
[g]Firm *i*'s debt divided by firm equity at time *t*.

Table 5. Results of Univariate *t*-Tests on the Actual versus Predicted Most Admired Scores Controlling for Halo Variables.

	Mean Score	*t*-Statistic	Significance[a]
Predicted Most Admired score	6.663		
Actual Most Admired Score	6.644	−0.120	0.905

[a]Significance level is two-tailed.

financial data. As reported in Table 5, our mean predicted Most Admired score is 6.663. The mean of the actual Most Admired scores for period *t* is 6.644. The difference between actual and predicted mean scores is statistically not different from zero (*t-stat* = −.120 and *significance level* = .905, two-tailed).[9] Table 5 results thus indicate that we did not find a difference in reputation following the issuance of a sustainability report.

Cross-Sectional Analyses

We begin our cross-sectional analysis by partitioning our sample into two groups; firms from socially exposed industries (SEI) and firms from other industries (Non-SEI). Following Brammer and Millington (2005), we classify firms from the chemical, paper, extractive, pharmaceutical, alcoholic beverages, and defense industries as being socially exposed. As noted in Panel A of Table 6, 12 of our sample firms are classified as SEI and the remaining 47 are Non-SEI companies. We test for differences in the mean unexpected scores for these two groups. Based on the results presented in Table 6, we find support for Hypothesis 2. Although the actual Most Admired scores for the Non-SEI firms are, on average, slightly higher than predicted, the mean difference between the actual and predicted scores for SEI companies is −0.384 (actual scores are lower than predicted). The difference in the unexpected mean scores across the two groups is statistically significant ($p = .059$, one-tailed). These results are consistent with the release of a sustainability report by SEI firms being perceived as disingenuous, thus producing negative reputational effects.

We next examine whether report quality impacts differences in the change in the reporting firm's perceived reputation. Specifically, we hypothesize that firms issuing higher quality reports will experience more positive reputational effects than companies releasing lower quality reports. We used content analysis to assess the quality of our sample companies' sustainability reports. Content analysis has been used extensively in social and environmental disclosure research to proxy the quality of information disclosures

Table 6. Tests for Differences in Unexpected Most Admired Scores across Socially Exposed Industries and Report Quality Scores.

	Mean Difference	*t*-Statistic	Significance
Panel A – Firms in socially exposed industries versus others			
SEI ($n = 12$)	−0.384		
Non-SEI ($n = 47$)	0.075	−1.649	0.059[a]
Panel B – Report quality scores (high designates companies with RQS above the mean)			
RQS – high ($n = 27$)	−0.042		
RQS – low ($n = 32$)	0.001	−0.180	0.858[b]

Mean Unexpected Score = Actual Most Admired Score−Predicted Most Admired Score
[a]Significance level is one-tailed.
[b]Significance level is two-tailed.

(see Blacconiere & Patten, 1994; Freedman & Wasley, 1990; Wiseman, 1982). It requires reviewing the document for the presence or absence of disclosure across selected areas of information. Because, as argued by Ballou et al. (2006, p. 66), the GRI is viewed as having issued the most dominant reporting regulations in the social and environmental arena, we rely on the GRI recommendations as our measure of quality. More specifically, based on a review of the GRI's G2 and G3 reporting guidelines, we developed a coding scheme identifying 55 environmental and social performance indicators (see appendix). Twenty-four of the items relate to environmental information with the remainder classified as social disclosures. One member of the research team reviewed each of the sample reports for the presence or absence of disclosure across each of the indicators and one point was awarded for each area of disclosure. To assure accuracy of the coding, reports were then independently reviewed by a second member of the research team. All discrepancies were discussed and reconciled by the research team. Report quality scores ranged from 1 to 27 with a mean (median) of 10.34 (10).

Failing to support Hypothesis 3, the correlation between report quality and unexpected Most Admired scores is not statistically significant ($r = .141$, $p = .144$, one-tailed). Similarly, differences in mean unexpected reputation scores for higher quality issuers (report quality scores above the mean) versus lower quality reporters (report quality scores below the mean) are also not significantly different. As reported in Panel B of Table 6, the mean unexpected reputation scores are nearly identical (−.042 versus .001). However, an examination of differences in reputation effects for firms with reports at the extremes of the quality continuum (Table 7) presents evidence in support of Hypothesis 3. The mean unexpected reputation score for the eight companies with report quality scores more than one standard deviation above the mean (report quality score >17) is a positive .456 in contrast to the negative .390 mean for the 7 firms with quality report scores more than one standard deviation below the mean (scores of three or less). This difference is statistically significant at $p = .020$, one-tailed (see Panel B of Table 7). Further, as reported in Panels C and D of Table 7, in comparison to all other sample companies, the highest quality report issuers' unexpected reputation scores are significantly higher (at $p = .051$, one-tailed) whereas the lowest quality report issuers' scores are significantly lower (at $p = .054$, one-tailed). Thus, at least at the extremes, report quality appears to influence the impact on reputation as measured by *Fortune* scores.

Table 7. Tests for Differences in Unexpected Most Admired Scores across Report Quality.

	N	Mean Unexpected MA Score
Panel A – Descriptive information		
RQS – high (RQS ≥17)	8	.456
RQS – middle (3<RQS <17)	44	−.046
RQS – low (RQS ≤3)	7	−.390

	Mean Difference	*t*-Statistic	Significance[a]
Panel B – High-quality reporters versus low-quality reporters			
RQS – high ($n = 8$)	0.456		
RQS – low ($n = 7$)	−0.390	−2.319	0.020
Panel C – High–quality reporters versus all others			
RQS – high ($n = 8$)	0.456		
RQS – all others ($n = 51$)	−0.093	1.660	0.051
Panel D – Low-quality reporters versus all others			
RQS – low ($n = 7$)	−0.390		
RQS – all others ($n = 52$)	0.031	−1.743	0.054

Mean Unexpected Score = Actual Most Admired Score−Predicted Most Admired Score.
[a]significance level is one-tailed.

Regression and Supplemental Analysis

To support the univariate results presented in Tables 6 and 7, we estimate the following model:

$$\text{Unexpected Score}_i = \alpha_0 + \beta_1 \text{RQS}_i + \beta_2 \text{SEI}_i + \varepsilon$$

Where Unexpected Score_i equals firm *i*'s actual Most Admired score following release of the sustainability report minus its predicted Most Admired score; RQS the content analysis score for firm *i*'s sustainability report; and SEI_i a one/zero indicator variable where 1 indicates that firm *i* is from a socially exposed industry. As shown in Table 8, β_1 is positive, but not statistically significant at conventional levels ($p = .106$, one-tailed), whereas β_2 is negative and statistically significant ($p = .042$, one-tailed).[10] These results appear to confirm that the impact of report quality on perceived reputation is limited to the extremes. However, controlling for report quality, we continue to find that issuers from socially exposed industries appear to suffer negative reputational effects.

Table 8. Multiple Regression Results.

The regression model is stated as[a]:

$$\text{Unexpected Score}_i = \alpha_0 + \beta_1 \text{RQS}_i + \beta_2 \text{SEI}_i + \varepsilon$$

Variable	Expectation	Parameter Estimate	*t*-Statistic	Significance (*t*-Statistic)[b]
Constant	None	−0.144	−0.673	0.504
RQS	(+)	0.022	1.266	0.106
SEI	(−)	−0.495	−1.758	0.042
Adjusted R^2	0.038			
F-Statistic	2.143			
Prob > *F*	0.127			
N	59			

[a]Unexpected score$_i$, difference in actual Most Admired score minus predicted Most Admired score for period *t*. RQS$_i$, firm *i*'s report quality score at time *t*. SEI$_i$, is a one/zero indicator variable where 1 signifies firm *i* is from a socially exposed industry.
[b]Significance levels are one-tailed for the RQS and SEI variables.

LIMITATIONS AND CONCLUSIONS

Standalone corporate sustainability reporting has risen dramatically over the past decade, and so, too, has interest in what underlies a company's choice to begin the practice. In this study, we investigate one of the major factors cited by proponents of the business case for sustainability reporting, the potential for increasing the perceived reputation of the reporting firm. Based on a sample of 59 U.S.-based corporations issuing their first standalone sustainability report, we find that, on average, reputation, measured using *Fortune* Most Admired scores controlled for Brown and Perry's (1994) financial halo effects, was not changed. However, we find that, relative to other companies, firms from industries with greater social exposure appear to suffer negative reputational effects to the issuance of a sustainability report. Similarly, we find that the unexpected reputation scores for companies issuing low-quality reports are significantly more negative than the scores for firms with high-quality issuances. These findings are consistent with Godfrey's (2005) argument that attempts at garnering favor that are perceived as disingenuous may actually erode reputational capital. Finally, our results suggest that only the highest quality sustainability reports appear to positively enhance corporate reputation.

Of course, our study is not without limitations, the *Fortune* Most Admired scores are based on survey results of corporate executives, directors, and

financial analysts. Although this group is perhaps a good proxy for the financial stakeholders of a corporation, it is plausible that they do not adequately reflect the perceptions of other stakeholder groups including employees, customers, and outside members of the society. Because many of the social and environmental aspects of sustainability reports address concerns associated with these other groups, it is possible that the choice to begin issuing a standalone report would have a more positive impact on perceptions of reputation across these stakeholders. Of course, it is also possible that these other stakeholders might interpret sustainability reporting, particularly low-quality reporting and issuances from companies in socially exposed industries, as disingenuous. Unfortunately, we are aware of no broad measures of corporate reputation that might be used to capture such impacts. It is also possible that, due to the financial focus of the participants in *Fortune*'s survey, the ethical perception of sustainability reporting is not consistent with the underlying ethical perceptions of the assessing group, which could explain why the practice, on average, does not lead to improved perceptions of reputation. Further evidence on how internal management views the practice of sustainability reporting (as called for by Adams, 2002, for example), thus seems warranted. Finally, it is possible that even within the limited stakeholder group captured by the *Fortune* surveys, the value of sustainability reporting with respect to reputation may lie more with protection, as opposed to enhancement (as in Bebbington et al., 2008). Our study does not address this issue.

NOTES

1. These reports are published under a number of differing names in, for example, "Social Responsibility Report," "Social and Environmental Report," "Corporate Citizenship Report," and "Sustainability Report," among others.

2. Tilt (2007), in her discussion of external stakeholders potentially targeted as audiences for sustainability reporting, includes consumers, suppliers, employees, trade unions, public interest groups, the media, and the general public. However, it is worth highlighting that Tilt also lists shareholders and investors as targets, and specifically discusses financial analyst use of social and environmental disclosure (p. 107).

3. Interested readers are referred to the following site for a discussion of the business case for sustainability reporting: http://www.kpmg.ca/en/industries/enr/energy/sustainabilityBusinessCase.html.

4. Group of 100 is an organization representing top management from 100 of Australia's largest corporations.

5. Toms (2002) focuses primarily on disclosures in firms' annual reports although, where issued, he also includes information from standalone environmental reports.

6. Although the *Fortune* scores are published in early March each year, the surveying takes place in the preceding October. As such, we classify prior and post scores relative to the surveying. We make an assumption that reports issued in October are not captured until the following year's survey. We repeated all analyses deleting the three sample companies with an October report issuance. In all cases, results remained qualitatively unchanged.

7. We repeat our predicted score analysis deleting the two insignificant halo variables. Results using this alternative measure are comparable to those reported in the chapter and are not included here.

8. This procedure effectively removes the halo effect from the scores used for our analysis. An underlying assumption of our approach is that the explanatory effect of the halo variables remains consistent across our two periods.

9. We repeat all tests of differences using nonparametric Mann–Whitney tests. In all cases, results, not reported in the chapter, are similar to those based on the parametric tests.

10. We also estimated this model using a SEI*RQS interaction variable. It was not statistically significant and is not reported with our results.

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APPENDIX. REPORT QUALITY DISCLOSURE CODING SCHEME

Area	Item	Page #
Env	*Environmental Performance Indicators*	
1	Material use	
2	Percentage of input that is recycled	
3	Discussion of recycling efforts	
4	Direct energy consumption	
5	Indirect energy consumption	
6	Energy saved due to conservation and efficiency	
7	Initiatives to reduce energy consumption	
8	Water use disclosures	
9	Water recycling	
10	Impacts on biodiversity-rich habitats	
11	Habitats protected or restored	
12	Strategies or plans for managing impacts on biodiversity	
13	Greenhouse gas emissions	
14	Initiatives to reduce greenhouse gas emissions	
15	Other emissions disclosure	
16	Wastewater disclosures	
17	Weight of waste and disclosure methods	
18	Disclosures of significant spills	
19	Hazardous waste disclosures	
20	Initiatives to mitigate env impacts of products/services	

APPENDIX. (*Continued*)

Area	Item	Page #
21	Product packaging impacts on the environment	
22	Fines and sanctions for environmental citations	
23	Impacts of transportation of goods or employees	
24	Environmental expenditures	
Soc	*Social Performance Indicators*	
1	Human rights screening on investment agreements	
2	Human rights screening on suppliers	
3	Employee training on human rights policies	
4	Diversity or nondiscrimination programs	
5	Policies on freedom of association/coll. Bargaining	
6	Policies on child labor	
7	Policies on forced and compulsory labor	
8	Training of security personnel on human rights	
9	Policies or programs on indigenous rights	
10	Total workforce by employee type or region	
11	Disclosures on employee turnover	
12	Discussion of significant benefit programs provided	
13	Employees covered by collective bargaining	
14	Minimum notice periods for operational changes	
15	Rates of work-related injury/illness/deaths	
16	Education/training on serious illnesses	
17	Average hours of training per employee	
18	Programs for skills management/career enhancement	
19	Percentage of employees receiving regulars reviews	
20	Ratio of basic salary of men to women	

APPENDIX. (*Continued*)

Area	Item	Page #
21	Impacts on communities	
22	Anticorruption programs and policies	
23	Discussion of public policy involvement	
24	Political contributions	
25	Policies regarding anticompetitive behavior	
26	Fines or sanctions for noncompliance	
27	Assessments of products or services for safety issues	
28	Product labeling requirements	
29	Practices related to assessing customer satisfaction	
30	Marketing-related laws and codes	
31	Policies regarding customer privacy	

ENVIRONMENTAL PROACTIVITY AND PERFORMANCE

Priscilla S. Wisner, Marc J. Epstein and Richard P. Bagozzi

ABSTRACT

Conceptually, management control of an organization requires managers to link decision making to strategic objectives and to link performance outcomes to the implementation of these decisions. However, it is often difficult to determine what management decision processes and actions are most effective in translating strategic objectives into achieved performance. Using data from a cross-section of industrial firms that have an explicit interest in environmental management, we present and test a model of environmental management control and performance that evaluates the associations between specific managerial actions, environmental proactivity, and environmental performance. Our results demonstrate a positive relationship between five specific management control actions and environmental proactivity, which is in turn positively associated with environmental performance. This study helps to define the concept of proactive environmental management through the identification of discrete managerial actions that link to proactivity and environmental performance outcomes.

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 105–127

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004008

1. INTRODUCTION

Firms embrace environmental management strategies for a number of reasons. Government regulation pushes firms to comply with environmental standards, thereby creating a need for companies to manage environmental performance outcomes. Pressure for good environmental performance is also exerted by various stakeholders including investors, customers, nongovernmental organizations, local communities, and employees. The investment community has recognized that environmental performance is closely linked to firm value. In *The Value Creation Index*, a 2000 study of intangible drivers of firm value by Cap Gemini Ernst & Young, environmental performance was ranked as a key intangible driver of firm value (Low, 2000). Klassen and McLaughlin (1996) reported significantly stronger stock market returns linked to environmental awards, and negative returns associated with firms experiencing environmental crises. Financial measures of firm value have also been significantly related to environmental liabilities (Barth & McNichols, 1994; Blacconiere & Northcut, 1997; Hughes, 2000) and to toxic emissions (King & Lenox, 2002). Customer demands are also driving firms to embrace better environmental management practices. Ford and General Motors (GM) have announced the requirement that their suppliers achieve certification for environmental management practices under ISO 14001 guidelines, and many other large organizations are following suit. From 1998 to 2004, ISO 14001 certifications increased more than 10-fold from just 7,887 certifications in 1998 to over 90,000 certifications issued in 2004 (ISO, 2004).

In addition to external pressures to better manage environmental performance, managers are also realizing that effective environmental performance leads to more favorable internal outcomes. The operational performance outcomes associated with implementing a proactive environmental strategy include reduced waste and discharges, increased efficiency, reduced energy and resource costs, lower risk and liability, better corporate reputation, and reduced compliance costs (Sharma & Vredenburg, 1998; Hart & Ahuja, 1996; Hart, 1995). Managers therefore commit substantial corporate resources toward implementing environmental management strategies. Rugman and Verbeke (1998) reported that 1–2% of firm revenues are allocated to environmental management expenditures. Actual environmental costs may be three-to-four times reported costs (Epstein, 1996). In the steel industry, Joshi, Krishnan, and Lave (2001) found that for every $1 of environmental costs explicitly accounted for, $8 to $10 of environmental costs were hidden in other accounts.

As environmental responsiveness has become a significant dimension in the strategies of many companies, top management has become more focused on how to effectively manage environmental performance (Ilinitch, Soderstrom, & Thomas, 1998). Therefore, as top management of companies embrace environmental management strategies, they need to understand what management control processes and actions best support the implementation of an environmental strategy and lead to improved environmental performance. However, in the field of environmental strategy research, there has been very little empirical research into the association between strategy, management control systems, and environmental performance (Sharma, 2000; Klassen & McLaughlin, 1996).

This study links the process of implementing an environmental strategy to the management control systems of organizations by evaluating specific management processes and actions that define proactivity and lead to better environmental performance outcomes. We test the relationship between seven managerial processes used by firms to manage environmental performance and the firm's degree of proactivity toward environmental management. We then test the relationship between proactivity at the firm level and the firm's environmental performance self-rating as compared to others in the industry. Using a sample of 179 U.S. firms representing a cross-section of industries, we develop and test a model of environmental performance that links specific managerial practices to environmental proactivity and that then associates proactive environmental management to environmental performance achieved at the firm level. Our study helps to define the concept of proactive environmental management through the identification of discrete managerial actions that define proactivity and that link into performance outcomes. Although our model and data are specific to implementing environmental management strategies, we believe that it generalizes to the implementation of other strategies as well.

The remainder of the chapter is organized as follows. The performance model is developed and described in Section 2. Section 3 describes the sample, measures, and analytical procedures used. Our results are reported in Section 4, followed by a discussion of the results and concluding remarks in Section 5.

2. THEORETICAL DEVELOPMENT

Although regulatory pressure commonly causes firms to focus management attention and resources on environmental performance outcomes, the

environmental management literature has described various stakeholders that exert pressures on companies to better manage their environmental performance (Henriques & Sadorsky, 1996; Neu, Warsame, & Pedwell, 1998; Buysse & Verbeke, 2002). Once top management recognizes a need for an environmental strategy, choices must be made about how to implement this strategy.

Many companies allocate substantial resources to managing environmental performance. Judge and Douglas (1998) evaluated the antecedents and effects of incorporating environmental management issues into strategic planning processes. They reported that the amount of resource allocation to environmental management and the functional integration of environmental issues within a firm positively impacted environmental and financial performance outcomes. Typologies of environmental strategy implementation range from "reactive" companies that generally commit minimal resources to environmental performance to comply with legal requirements, to "proactive" companies that actively manage their processes to minimize negative environmental impacts and generally exceed regulatory requirements (Hunt & Auster, 1990; Hart, 1995; Aragon-Correa & Sharma, 2003). Winn and Angell's (2000) matrix of "corporate greening" classifies firms according to their degree of commitment and action. At the lowest degree of corporate greening are those companies that have low commitment and are passive or reactive in planning and responsiveness. The greatest degree of corporate greening, "Deliberate Proactive Greening," is demonstrated by companies with a high degree of commitment and active/proactive planning and responsiveness culture. Proactive firms are further described as those in which environmental management is a priority for top management and where top management is actively involved in environmental management decision making (Hunt & Auster, 1990), which respond more decisively to environmental challenges and that anticipate environmental impacts of operations (Aragon-Correa, 1998). Consistent with the resource-based view of the firm (Barney, 1986, 1991), which says that firms gain competitive advantage according to how they develop and exert their organizational capabilities, companies that are more proactive toward environmental management have demonstrated positive outcomes in the creation of corporate value (Hart & Ahuja, 1996; Sharma & Vredenburg, 1998; Klassen & Whybark, 1999a; Aragon-Correa & Sharma, 2003).

As described in the aforementioned literature, environmental proactivity remains a somewhat abstract concept. However, in a study of environmental strategy implementation in Belgian firms, Buysse and Verbeke (2002) further identified five primary areas of proactive management attention to

environmental management: management systems and procedures, the strategic planning process, investments in green competencies, investments in employee skills, and organizational competencies. In this framework, firms classified as ''environmental leadership'' firms scored much higher in each of these dimensions than did firms classified as following ''reactive' strategies.

Management control systems are the systems for managing and influencing firm behavior (Flamholtz, Das, & Tsui, 1985; Langfield-Smith, 1997) and are described as the formal, information-based routines and procedures that are used by managers to maintain or alter patterns in an organization's activities (Simons, 1987). Building on the Buysse and Verbeke framework, we test the relationship between seven specific managerial processes and actions and environmental proactivity and then further test the association between environmental proactivity and environmental performance outcomes for a sample of companies that has recognized the need for environmental management. Although earlier research has reported a link between proactivity and performance (Wisner, Epstein, & Bagozzi, 2006), the construct of proactivity was linked to other broad organizational characteristics such as management commitment and strategic planning. In this study, we conceive of environmental proactivity as a function of the specific managerial actions that produce it. We identify and test specific processes and actions that define a proactive management control environment. We then test if proactivity is associated with better environmental performance outcomes. Our conceptual performance model is displayed in Fig. 1; in the following paragraphs we discuss the rationale for this model and our hypotheses.

2.1. Defining Environmental Proactivity

On the basis of the strategic and environmental management literatures, we have identified seven specific managerial control actions that manifest environmental proactivity:

1. *Resource commitment*. Abernethy and Brownell (1999) report that firms that follow an interactive style of budgeting, where the budgeting process is seen as a dialogue intended to create ideas and learning within the organization, are more effective at implementing strategic changes in the organization. Hunt and Auster (1990) define proactivist firms as those that freely commit resources to environmental management, as opposed

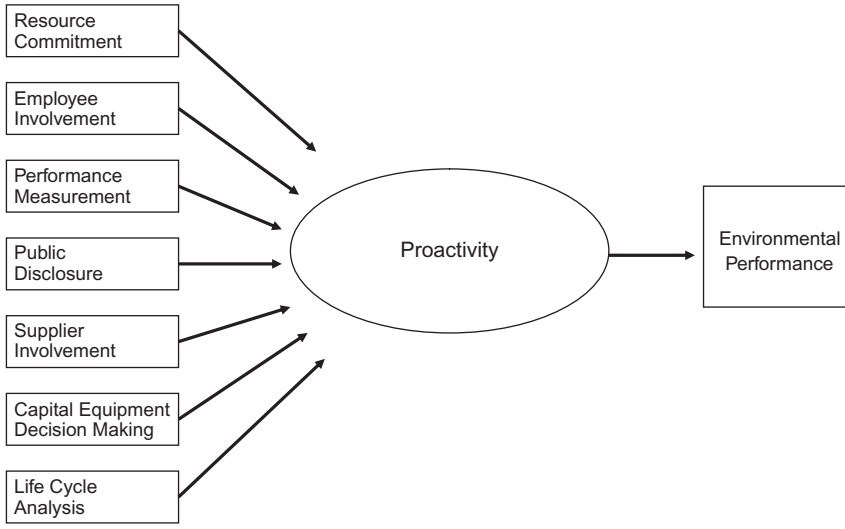

Fig. 1. Conceptual Performance Model.

to allocating resources on an as-needed basis. Firms may be proactive toward environmental management either because the down-side risk of poor performance may be too costly for the organization or because they recognize that superior environmental performance creates firm value (Reinhardt, 1999). Managers are therefore more likely to commit scarce resources to initiatives that are important to the well-being of the firm.

2. *Employee involvement*. Just as total quality management has been decentralized throughout organizations (“quality is everyone’s job”), proactive environmental management requires employee responsibility and accountability. A structure of decentralized control enables personnel involvement (Birnberg, 1998) and moves decision making downward in the organization to where the information exists (Govindarajan, 1988). Successful implementation of a pollution prevention strategy requires extensive employee involvement, as employees are more familiar with a company’s products and processes (Hart, 1995). Environmental management decentralization is carried out through managerial actions such as employee training, performance reward systems, and through integrating environmental accountability throughout functional areas of the firm (Dasgupta, Hettige, & Wheeler, 2000).
3. *Performance measurement*. Performance measures steer performance by acting as an *ex ante* signal to employees about what outcomes are desired

by the company and also by providing feedback to employees and managers about actual performance, allowing them to take corrective actions when the performance indicators show a discrepancy between actual and desired performance. Performance is better controlled by choosing performance measures that link to strategic objectives, that measure the results of processes that the company is trying to manage, and that drive future value for the organization (Ittner & Larcker, 1998; Kaplan & Norton, 1996, 2000). Companies that proactively manage environmental performance are therefore more likely to develop key environmental performance indicators.

4. *Public disclosure*. External reporting of performance is a key component of the proactive, accountable organization (Epstein & Birchard, 1999; Buysse & Verbeke, 2002). Disclosure of environmental performance has grown dramatically in recent years, due in part to stakeholder pressure for increased transparency and accountability. Research has shown a positive association between quantifiable disclosures of environmental information and environmental performance (Al-Tuwaijri, Christensen, & Hughes, 2001) as well as between environmental disclosures and stock market reaction after an environmental disaster occurred (Blacconiere & Patten, 1994).
5. *Supplier focus*. Companies that are proactive toward environmental management will actively work with their suppliers to better manage environmental performance (Walton, Handfield, & Melnyk, 1998). Recently, Ford and GM announced a requirement for its supplier companies to achieve ISO 14001 environmental management certification as a condition of selling to Ford and GM, and many other companies have adopted similar practices. More closely integrated supplier relationships improve environmental performance through the sharing of process and product innovations (Florida, 1996; Geffen & Rothenberg, 2000). Purchasing companies are also applying supply chain pressure to mitigate risks with supply chain partners, including the risks of supply chain interruption if a poor performer is shut down by regulators and the reputational risk of being associated with an under-performing company.
6. *Capital equipment decision making*. Firms pursue environmental performance improvements through adopting technological innovations (Florida, 1996; Christmann, 2000; Russo & Fouts, 1997). A proactive strategy focuses on eliminating the source of potential problems rather than addressing problems after they have occurred. Companies that are proactive toward environmental management are therefore more likely to

include environmental performance decision criteria in capital equipment decision making (Klassen & Whybark, 1999b).

7. *Life cycle analysis*. Companies use life cycle analysis to identify and manage the ecological impacts and costs of inputs, throughputs and outputs during the entire life cycle of the product. Life cycle analyses and the changes in products and processes that result from these evaluations help to improve product quality, lower costs, and improve competitive advantage (Shrivastava, 1995). A product stewardship approach also benefits companies by identifying product redesigns to reduce liability, by helping to develop new products with lower life-cycle costs, and by identifying up-front environmentally hazardous products and processes (Hart, 1995).

2.2. Environmental Proactivity and Performance

Management control research focuses on the alignment between strategy, management control, and performance outcomes (Dent, 1990; Daniel & Reitsperger, 1991), and effectiveness of management actions and decision making to influence both operational and financial performance (Simons, 1987, 1990, 1994). Ittner and Larcker (1997) argue that the management control system of an organization should complement the organizational strategy and facilitate the effective implementation of strategy by supporting the development and communication of strategy, acting as tactics to carry out these strategies and helping to act as controls to monitor the success of the implementation. Firms that identify and use management control systems to effectively implement strategies are essentially finding ways to leverage or deploy the assets of a firm in a manner that achieves corporate goals (Simons, 1990, 1994; Dent, 1990).

Companies that are proactive toward environmental management should achieve performance outcomes from those proactive actions. As described earlier, environmental proactivity involves many management actions that signal the importance of environmental performance to the organization. These signals include formally committing resources to environmental management, training employees in environment performance processes and expectations, using performance measures to signal key initiatives, choosing suppliers based on their environmental management systems, buying equipment to improve environmental outcomes, and performing life cycle analyses of processes and products. We expect that firms that have implemented a more comprehensive set of proactive environmental actions will report better

environmental performance than firms that have implemented fewer proactive actions. Our hypothesis tests the relationship between proactive environmental management and environmental performance:

H1. Environmental performance is a function of environmental proactivity.

3. METHODS

The data used for this study come from a questionnaire developed and distributed by Judge and Douglas (1998) to a sample of 725 environmental executives working at U.S.-based firms, randomly chosen from listings in the 1992 *World Environmental Directory*.[1] As these firms had appointed environmental managers and were included in the *World Environmental Directory*, they have recognized the need for environmental management within their organizations (Henriques & Sadorsky, 1995). Judge and Douglas received 217 responses (30% response rate) to the mail survey. Subsequently, they performed tests for nonresponse bias using data from 49 nonrespondents, concluding that nonresponse bias based on multiple measures of size and profitability were nonsignificant. The Judge and Douglas study evaluated the antecedents and effects of strategic planning processes using data from 196 respondents (dropping those managers who did not work in corporate or divisional offices where strategic planning was expected to take place). In this study, we evaluated the managerial actions that are a function of proactivity; therefore, we constructed measures from the data that had not been tested in the Judge and Douglas study.

Of the 217 original responses, we omitted 38 companies that did not respond to each of the variables of interest for our study, resulting in a sample size of 179 companies. The average company size was 17,933 employees (median of 6,000); the companies represented a cross-section of industries including chemical (38%), durable goods (17%), consumer goods (13%), utilities (22%), and other (9%). The 16 firms in the "other industries" category included airlines and other service industries, and firms that could not be identified by industry.

3.1. Measures

The Fig. 1 conceptual model was constructed using both manifest and latent variables. Our latent variables were constructed following recent

recommendations in the psychometric (Bagozzi & Heatherton, 1994) and organizational methods (Bagozzi & Edwards, 1998) literatures to utilize a partially disaggregated model wherein indicators are formed as averages of items found to load on a factor. The partially disaggregated model helps to smooth out measurement error, reduce the number of parameters to be estimated, and maintain reasonable ratios of cases to parameters. Before evaluating the model shown in Fig. 1, exploratory factor analyses for the latent variables at the item level were conducted to confirm that items loaded highly on hypothesized factors (loadings $>.40$) and did not load highly on all other factors (loadings $<.25$). The overall model was controlled for company size as represented by the logarithm of the number of employees, which was a covariate in the model.

A 5-point Likert scale was used for all responses. Unless otherwise identified, the response choices were *strongly disagree, disagree, neither agree nor disagree, agree,* and *strongly agree*. The measures used in this study were constructed as follows:

- *Resource commitment* (one item). "Which phrase best captures the resource commitment of this company to the environmental department?" Response scale: minimal resource commitment; budgets for problems as they occur; consistent but minimal funding; generally adequate funding; open-ended funding.
- *Employee involvement* (one item). "This company educates, trains, and motivates its employees to conduct their activities in an environmentally responsible manner."
- *Performance measurement* (one item). "This company measures environmental performance carefully and uses these assessments to help make managerial decisions."
- *External disclosure* (one item). "This company is generally willing to provide information to the public regarding its environmental performance."
- *Supplier focus* (three items; $\alpha = 0.977$). "This company chooses suppliers on the basis of the suppliers' environmental performance and/or on the existence of an effective environmental management program"; "This company actively works with suppliers to help them reduce their own levels of environmental emissions and impacts"; "This company actively works with suppliers to help the supplier produce products which help this company's ability to reduce environmental emissions and impacts."
- *Capital equipment decision making* (two items; $\alpha = 0.993$). "Capital equipment in this company is sometimes replaced primarily because the

older equipment is not designed to aid in the reduction of environmental emissions and impacts''; ''When purchasing new capital equipment, the environmental impact of alternative designs is a primary consideration in choosing the equipment.''

- *Life cycle analysis* (two items; $\alpha = 0.978$). ''This company is moving to a ''cradle to grave'' philosophy on its products, whereby the company is taking more responsibility for their ultimate disposal''; ''This company conducts or supports research on the environmental impacts of the entire life cycle of our products.''
- *Proactivity* (six items; $\alpha = 0.958$). ''This company assesses environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site''; ''When designing new production processes, every effort is made to insure that these processes result in minimal environmental emissions and impacts''; This company chooses alternate material inputs based upon those inputs' potential for minimizing waste or pollution within this company's own processes''; ''Consideration of environmental issues in the design of production processes often yields significant efficiencies and cost savings for this company''; ''This company's products are specifically designed to minimize their environmental impacts''; ''The purpose of our environmental audits is to look for innovative means of reducing waste and preventing emissions.''
- *Environmental performance* (three items; $\alpha = 0.983$). ''Relative to other organizations in your industry, rate your overall performance on each objective: Complying with environmental regulations; Limiting environmental performance beyond compliance; Preventing and mitigating environmental crises.'' Response scale: much worse, worse, average, better, much better.
- *Size*. The logarithm of number of employees; used as a control variable in the model.

Table 1 reports the variable means and standard deviations for the entire sample and by industrial classification. Table 2 presents the correlation matrix for the variables used in the study.

3.2. Analytical Procedures

To estimate parameters and test hypotheses, we used the LISREL8 program to evaluate the covariance matrix of the data (Table 2) (Jöreskog & Sörbom,

Table 1. Description of Variables for Entire Sample and by Industry Classification (Means and *Standard Deviations*).

	Variable Properties		Response Range	Full Sample	By Industry				
	Number of items	α			Chemical	Industrial products	Consumer products	Utilities	Other
Number of firms				179	69	31	24	40	16
Size (number of employees)			23–430 k	17,933	16,213	13,024	16,117	6,947	64,940
Resource commitment	1	*N.A.*	1–5[a]	3.81	3.76	4.03	3.83	3.80	3.56
				0.76	*0.90*	*0.75*	*0.48*	*0.61*	*0.73*
Employee involvement	1	*N.A.*	1–5[b]	3.92	3.91	3.81	4.04	3.93	4.00
				0.72	*0.79*	*0.70*	*0.75*	*0.62*	*0.73*
Performance measurement	1	*N.A.*	1–5[b]	3.60	3.56	3.58	3.83	3.60	3.44
				0.94	*1.03*	*1.03*	*0.92*	*0.74*	*0.89*
Public disclosure	1	*N.A.*	1–5[b]	3.95	3.99	3.84	4.04	3.90	4.00
				0.83	*0.95*	*0.69*	*0.86*	*0.63*	*0.97*
Supplier focus	3	*0.977*	1–5[b]	2.93	2.85	3.00	2.97	3.98	3.17
				0.85	*0.85*	*0.95*	*0.80*	*0.87*	*0.76*
Capital equipment decision making	2	*0.993*	1–5[b]	3.63	3.71	3.53	3.69	3.51	3.72
				0.86	*0.88*	*0.87*	*0.91*	*0.83*	*0.75*
Life cycle analysis	2	*0.978*	1–5[b]	3.51	3.40	3.58	3.56	3.65	3.31
				0.91	*0.98*	*0.79*	*1.06*	*0.76*	*0.89*
Proactivity	6	*0.958*	1–5[b]	3.66	3.64	3.68	3.89	3.53	3.69
				0.58	*0.64*	*0.56*	*0.53*	*0.54*	*0.43*
Environmental performance	3	*0.983*	1–5[c]	3.84	3.95	3.89	3.75	3.68	3.85
				0.63	*0.59*	*0.60*	*0.72*	*0.61*	*0.68*

Response scales:
[a]Minimal resource commitment (1) to open-ended funding (5).
[b]Strongly disagree (1) to strongly agree (5).
[c]Much worse (1) to much better (5).

Table 2. Correlation Matrix.

		1	2	3	4	5	6	7	8	9	10
1	Proactivity	1									
2	Environmental performance	0.49	1								
3	Disclosure	0.43	0.21	1							
4	Life cycle analysis	0.62	0.30	0.32	1						
5	Supplier focus	0.59	0.29	0.32	0.45	1					
6	Measurement	0.67	0.33	0.32	0.46	0.38	1				
7	Capital equipment decisions	0.80	0.39	0.39	0.42	0.32	0.51	1			
8	Employee involvement	0.67	0.32	0.35	0.36	0.35	0.42	0.45	1		
9	Resource commitment	0.50	0.25	0.16	0.24	0.15	0.40	0.34	0.22	1	
10	Size	0.13	0.07	–0.05	0.01	0.01	0.09	0.13	0.02	0.04	1

1996). The goodness-of-fit of the model was evaluated with the chi-square test, the Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Squared Residual (SRMR), the Non-Normed Fit Index (NNFI) (also known as the Tucker and Lewis Index), and the Comparative Fit Index (CFI). The chi-square test assesses the magnitude of the discrepancy between the observed variance–covariance matrix of observations and the implied or fitted variance–covariance matrix. The normal standard of fit based on the chi-square test calls for a nonsignificant value at the 0.05 level of significance. However, given the sensitivity of the chi-square test to sample size, other indices are used to better assess goodness-of-fit in this study because of the relatively large sample size employed. The RMSEA and the SRMR are absolute fit indices and assess how well a hypothesized model reproduces the sample data. The NNFI and the CFI are incremental fit indices and indicate the proportionate improvement in fit achieved by a hypothesized model over a more restricted, nested baseline model. For discussions of these indices, see Bentler (1990), Marsh, Balla, and Hau (1996), Jöreskog and Sörbom (1996), and Browne and Cudeck (1992). The most recent and definitive guidelines have been proposed by Hu and Bentler (1999) who recommend that the RMSEA be less than or equal to 0.06, the SRMR be less than or equal to 0.08, and the NNFI and the CFI be greater than or equal to 0.95. We also employ chi-square difference tests to assess the possibility that the identified managerial control actions had a direct association with environmental performance rather than working through environmental performance as a function of environmental proactivity.

4. RESULTS

The results of the statistical analyses are presented in Table 3. The test of the conceptual model (Panel A) demonstrates that the model fit is very good, as shown by the following goodness of fit measures: χ^2 (d.f. 35, $n = 179$) = 59.52, $p \cong 0.00$; RMSEA = 0.06; SRMR = 0.049; NNFI = 0.96; and CFI = 0.98.

Table 3. Analytical Results.

Panel A: Conceptual Model

Model	χ^2 (df 35)	*p*	RMSEA	SRMR	NNFI	CFI
Conceptual	59.52	0.006	0.06	0.05	0.96	0.98

Panel B: Operationalization of Proactivity and Hypothesis Test

	Unstandardized coefficient	Standard error	*t*-value
Proactivity is a function of resource commitment	0.12	0.04	3.26**
Proactivity is a function of employee involvement	0.15	0.04	3.68**
Proactivity is a function of performance measurement	0.05	0.03	1.59
Proactivity is a function of public disclosure	0.01	0.03	0.21
Proactivity is a function of supplier involvement	0.14	0.03	4.08**
Proactivity is a function of capital equipment decision making	0.24	0.04	6.41**
Proactivity is a function of life cycle analysis	0.08	0.03	2.30*
H1: Environmental performance is a function of environmental proactivity	0.53	0.12	4.46**

Panel C: Analyses of Nonhypothesized Paths

Alternative path	χ^2 (df 35)	χ^2 difference (df = 1)	*p*-value
Resource commitment → environmental performance	59.52	0.00	N.S.
Employee involvement → environmental performance	57.6	1.92	N.S.
Capital equipment → environmental performance	58.19	1.33	N.S.
Performance measurement → environmental performance	59.32	0.20	N.S.
Supplier involvement → environmental performance	59.52	0.00	N.S.
Life cycle analysis → environmental performance	59.33	0.19	N.S.
Public disclosure → environmental performance	59.44	0.08	N.S.

*Significant at .05.
**Significant at .001.

We first tested the association between seven specific managerial actions and environmental proactivity. As shown in Table 3, Panel B, the data analysis provided strong support for five of the seven managerial actions: resource commitment ($\gamma = 0.012$, s.e. $= 0.040$, $t = 3.26$), capital equipment decision making ($\gamma = 0.240$, s.e. $= 0.04$, $t = 6.41$), supplier focus ($\gamma = 0.14$, s.e. $= 0.03$, $t = 4.08$), employee involvement ($\gamma = 0.15$, s.e. $= 0.04$, $t = 3.68$), and life cycle analysis ($\gamma = 0.08$, s.e. $= 0.03$, $t = 2.30$). No support was found for the association of disclosure with proactivity ($\gamma = 0.010$, s.e. $= 0.03$, $t = .021$) or for performance measurement ($\gamma = 0.050$, s.e. $= 0.03$, $t = 1.59$). Overall, the explained variance in environmental proactivity was considerable ($R^2 = 0.91$). We then tested the relationship between environmental proactivity and environmental performance. The path from proactivity to environmental performance was positive and significant ($\gamma = 0.53$, s.e. $= 0.12$, $t = 4.46$), and the model explained 23% of the variance in environmental performance (Fig. 2).

Table 3, Panel C, reports the results of the chi-square difference tests that examine the potential direct paths between each of the management control variables and environmental performance. That is, do these actions independently and directly impact environmental performance, or are they mediated by proactivity, which directly impacts environmental performance? As shown by the analysis, none of these alternative paths was significant in this model.

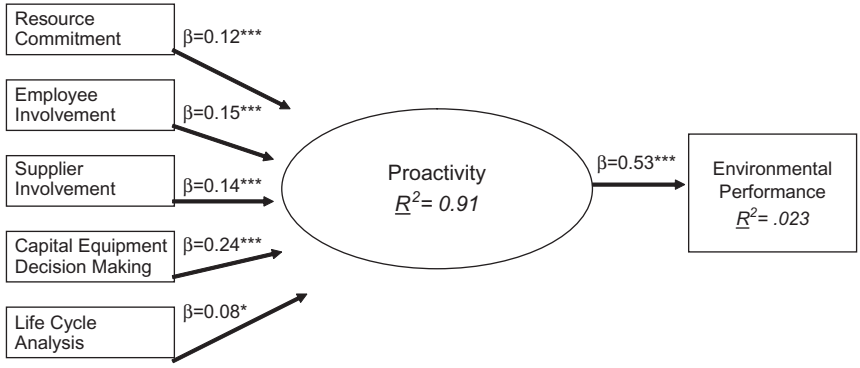

Fig. 2. Actual Performance Model (Model Controlled for Size of Firm, Using the Logarithm of the Number of Employees As a Covariate).

5. DISCUSSION AND CONCLUSION

Companies are faced with a multitude of competing priorities for management attention and funding. On a daily basis, managers have to make crucial decisions about where and how to allocate human, technical, and monetary resources in a company. Pressures from top management, shareholders, and the investment community demand that these day-to-day managerial decisions and the implementation of these decisions add value to the company. Conceptually, management control of an organization requires managers to link decision making to strategic objectives and to link operational and financial outcomes to the implementation of these decisions. However, it is often difficult to determine what management decision processes and actions are most effective in translating strategic objectives into achieved performance. A number of prominent academic researchers (Simons, 1994; Kaplan & Norton, 1996) have proposed frameworks or models that describe the implementation of strategy in organizations. Previous studies focusing on the implementation of quality and new product development strategies have reported a performance effect related to management control (Davila, 2000; Daniel & Reitsperger, 1991), and our study affirms that this performance effect is also related to implementing an environmental strategy. This study therefore contributes to the management control literature by linking the implementation of environmental strategy to performance outcomes through specific managerial actions and decisions.

Our analysis of data from a cross-section of industries reports results that are consistent with the theoretical frameworks of strategy implementation. Each of the companies in our sample employs an environmental manager to implement the environmental strategy of the organization and to manage the environmental performance outcomes. In this multi-industry sample of companies, the firms that reported the best performance in complying with regulations, exceeding regulatory standards, and preventing environmental problems were those firms that were most successful at proactively integrating environmental management decisions into their product and process design decisions in order to minimize harmful environmental impacts. The firms reporting lower levels of environmental performance were those that were less proactive toward environmental management.

The environmental performance variable was based on the environmental managers' subjective responses to three environmental performance questions, which may introduce bias into the measure. Although having an

objective and verifiable measure of environmental performance would be more desirable, two conditions make this subjective measure acceptable for this study. First, the environmental performance variable was created as a factor of three survey questions, giving us stronger reliability of this measure. Second, our study is focused on understanding whether the use of management actions and processes reported by the firms that also report that they have relatively better environmental performance outcomes differ from the use of management actions and processes reported by the firms that say they have relatively weaker environmental performance outcomes. Although the use of survey data introduces potential common method bias into the measures, when possible we used multiple response items to operationalize variables in the model, strengthening confidence in our results.

Another limitation in the chapter is that we did not have a verifiable measure of firm value or any other financial measures that we could link to the implementation of a proactive environmental management strategy. It is also arguable that a cross-sectional set of data is not adequate to demonstrate relationships between actions and outcomes and that time-series data is needed to effectively examine the relationships between managerial actions and firm outcomes. Although our cross-sectional view of a firm's actions and outcomes is clearly not as rich of a dataset as one that includes time-series data, the survey questions asked were designed generally to be environmental management process questions that asked about the actions generally taken over a period of time.

This chapter contributes to the understanding of environmental management practices by providing a more precise specification of what it means for a firm to be environmentally proactive, based on the management control practices reported by 179 environmental management managers. Although some of the actions identified earlier are somewhat broad in nature (e.g., committing adequate resources), others are specific enough to help managers focus on where to deploy their resources to achieve the strongest outcomes. By identifying discrete managerial actions that are associated with environmental proactivity, which is then positively associated with environmental performance, we are giving managers a working model of how to operationalize their environmental management strategies into actions that have been shown to have positive results in controlling environmental performance outcomes.

The data also provide insights into how firms implement proactive environmental strategies. In relative order of importance, the management

control processes and actions that were consistent with an environmentally proactive firm are the following:

- replacing capital equipment that does not adequately conform to environmental standards and making environmental standards a decision factor in the purchase of new equipment,
- choosing suppliers in part on the suppliers' environmental performance records and actively working with suppliers to improve both the supplier's and the firm's environmental outcomes,
- educating, training, and involving employees in environmental management initiatives,
- committing adequate resources to environmental management initiatives, and
- researching environmental impacts of processes and products, and taking "life cycle" responsibility for products.

Operationally, it makes sense that the management control actions with the strongest associations with proactivity relate to processes that are typically conducted early in the production planning process – capital equipment decisions and supplier involvement. In their planning processes, firms must initially make decisions about their fixed assets and equipment needed, and then they must ensure the relevant supply of materials, goods, and expertise to achieve their goals. Some of the expertise is external (suppliers), whereas other expertise is internal (employees). These three managerial processes – capital equipment decisions, supplier involvement, and employee involvement – were the three processes that had the strongest relationships with proactivity.

Although performance measurement variable correlated strongly with proactivity, the relationship was not significant. Strategic performance measures are used to communicate strategic initiatives and to focus attention on strategic outcomes that are important to the organization. In this regard, we would expect that performance measures would be significantly associated with proactivity. The lack of significance of this variable may be caused by measurement error. Only one question was used to capture the performance measurement variable, and this question was worded retrospectively: "This company measures environmental performance carefully and uses these assessments to help make managerial decisions." Perhaps if the performance measurement variable had been measured from the perspective of using performance measures to *ex ante* signal environmental strategy and expectations, the link to proactivity would have been established.

The public disclosure variable was also not significantly associated with proactivity. This may be because public disclosure takes place after a process is complete and the results have been verified or audited. Therefore, although public disclosure is part of the management control system of the firm, it takes place at the end of a process, rather than in the planning stages. Also, the design of the disclosure variable may have been insufficient to accurately evaluate the relationship between public disclosure and proactivity. Only one disclosure question was asked of the respondents, and there was no data available to measure the extent of public disclosures. Although some firms may have had environmental reports that disclosed multiple measures of environmental performance, others may have only disclosed legal and regulatory outcomes as needed. More research would be needed to further investigate how public disclosure relates to proactivity.

Our data sample included 179 companies representing a cross-section of industries. An extension of our research findings would be an analysis of between-industry differences. We were unable to conduct this analysis using structural equations modeling, as the subsamples of firms within each industry group were not large enough to support the number of variables and parameters in the model. However, we conducted a multiple analysis of variance test to determine whether the mean values of each of the variables differed significantly by industry. We found no significant interindustry differences between the variables.

Another potential extension of our research is to examine the influence of company profitability on how companies implement and manage their environmental management strategies. Some would suggest that more profitable firms are better equipped to commit financial and managerial resources to controlling environmental outcomes. But, others suggest that the more profitable firms are able to achieve higher levels of profitability because they make good management decisions that lead to firm value. Therefore, the argument is that investing in environmental management practices leads to firm value. The dilemma of determining cause and effect between profitability and management actions is beyond the scope of this chapter, as it would require a more complete set of data, such as longitudinal or time-series data, than we have available for these firms. However, answering this question would be an important contribution to the environmental management literature.

The purpose of this study was to examine managerial control processes as they relate to the implementation of an environmental management strategy and to add definition to the discussion of what it means for a firm to be environmentally proactive. By demonstrating that proactivity is a function

of five discrete management control actions and that environmental performance is a function of proactivity, our study adds to the body of knowledge about the influence of management control systems and structures on performance.

NOTE

1. Judge and Douglas shared their response data with us.

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GLOBAL WARMING AND CORPORATE DISCLOSURES: A COMPARATIVE ANALYSIS OF COMPANIES FROM THE EUROPEAN UNION, JAPAN AND CANADA

Martin Freedman and Bikki Jaggi

ABSTRACT

This chapter evaluates whether disclosures on global warming by companies from the European Union are more extensive than disclosures by Japanese and Canadian firms. The study is based on disclosures made on websites, annual reports, social, environmental and sustainability reports and on a questionnaire developed by the Carbon Disclosure Project *by 282 of the largest firms from these countries. Content analysis is utilized to asses their disclosures. The results indicate that the EU firms make significantly less global warming disclosures than firms from Japan or Canada. We also find no relation between the changes in carbon emissions and global warming disclosures indicating that these disclosures do not truly reflect emission performance. These findings suggest that the EU requirements of reducing GHG pollution have not improved GHG*

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 129–160

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004009

disclosures. Regulatory disclosure requirements may be the answer to improve disclosures.

INTRODUCTION

The Kyoto Protocol, which went into effect in February 2005, provided impetus to reduce greenhouse gas (GHG) emissions to control global warming and make the global environment cleaner. Almost all of the industrialized nations except the United States have ratified this agreement. In order to achieve the objective of reducing GHG, the European Union (EU), Canada and Japan agreed to specific limits on their GHG emissions. The EU countries have exhibited special concern about global warming and environmental pollution by initiating a plan in 2005 to reduce pollution emissions, that is even before the start of the Protocol in 2008. Additionally, the EU developed a carbon allowance system to control overall carbon emissions. Though Japan and Canada have not yet devised any specific scheme to limit GHG emissions on an overall basis, they are encouraging companies in their respective countries to reduce emissions.

Reduction in GHG pollution emissions demands that this information is conveyed to investors so that they can make informed judgement on the companies' GHG performance. Proper dissemination of information on the companies' efforts to reduce emissions is critical to keep the stakeholders informed about the companies' strategies and actions on GHG issues. Disclosure of detailed information on GHG emissions will enable the stakeholders to evaluate pollution performance and take appropriate actions within the market control framework to discipline managers if they are not performing their job well. Proper evaluation of GHG performance by the stakeholders, however, depends on the assumption that GHG disclosures truly reflect GHG performance. If disclosures do not truly reflect GHG performance, the stakeholders' evaluation will be based on incomplete and biased information.

Given the importance of GHG disclosures in evaluating company GHG performance to control emissions across countries, we conduct comparative analyses of GHG disclosures by important industrialized countries ratifying the Protocol. We base our study on the EU countries, Canada and Japan. Because the United States did not approve the protocol it is not included in the analyses. Our focus is on the following three research questions in this study. First, we evaluate whether GHG disclosures by EU countries is

higher compared to Canada and Japan. We expect higher disclosures by the EU countries because these countries started the GHG control process much earlier than Canada and Japan. Second, we evaluate whether GHG disclosures differ across EU countries. We argue that GHG disclosures will be influenced by the environmental factors in which the firms operate and by the regulatory experience of companies within the EU countries before the Protocol. Because cultural environments differ within EU countries and prior regulatory environments also differ across EU countries, we expect differences in GHG disclosures within EU countries. Third, we evaluate whether GHG disclosures reflect GHG performance by firms. Though GHG disclosures are expected to reflect GHG performances by companies in the competitive business environments, evidence provided in the environmental accounting literature indicates that pollution disclosures do not truly reflect pollution performance. We test the association between GHG disclosures and GHG performance across different countries covered in this study.

We base our study on the largest investor-owned companies from industries that are affected by the Protocol in sample countries because financial markets generally focus on these companies and these companies are also under greater scrutiny of investors and other stakeholders, which should make managers of these companies more sensitive to GHG disclosures. Additionally, being large companies they are likely to be more concerned with their GHG performance and are also likely to be under scrutiny by regulators. The study is based on 148 companies from the EU countries (including 22 French, 26 German and 32 the UK), 106 Japanese and 28 Canadian companies. We conduct univariate as well as multivariate tests on the pollution disclosures by companies from these countries.

Our results show that GHG disclosures by the Candian and Japanese companies are higher compared to the companies from the EU countries. Thus, our findings are inconsistent with our expectation that EU countries would have higher GHG disclosures. One plausible explanation is that the Canadian and Japanese firms have been more concerned about their GHG disclosures after ratifying the Protocol, whereas EU countries, even though they started the process earlier, did not keep up with Canada and Japan to make reliable GHG disclosures. Another explanation for this difference may be that GHG disclosures by the Candian and Japanese companies may not truly reflect GHG performance. Additionally, the results show that GHG disclosures do not differ across EU countries. This result suggests that GHG disclosures are not influenced by the cultural environment and regulatory experience of individual EU countries. With regard to the association

between GHG performance and disclosures, we find that there is no significant association. This finding suggests that, in general, GHG disclosures have no relationship with actual GHG performance by companies or their efforts to limit GHG emissions. We also find that larger companies are associated with comparatively higher GHG disclosures.

The findings of this study contribute to our better understanding of GHG disclosures by EU, Japanese and Canadian companies. Overall, the findings show that global warming has made some companies aware of their responsibilities in controlling GHG emissions and that some of these companies are also making detailed disclosures about their performance. The findings also show that GHG disclosures do not truly reflect GHG performance. Though EU has expressed great concern for global warming and the Kyoto Protocol, GHG disclosures by EU companies is not consistent with this enhanced concern. Apparently, the EU companies are either lacking in GHG disclosures to reflect their GHG performance or the expectation of better GHG performance by EU companies is erroneous. These findings thus suggest that appropriate regulations may be needed to make companies more serious about their GHG disclosures and to ensure that there is a proper association between GHG disclosures and GHG performance. True reflection of pollution performance by pollution disclosures is important for stakeholders for their investment decisions.

The remainder of this chapter is organized as follows: In the second section, we present the background for this study. The third section contains discussion on the hypotheses and fourth discusses research design, including data collection and research methodology. The results are discussed in the fifth section and conclusion is presented in the sixth section.

BACKGROUND

Kyoto Protocol and Pollution Emissions

The first commitment period of the Kyoto Protocol commenced in 2008. Thirty-five industrialized nations, including the European Union, now have only four years starting with 2009 to achieve an average reduction of GHG emissions of 5 per cent compared to the 1990 base line year. In the case of Japan, where total emissions have been rising, a reduction of 14.1 per cent over 2006 emissions will be needed to achieve the 6 per cent reduction promised in the Protocol (Masaki, 2007). The EU, however, already had a plan in place for implementing the Kyoto Protocol before the Protocol

going into effect. Moreover, individual EU member states targeted the plants producing the greatest amount of carbon emissions to achieve emission reduction and gave carbon credits to individual firms in their respective countries. The industries which were originally given allocations of carbon credits included companies from chemical and drugs, energy, engineering (i.e. construction), materials (ceramics, cement, glass, lime, steel, paper, mining, other metals, etc.), motor vehicles, oil and gas and utility industry. Airlines, despite being major producers of GHG emissions, were not given an initial allocation. Although property and casualty insurance companies were not given credits, they were considered as companies which might be severely impacted by the climate change (Freedman & Jaggi, 2005).

As of 2006, 10,605 installations have been granted carbon credits (EEA, 2006). Companies can also develop joint implementations or clean carbon development mechanisms to earn carbon credits. To achieve the reduction of 8 per cent below the emissions of the base line year 1990 during the 2008–2012 of the Kyoto Protocol (*Environmental News Service*, 2006), at the country level, the EU created a GHG allowance trading scheme which permitted firms to buy and sell carbon credits.

Each country within the EU-15 (the countries that were members of the EU before 2004) instituted a plan to meet the emission targets. The first phase of their plan began in January 2005 (the Kyoto Protocol went into effect in February 2005) and extended until 31 December, 2007 (*First Environment*, 2007). This phase primarily focused on reduction of carbon emissions. In the second phase, which extends from 2008 through 2012 and also coincides with the first commitment period of the Kyoto Protocol, the focus of emission reduction has been extended to other greenhouse gases (*First Environment*, 2007). The main goal of the second phase is to achieve the EU's promised GHG emission reduction of 8 per cent (*Environmental News Service*, 2006).

The Scandinavian members of the EU (Sweden, Denmark and Finland) implemented a carbon tax scheme in the 1990s (Weir, Birr-Pedersen, Jacobsen, & Klok, 2005). In terms of attempting to limit carbon emissions, companies from these countries have been trying to reduce emissions for a number of years before February 2005 commencement of the Kyoto Protocol.

In addition to the EU countries, Japan and Canada, which also ratified the Kyoto Protocol, agreed to reduce their GHG by 6 per cent compared to the 1990 base line emissions in the first commitment period. Neither of these countries, however, created the carbon trading scheme. If companies from these countries had installations in the EU they were treated as if they were

domestic companies and were required to meet the EU requirements for their plants in the EU countries. In other words, if a Japanese or Canadian company has a plant in an EU country, it will be required to meet the appropriate EU standards, and at the same it will receive carbon allocation if it is in an industry that received carbon allocation in the EU countries.

Although the Canadian government pledged $1 billion for its climate change plan and actually spent $3.7 billion in 2003 (*CBC News*, 2007), the new Conservative government decided to ignore the Protocol (*Reuters News Service*, 2008b). In fact on 23 April 2008, the UN ruled that Canada (and Greece) were in breach of the Protocol for failing to monitor and report GHG emissions (*Reuters News Service*, 2008b). Japan decided to meet the goals of the Protocol by forging voluntary agreements with industry (*Reuters News Service*, 2008a). Although this plan was considered to be a setback for those who wanted mandated standards, the Japanese government claimed that the plan would enable the country to reduce carbon emissions by 37 million tons.

GHG Disclosures and Different Constituent Groups

Companies need to be held accountable for their GHG emissions and their consequences irrespective of whether they have permission to pollute (provided by the allowance or tax system) or not. Though all stakeholders are impacted by strategic policies and pollution performance, the shareholders have special interest in disclosures because this information will have a significant impact on their evaluation of the company performance. Creditors would also like to know the impact of GHG-related activities on company performance.

In addition to investors and creditors, GHG disclosures will have an impact on other constituent groups in different ways. Suppliers would like to know about the changes in the production processes and how these changes will contribute to global warming because GHG performance by the company may affect their relationship. Customers would like to be kept abreast of the product changes and how the company is meeting its global warming commitments because their relations with the company are especially affected by environmental pollution caused by the company. Employees are also impacted by the changes in production, markets and economic consequences of how the company comes to terms with global warming. They will especially be concerned from the perspective of the impact of these changes on their compensation and security in the company.

Finally, the community (which in the case of GHG is the world) would like to know if the company is progressing in meeting its GHG goals to reduce environmental pollution.

Carbon Allowance System

In order to meet the overall Kyoto requirements, EU instituted a carbon allowance and trading system. Some authors have, however, criticized the allowance system because by providing the European companies with allowances, the EU is giving these companies permission to emit a certain level of carbon dioxide each year. According to Lehman (1996), an allowance system is in essence a license to pollute. Furthermore, setting a limitation on GHG emissions under the Protocol has also been criticized on the ground that companies from countries that are not in the EU, but have agreed to reduction in their GHG emissions to a certain level, also have a license to pollute as long as it is less than whatever the percentage their country agreed.

Motivation for Voluntary GHG Disclosures

In order to be accountable for pollution-related policies and actions, companies should make comprehensive pollution-related disclosures. In the absence of any specific requirement for these types of pollution disclosures by companies, pollution disclosures are made voluntarily. Thus, disclosures concerning global warming, in general – including progress in terms of the Kyoto Protocol, GHG emission reductions, etc. – fall under the rubric of voluntary disclosures. There should, however, be some motivation for managers to disclose pollution information voluntarily, even if amounts involved may and may not be material in most of the cases. We provide a brief discussion on different theories which explain why firms would choose to disclose GHG information voluntarily. Clarkson, Li, Richardson, and Vasvari (2008) divide major theories on environmental disclosures into two groups: voluntary disclosure theory and socio-political theories.

According to Clarkson et al. (2008), the term voluntary disclosure theory is based on the belief that the firms that do well in terms of environmental performance would like to convey information to the stakeholders in a way that it is hard to mimic by poor performers (see Verrecchia, 1983; Dye, 1985

for a description of the general theory). They utilize objective environmental performance indicators and evaluate whether the elements of environmental disclosures will have a positive association with environmental performance (Clarkson et al., 2008).

The socio-political theories are comprised of political-economy, stakeholder and legitimacy theories (Clarkson et al., 2008). The political-economy theory was first applied to environmental accounting disclosures by Guthrie and Parker (1990). Under this theory, the accounting reports reflect the ideology of corporate interests and may be construed as representation of the management's perspectives on these issues. The stakeholder theory and legitimacy theories are generally construed as subsets of the political-economy theory.

The stakeholder theory (Clarkson, 1995; Ullmann, 1985; Roberts, 1992), which has been often used in the environmental accounting literature, holds that environmental disclosures are made because they are demanded by the stakeholders. Management meets these demands by providing what they believe the stakeholders want, and they provide pollution related information they expect would satisfy the stakeholders' information needs. Legitimacy theory (Dowling & Pfeffer, 1975; Patten, 2000), as it is interpreted by accounting researchers, posits that firms try to behave in a way that society wants them to behave. By disclosing environmental information, the company makes itself look legitimate in the eyes of public and this relieves public pressure on the company. In fact, the company may be acting in a way that is contrary to what is reported. The major difference in the two theories is that in the stakeholder theory the company responds by providing information that they believe is really what is desired by the stakeholders. However, in the legitimacy theory information is provided by management to make the company look good in the eyes of stakeholders, but this information may not be suitable for making good investment decisions.

Because our study is based on firms from a number of countries, motivation for pollution disclosures may differ across countries and the differences in disclosures may be the function of differences in political, social, economic and cultural environments of these countries. Although some studies concerning environmental disclosures have included these variables in their analyses (see e.g. Buhr & Freedman, 2001; Freedman & Jaggi, 2005), Buhr–Freedman's study is one of the few studies that claim that some of the differences in environmental disclosures are attributable to the cultural differences. In view of the differences in the socio-economic and cultural environments across countries, motivations to disclose information

on GHG emissions and on the Kyoto Protocol may differ across countries, and it may be difficult to test any particular theory in different environments. Even if our focus is on a few selected countries, it would be difficult to attribute pollution disclosures to a particular theory across sample countries. A study by Saudagaran and Biddle (1995), which compared mandated disclosures and other disclosure factors among five countries, found that disclosures differed from most to least in the following sequence of the countries: Canada, the United Kingdom, France, Japan and Germany. There may, however, be some consistency in the comparative international studies concerning environmental disclosures if companies are from the Anglo-American group (which includes Canada and the UK) because they tend to disclose more information than companies from other countries (see Gamble, Hsu, Jackson, & Tollerson, 1996; Fekrat, Inclan, & Petroni, 1996). Findings of still another study indicate that Canadian firms provide the greatest amount of disclosures and Japanese firms provide the least (Fekrat et al., 1996).

Because the impetus for the study is implementation of the Kyoto Protocol, we focus on examining what motivates firms from countries that ratified the Protocol and agreed to GHG emission reductions to disclose their commitments and accomplishments. We, therefore, are not directly testing the validity of any particular theory. Instead, our focus is on examining the extent of disclosures by firms from these countries and the progress made by them in achieving the goals of the Kyoto Protocol and the Carbon Allowance System. Thus, we assume in this study that managers may be motivated by either one of the aforementioned theories or by a combination of different theories.

RESEARCH QUESTIONS AND HYPOTHESES

GHG Disclosures by EU Firms, Japanese and Canadian Firms

The first research question addressed in this study is whether GHG disclosures, which reflect the company's global warming performance, are more extensive in the EU countries compared to Japan and Canada. Assuming that GHG disclosures are a function of GHG emissions and environmental settings in which companies operate, environmental setting is likely to be a significant differentiating factor for such disclosures. It can also be argued that since EU companies began implementing certain aspects of the Protocol in 2005 (and some even sooner), they would have more

experience in global warming disclosures than Japanese or Canadian companies. Furthermore, this earlier implementation of the Protocol might translate into better GHG performance in EU companies, and this better performance shall be reflected in higher GHG disclosures.

The EU countries started to implement an emission reduction policy in January 2005. Therefore, 2005 represents the first year of this new policy. We expect this policy to have some effect on carbon emissions. For those companies that reported emissions for 2004 through 2006, we expect some reduction in emissions by these companies. That is, the companies that report GHG emissions are more likely to have implemented some kind of a plan concerning carbon emission reduction, especially companies from the EU-15. Though implementation of programs is guided by individual countries within EU, accounting regulations are developed by an overall EU body. Given an early start by firms in the EU countries on controlling pollution emissions, we expect the EU companies to have a comparatively higher GHG disclosures compared to the Canadian and Japanese companies.

However, good GHG performance can be expected from Canadian and Japanese companies because the Canadian government made a large investment to reduce GHG measures in 2003 and Japan implemented a voluntary program for reducing GHG emissions. It is, therefore, an empirical question whether GHG disclosures reflecting GHG performance are better in EU countries than Japan and Canada.

We develop the following hypothesis to test whether GHG pollution disclosures by EU companies are higher compared to the Canadian and Japanese companies:

H1. The GHG-related pollution disclosures are higher in the EU countries compared to Japan and Canada.

The second research question relates to GHG disclosures within EU countries. We argue that GHG disclosures by firms from different EU countries are likely to differ because they are likely to be influenced by the cultural environment of that country and their experience with the regulatory requirements before joining the EU. Therefore, we expect GHG disclosures to differ within the EU countries. This is tested on the following hypothesis:

H2. There are differential GHG-related pollution disclosures among companies from different EU countries.

GHG Disclosures and Carbon Emissions

Intuitively, it can be argued that GHG disclosures are influenced by the companies' GHG performance, meaning that GHG disclosures reflect GHG performance. Higher GHG performance will result in comparatively higher GHG disclosures. Empirical evidence on pollution disclosure literature, however, indicates that there is no clear relationship between pollution disclosures and pollution performance (Patten, 2000). It is, therefore, an empirical question whether GHG disclosures reflect GHG performance. We use the change in carbon emissions from 2004 to 2006 to reflect the impact of Kyoto Protocol on pollution disclosures, and test the association between carbon emissions and disclosures on the following hypothesis:

H3. There is a positive association between the change in carbon emissions from 2004 to 2006 and GHG disclosures over that time period.

RESEARCH DESIGN

Sample and Study Period

Every year *Forbes* magazine publishes a list of 2000 largest companies in the world based on a combination of asset size and revenues. Our sample is comprised of all the EU, Japanese and Canadian companies on the 2005 list from the following industries: airlines, capital goods, chemicals, conglomerate, consumer durables, energy, property and casualty insurance, materials, motor vehicles, oil and gas and utilities.

The companies are screened based on whether they have a website and whether that website is either in English or translated into English. We also examine information from the *Carbon Disclosure Project* (CDP) (described in the next section) to see if the company has completed the questionnaire and made the results public. If companies disclose their answers to the questionnaire regardless of the availability of the website, they are included in the sample. Few companies are eliminated because of these requirements. The final sample consists of 282 companies. In Table 1, we provide home country, industry and the source of the data, revenues and disclosure index for the sample companies. As is evident from the table, the sample includes 148 EU companies[1] (including 22 French, 26 German and 32 UK), 106 Japanese and 28 Canadian companies.

Table 1. Sample, Sources of Disclosure and Disclosure Index.

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Austria						
EVN	Utilities	CDP '05	2.80	6	0.6	Y
OMV	Oil and gas	CDP '05	23.83	4	0.4	N
Verbund	Utilities		3.62	3	0.3	N
Voestalpine	Materials	AR '04, '05	8.85	4	0.4	N
Wiener Stadtische	Insurance	AR '05	7.39	1	0.1	N
Belgium						
Solvay	Chemicals		11.81	1	0.1	N
UCB	Drugs		2.75	2	0.2	N
Umicore	Materials	AR '05 SR'05	2.12	6	0.6	Y
Czech Republic						
Cez	Utilities	ER'06	7.09	6	0.6	Y
Denmark						
Alk-Abello	Drugs		0.256	2	0.2	N
H Lundbeck	Drugs	SER '06	1.55	3	0.3	N
Novo Nordisk	Drugs	CDP 2 3 AR '05	6.53	6	0.6	Y
Finland						
Fortum	Utilities	CDP 4 5 AR '06	5.64	8	0.8	Y
Metso	Capital goods	SER '06	6.22	6	0.6	Y
M-real	Materials	AR '06	12.41	4	0.4	N
Neste Oil	Oil and gas	AR '06	15.94	6	0.6	Y
Outokumpu	Materials	AR '04-06	7.73	6	0.6	Y
Rautaruuki	Materials	SR '06	4.62	7	0.7	Y
Stora Enso	Materials	CDP 5 AR '05	18.33	9	.9	Y
UPM-Kymmene	Materials		12.59	6	0.6	Y
France						
Air France	Airline	AR '06, SER '06	26.94	6	0.6	Y
Air Liquid	Chemicals	SD '06	13.75	7	0.7	Y
Alstom	Chemicals		16.85	2	0.2	N
Areva	Energy	CDP SER '05	13.69	7	0.7	Y
Electricite De France	Utilities	CDP AR '05	74.02	4	0.4	N
Eramet	Materials		3.83	4	0.4	N
Gaz De France	Energy	SR '05 '06	34.72	7	0.7	Y
Groupama	Insurance		17.79	0	0	N
Michelin	Motor vehicles		20.58	2	0.2	N
Peugot	Motor vehicles	CDP 3-5	71.08	7	0.7	Y
Renault	Motor vehicles	CDP 5	50.2	8	0.8	Y
Rhodia	Chemicals		6.61	4	0.4	Y
Sanofi-Aventis	Drugs		35.64	3	0.3	N
Schneider Electric	Consumer Dbls	CDP 5	17.24	2	0.2	N

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Scor	Insurance	CDP 5	3.69	3	0.3	N
Suez	Energy	CDP AR '05	55.63	8	0.8	Y
Technip	Oil and gas	CDP 5	8.7	4	0.4	N
Thomson	Consumer Dbls	AR '05	6.64	0	0	N
Total	Oil and gas	CDP ER '05	193.18	7	0.7	Y
Valeo	Consumer Dbls	AR '06	12.67	6	0.6	Y
Vallourec	Materials	CDP 5, AR '06	5.15	8	0.8	Y
Veolia	Utilities	CDP 4 5	33.48	7	0.7	Y
Germany						
Allianz	Insurance	CDP 5	127.02	4	0.4	Y
Altana	Drugs	AR '05	4.86	0	0	N
BASF	Chemicals	CDP 5	66.08	7	0.7	Y
Bayer	Chemicals	CDP 5	36.37	8	0.8	Y
BMW	Motor vehicles	CDP 4, AR '05	51.54	7	0.7	N
Continental	Motor vehicles	AR '06	18.7	3	0.3	N
Daimler/Chrysler	Motor vehicles	CDP 3, SR '06	190.4	4	0.4	N
Degussa	Chemicals		13.71	0	0	N
Deutsche Lufthansa	Airline		24.93	3	0.3	Y
EnBW-Energie Baden	Utilities	CDP 5	17.62	4	0.4	Y
EON	Energy	CDP 5	85.11	3	0.3	N
GEA Group	Capital goods		5.45	0	0	N
Hanover RE	Insurance	SR '05	11.67	0	0	N
Heidelberg	Capital goods		4.5	3	0.3	Y
Lanxness	Chemicals		8.72	0	0	N
Linde	Capital goods		15.62	0	0	N
Man	Motor vehicles		16.39	3	0.3	N
Munich RE	Insurance	CDP 5	22.42	4	0.4	Y
Porsche	Motor vehicles		9.25	2	0.2	N
Robert Bosch	Motor vehicles	ER 03-05	54.87	7	0.7	Y
RWE	Energy	CDP 5	53.44	5	0.5	Y
Salzgitter	Materials	AR '05	10.61	1	0.1	N
Siemans	Consumer Dbls		109.68	6	0.6	Y
Thyssenkrupp	Materials	AR '05	64.96	2	0.2	N
Volkswagen	Motor vehicles	CDP 4 5	131.72	7	0.7	Y
Greece						
Public Power	Utilities	ER '05 AR o5-06	6.01	6	0.6	N
Hungary						
MOL	Oil and gas	AR '05	17.38	4	0.4	N
Ireland						
CRH	Materials	CDP 5	25.53	6	0.6	Y
Ryanair	Airline		2.13	0	0	N

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Italy						
AEM	Utilities		8.09	0	0	N
Alatalia	Airline		5.93	0	0	N
CIR	Capital goods		5.2	0	0	Y
Edison	Utilities	SR '05, ER '03	10.7	4	0.4	N
Enel	Utilities	CDP 5 AR '04	1.49	6	0.6	N
ENI	Oil and gas	CDP 5 ER SR 06	114.72	6	0.6	Y
ERG	Oil and gas	HSE 05 AR 05,04	11.46	7	0.7	Y
Fiat	Motor vehicles	AR Sr '06	65.1	2	0.2	N
Pirelli	Motor vehicles	SR '05	6.88	4	0.4	N
Terna	Utilities		1.39	6	0.6	Y
Luxembourg						
Acelor	Materials	AR '05	51.01	5	0.5	N
Tenaris	Materials	AR '06	7.73	2	0.2	N
The Netherlands						
Akzo Nobel	Chemicals		17.25	0	0	N
DSM	Chemicals		10.49	0	0	N
Gasunie Trade	Energy	AR '05	1.57	2	0.2	N
Mittal Steel	Materials	AR '05	111.25	4	0.4	N
Royal Dutch Shell	Oil and gas	CDP 2-5 SR '06	318.55	5	0.5	Y
Royal Philips	Consumer Dbls	SR '06	33.28	6	0.6	N
Schlumberger	Oil and gas		19.23	3	0.3	N
Poland						
KGH Polska Miedz	Materials	AR '05	7.03	3	0.3	N
Portugal						
EDP	Utilities	CDP SR '05	5.22	7	0.7	N
Spain						
Acerinox	Materials		7.08	3	0.3	N
Cepsa	Oil and gas	SR '06	23.73	6	0.6	N
Corporation Mapfre	Capital goods		9.81	0	0	N
Enagas	Oil and gas	ER '05 AR o5-06	0.98	6	0.6	N
Endesa	Utilities	CDP 2	20.31	6	0.6	N
Gamesa	Capital goods		3.02	0	0	N
Gas Natural	Utilities	CR '05	13	6	0.6	N
Iberdrola	Utilities	CDP 5 Ar 06	14.25	7	0.7	N
Iberia	Airline		6.48	0	0	N
Red Electrica de Espana	Utilities		1.19	1	0.1	N

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Repsol IPF	Oil and gas	CDP 5 AR 06 05	69.18	5	0.5	Y
Union Fenosa	Utilities	ER MR 02-06	7.61	9	0.9	Y
Sweden						
Assa Abloy	Capital goods		4.23	0	0	N
Atlas Copco	Capital goods		6.82	3	0.3	Y
Boliden	Materials	SR '05	4.78	4	0.4	N
Electrolux	Consumer Dbls		14.11	4	0.4	N
Saab	Motor vehicles		2.86	3	0.3	N
Sandvik	Capital goods		9.82	0	0	N
SAS	Airline		5.25	0	0	N
SCA	Materials	CDP 2 ER '05	14.91	6	0.6	Y
Scania	Capital goods		9.61	0	0	N
SKF Group	Capital goods		7.21	3	0.3	Y
Vattenfall	Utilities		19.81	6	0.6	Y
Volvo	Motor vehicles	CDP 3 5 AR '06	33.71	6	0.6	N
The United Kingdom						
Anglo American	Materials	CDP 5	33.03	8	0.8	Y
Antofagasta	Materials	AR '06	4	2	0.2	N
AstraZeneca	Drugs	CDP 5	26	9	0.9	Y
AWG	Utilities		1.58	3	0.3	Y
BAA	Airline		1.98	0	0	N
BG	Oil and gas	CDP 5, CR AR 06	14.14	8	0.8	Y
BP	Oil and gas	CDP 5 ER '06	274.32	7	0.7	Y
British Airways	Airline		15.65	3	0.3	Y
British Energy	Utilities	CDP 5	5.53	4	0.4	Y
Bunzi	Materials		6.4	0	0	N
Centrica	Utilities	CDP 3 ER 06 05	30.41	7	0.7	N
Corus Group	Materials	CDP 4	17.94	8	0.8	Y
GKN	Consumer Dbls		6.7	0	0	N
GlaxoSmithKline	Drugs	CDP 5	42.8	6	0.6	N
International Power	Utilities	CDP 5	6.72	3	0.3	N
Invensys	Capital goods		4.53	1	0.1	N
Johnson Mathay	Materials	CSRR AR '06	11.34	4	0.4	Y
Kazakhmys	Materials		5.05	0	0	N
Kelda	Utilities		1.62	4	0.4	Y
National Grid	Utilities	CDP 3-5	3.72	8	0.8	Y
Prudential	Insurance		32.49	0	0	N
Rexam	Materials	ER '06	6.89	4	0.4	Y
Rio Tinto	Materials	CDP 4 SR '06	25.44	7	0.7	Y
Royal & Sun	Insurance		10.11	1	0.1	N

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Scottish and Southern	Utilities	CDP 5	18.7	8	0.8	Y
Scottish Power	Utilities	CDP 5	12.94	6	0.6	Y
Severn Trent	Utilities		2.73	3	0.3	Y
Shire	Drugs		1.54	0	0	N
Smith Group	Conglomerate		5.7	0	0	N
Tomkins	Conglomerate		5.76	1	0.1	N
United Utilities	Utilities	AR '07	4.28	4	0.4	Y
Willis Group	Utilities		2.42	0	0	N
Japan						
Aioi Insurance	Insurance	CSR '06	7.36	2	0.22	N
All Nippon Airways	Airline		11.77	3	0.33	N
Asahi Kasei	Chemicals	CSR '03-06	13.96	5	0.55	N
Asin Sekei	Consumer Dbls	CSR '03-06	18.24	6	0.67	Y
Astellas Pharma	Drugs	CSR '04-07	8.0	6	0.67	Y
Calsonic Kansei	Consumer Dbls	SER '04-'06	6.52	4	0.44	N
Chubu Electric Power	Utilities	CDP 5 4 ER 06	18.75	6	0.67	Y
Chugoku Electric Power	Utilities	CDP 4 AR '07	9.12	3	0.33	N
Cosmo Oil	Oil and gas	CSR 06 04 AR 06	26.34	4	0.44	Y
Daido Steel	Materials	ER 04 AR 07 05	4.43	4	0.44	N
Daiichi Sankyo	Drugs	CSR 03-06	8.0	6	0.67	N
Daikin Ind	Capital goods	CSR '06	7.84	5	0.56	Y
Danippon Ink & Chemi	Chemicals	AR '04-06	8.74	4	0.44	N
Denso	Consumer Dbls	CDP 4 CSR 02-05	6.45	6	0.67	N
Eisai	Drugs		5.8	6	0.67	Y
Electric Power Development	Utilities		4.85	1	0.11	N
Fanuc	Capital goods	ER 05-06	4	6	0.67	Y
Fuji Electric Holdings	Capital goods		7.7	5	0.56	N
Fuji Fire & Marine	Insurance		2.7	0	0.00	N
Fuji Heavy Industries	Consumer Dbls		12.86	7	0.78	Y
Funai Electric	Consumer Dbls		3.36	3	0.33	N
Furukawa	Capital goods	ER 04-06	9.36	6	0.67	N
Hitachi	Conglomerate	CDP 5 CSR 04-06	88.17	7	0.789	Y
Hokkaido Electric Power	Utilities	CDP 4	5.0	6	0.67	Y

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Hokuriku Electric Power	Utilities	CDP 4 CSR AR 06	5.0	6	0.67	Y
Honda	Motor vehicles	ER 05	94	3	0.33	N
Inpex	Oil and gas		8	0	0.00	N
Ishikawajima-Harima	Capital goods	AR 06	10.26	4	0.44	N
Isuzu Motors	Motor vehicles	CSR 06 AR 07	14.3	7	0.78	Y
Japan Airlines	Airline	CDP 5 CRP 03-05	19.5	7	0.78	Y
JFE Holdings	Materials	CSR 2007	28	6	0.67	N
JSR	Chemicals		3	5	0.56	N
Jtekt	Capital goods	ER 06	8.2	6	0.67	Y
Kaneka	Chemicals	RC 03-06	4.07	4	0.44	N
Kansai Electric Power	Utilities	CDP 4 5 CSR 06	22.33	7	0.78	Y
Kawasaki Heavy Industry	Capital goods	CDP 5 ER 04-06	12.37	7	0.78	Y
Kobe Steel	Materials	CSR 05 06	15.170	2	0.22	N
Komatsu	Capital goods	CDP 5	16.29	6	0.67	Y
Kubota	Capital goods	CDP 5	10	6	0.67	N
Kuraray	Chemicals	CSR 04-06	3	6	0.67	Y
Kyushu Electric Power	Utilities	CDP 5 CSR 06 AR07	12.11	8	0.89	Y
MatsushitaElectric Industry	Utilities	CDP 4 5	7.83	7	0.78	Y
Mazda	Motor vehicles	CSR 05 AR 07	27.93	6	0.67	Y
M ilea Holdings	Insurance	CDP 4 5	30.94	5	0.756	N
Mitsubishi Chemical	Chemicals		19.92	3	0.33	N
Mitsubishi Corp	Conglomerate	CDP 5	43.74	4	0.44	N
Mitsubishi Electric	Consumer Dbls	ER 04-06 AR 06	33.06	6	0.67	N
Mitsubishi Gas	Chemicals		4.15	4	0.44	Y
Mitsubishi Heavy Industry	Capital goods	CDP 5 CSR ER 06	24.66	4	0.44	Y
Mitsubishi Materials	Materials	CSR 04-06	12.48	7	0.78	Y
Mitsubishi Motors	Motor vehicles	CDP 4 CSR 06	18.94	7	0.78	Y
Mitsui & Co	Conglomerate	CDP 5	41.97	6	0.67	N
Mitsui Chemical	Chemicals	CSR 03-06	14.52	5	0.56	Y
Mitsui Engineering	Capital goods	ER 02-06	5.36	6	0.67	Y
Mitsui Mining & Smelting	Materials	ER 06 AR 07	5	0	0.00	N
Mitsui Sumitomo Insurance	Insurance	CDP 5	18	6	0.67	Y
Namco Bandai Holdings	Consumer Dbls	ER 06	4	3	0.33	Y

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Nidec	Capital goods	ER 06	5.42	5	0.56	N
Nintendo	Consumer Dbls		8	0	0.00	N
Nippon Light Metal	Materials	ER 07 AR 05 07	5.92	3	0.33	Y
Nippon Mining	Oil and gas	CSR 06 AR 07	32.78	3	0.33	N
Nippon Oil	Oil and gas	CDP 5	19.46	7	0.78	Y
Nippon Paper Group	Materials	CSR 06	10.11	6	0.67	Y
Nippon Steel	Materials	CDP 4 5 CSR 06	37	8	0.89	Y
Nipponoka Insurance	Insurance	CSR 05 06	8.41	0	0.00	N
Nissan Diesel Motor	Motor vehicles	CSR 06	4.01	4	0.44	N
Nissan Motor	Motor vehicles	CDP 4 5 CSR 07	90.03	6	0.67	Y
Nisshin Steel	Materials	AR 06	5.46	4	0.44	Y
Nissay Dowa General	Insurance		2.38	0	0.00	N
Nitto Denko	Chemicals	CSR 02-06	5.85	7	0.78	Y
NSK	Capital goods	CDP 5 CSR 03-06	6.17	8	0.89	Y
NTN	Materials	CSR 05 06	4.16	5	0.56	Y
Oji Paper	Materials	CDP 4 CSR 06	10.89	6	0.67	Y
Ono Pharma	Drugs	CSR 05 06	1.22	3	0.33	N
Osaka Gas	Utilities	CDP 45 CSR 06	10.1	6	0.67	Y
Pioneer/Japan	Consumer Dbls	CSR 03-06	6.76	7	0.78	Y
Sanyo Electric	Consumer Dbls	CSR 03-06	19.05	5	0.56	N
Sega Sammy Holdings	Consumer Dbls		4.53	0	0.00	N
Seiko Epson	Capital goods	SR 06	12.18	6	0.67	Y
Shihokku Electric Power	Utilities	CDP 4 AR 06	4398	6	0.67	N
Shin-Etsu Chemical	Chemicals	CDP 5 ER 03-06	10.36	7	0.78	Y
Showa Denko	Chemicals	CSR 06	7.86	5	0.56	Y
Showa Shell Sekiyu	Oil and gas	CSR 06 AR 04 06	25.12	3	0.33	Y
SMC	Capital goods		2.61	0	0.00	N
Sompo Japan insurance	Insurance	CDP 4 5 CSR 05	11.74	6	0.67	Y
Sony	Consumer Dbls	CDP 4 5	70	8	0.89	Y
Sumitomo Chemicals	Chemicals	CSR 04-06 ESHR	13.25	7	0.78	Y
Sumitomo Electric	Capital goods	CSR 06	20.2	4	0.44	N
Sumitomo Metal Ind	Materials	CSR 06	13.78	7	0.78	Y

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Sumitomo Metal mining	Materials	CDP 4 CSR AR 06	5.33	4	0.44	Y
Sumitomo Rubber	Consumer Dbls	CSR 04-07	4.59	4	0.44	N
Suzuki Motors	Motor vehicles	CSR 06 AR 07	23.62	4	0.44	N
T & D Holdings	Insurance	CDP 45 CSR 06	21.02	3	0.33	N
Taisho Pharma	Drugs	CSR 06	2.08	4	0.44	Y
Takeda	Drugs	CSR 05 06	11.22	6	0.67	Y
Teijin	Chemicals	CDP 4	8.68	5	0.56	N
Tohuku Electric Power	Utilities	CDP 4 CSR 06	14.13	6	0.67	Y
Tokyo Electric Power	Utilities	CDP 5 CSR AR 06	44.74	5	0.56	N
Tokyo Gas	Utilities	CDP 4 5 CSR 06	11.84	8	0.89	Y
Tokyo Steel	Materials		2.11	0	0.00	N
Tosoh	Chemicals	RC 03-06	5.23	4	0.44	Y
Toyo Seikan Kaisha	Materials		6.37	3	0.33	N
Toyota Industries	Consumer Dbls	CDP 4 5 SER 06	12.95	7	0.78	Y
Toyota Motors	Motor vehicles	CDP 4 5 CSR 07	179.08	8	0.89	Y
Ube Industries	Chemicals	RC 02-04	5.64	5	0.56	Y
Yamaha Motor	Motor vehicles	CSR 07	4.55	4	0.44	N
Canada						
Abitibi Consolidated	Materials	CDP 4 5 CSR 06	4.01	7	0.78	Y
Ace Aviation	Airline	AR 07	3	1	0.11	N
Agrium	Materials	CDP 4 5	4	5	0.56	N
Alcan	Materials	CDP 4 5	23.84	7	0.78	Y
Barrick Gold	Materials	CDP 4 5	6	6	0.67	Y
Cameco	Materials	CDP 4 5	1.62	5	0.56	Y
Candian Natural Resou	Capital goods	CDP 4 5	12	3	0.33	N
Enbridge	Oil and gas	CDP 5	9.39	6	0.67	Y
En Cana	Oil and gas	CDP 5 AR 06	11	6	0.67	Y
Fairfax Financial	Insurance	AR 06	6.8	0	0.00	N
Gold Corp	Materials		2	6	0.67	Y
Husky Energy	Oil and gas	CDP 5 AR 05	13	4	0.44	N
Inco	Materials	AR 06	4.52	6	0.67	N
Ipsco	Materials	AR 06 04	4	2	0.22	N
Magna International	Consumer Dbls	CDP 4 AR 04	24	2	0.22	N
Manulife Financial	Insurance	CDP 3 AR 06	30.16	5	0.56	Y

Table 1. (*Continued*)

Country/Company	Industry	Sources of Disclosure (Web +)	Revenues 2006 $Billion	Disclosure Index	Normalize Disc. Ind.	Provide Carbon Emission 2006 (Y/N)
Nexen	Oil and gas	CDP 4 5	3.47	8	0.89	Y
Nova Chemicals	Chemicals	CDP 4 5 CSR AR 6	6.52	4	0.44	N
Novelis	Materials	AR 06	4.41	2	0.22	N
Penn West Petroleum	Oil and gas		1.77	3	0.33	N
PetroCcanada	Oil and gas	CDP 5	16.68	5	0.56	Y
Potash of Saskatchewan	Chemicals	CDP 5 CSR 06	3.77	6	0.67	Y
Precision Drilling	Oil and gas	AR 06	1.27	1	0.11	N
Sun Life Financial	Insurance		12.89	1	0.11	N
Talisman Energy	Oil and gas	CDP 4 5	6.9	8	0.89	Y
Teck Cominco	Materials	CDP 5	7	3	0.33	N
TransAlta	Oil and gas	CDP 4 5 CSR 06	2.77	5	0.56	Y
Trans Canada	Oil and gas	CDP 5	8	4	0.44	N

Disclosure Data

Data concerning global warming on the companies included in this study are obtained from a number of different sources, which include the CDP (2006), company's website, social reports, annual reports, etc. The CDP (2006) is organized by a non-profit organization that asks the companies impacted by global warming to complete a questionnaire annually (starting in 2001). The questionnaire focuses on how the company is affected by global warming or by the need to reduce its emissions of GHG. The CDP is trying to determine what the company's current situation is and what it plans to do about the problem in the future. In determining the current situation it asks for information about past and current GHG emissions. In terms of the future, it asks about plans to reduce emissions, to develop new products and its future expenditures. We utilize the corporate responses to the questions as a source of disclosure.

Company websites provide another source of corporate disclosures concerning global warming. Available on the websites are usually the annual financial reports, social/environmental/sustainability reports, news, statements about the environment and other information. The websites provide us with other major sources for disclosures. We have not examined information provided to government agencies by the companies.

For example, although Canadian companies are required to make annual disclosures of GHG by plant and this information is publicly available it is difficult to actually determine the corporate emissions. Similarly, all the EU companies are given a carbon allocation by plant and this too is publicly available.

We[2] examine disclosures made in the CDP and the websites for a period from January 2007 through the beginning of March 2008. For the CDP, the latest disclosures available are from 2006 (CDP5). The websites kept updating their disclosures, but the only complete dataset we could obtain include the 2006 data. Although annual reports, social and environmental and sustainability reports for 2007 (some reports dated 2008 were examined) are provided and are examined, the analysis is through 2006. If there is a change in data in the 2007 reports compared to 2006 reports, the latest and therefore (assumed) better data are used.

Disclosure Index

A disclosure index is developed to facilitate the content-analysis of the reports. In the index, we focus on the categories of disclosure since the interest is on the extensiveness of the disclosure (content) as opposed to the raw amount. This method is considered the disclosure-scoring method (see Al-Tuwaijri, Christensen, & Hughes, 2004; Smith & Taffler, 2000) and is either utilized with an equal weighting scheme or using differential weights. Categories are subjectively determined (Cho & Roberts, 2008). This approach has been utilized in numerous earlier environmental accounting studies (e.g. Wiseman, 1982; Patten, 2000).

The other major method of content analysis utilized in these studies has been based on the quantity of disclosure, whether it is in words, sentences or pages (see, e.g. Buhr, 1998; Patten, 1992). We utilize the category approach instead of counting lines or text, etc. because we are just interested in certain facts. Essentially we are attempting to sanitize the disclosure and eliminate the affective component. How persuasive the company's argument is was irrelevant to the study. Additionally, our interest lies in ascertaining whether certain information is provided and whether it is in a correct form (an amount).

In determining the categories for disclosure, we examine the disclosures made in a sample of the CDP (which tended to be much more extensive compared to the websites). Based on the questionnaire and the sample of responses we develop a scheme for categorizing the answers. Unfortunately,

after examining all appropriate CDP disclosures and information available on the websites it becomes quickly evident that many of the disclosure categories are being ignored by the companies. Furthermore, since the basis of the index is to provide some means of comparison between companies from different industries and operating in different countries, an amended approach is developed.

The following categories are utilized for the index:

1. Mention or allude to global warming or the Kyoto Protocol
2. GHG (or carbon) emissions for 2005
3. Prior years' GHG (or carbon) emissions
4. Statement with regard to what causes the company to produce emissions
5. Whether there is an outside firm doing an environmental audit
6. Amount of energy used in 2005
7. Specific plans to reduce GHG emissions
8. Future expenditures for reducing GHG

For EU companies:

9. Stating their carbon allocation for 2005 (or 2006)
10. Whether they need to buy/sell carbon credits

For Non-EU companies:

Anything about obtaining carbon credits

We use an equal weighting scheme, where each category of disclosure is given a weight of one. The maximum score for EU companies is 10, whereas for non-EU companies is 9. In order to conduct comparative analyses of companies across countries, we utilize the percentage of the maximum score (e.g. an EU 6 is scored as 6/10 or .6 and a Canadian 6 is scored as 6/9 or .67).

Although an argument can be made for utilizing differential weights for different categories, it is fairly difficult to determine and defend the weights given to each category. Earlier studies show that there is no significant difference in the results using both differential and equal weights (see, e.g. Freedman & Jaggi, 2005).

Selection of Variables

We utilize two test variables and two control variable to test the hypotheses in this study. In order to test the first hypothesis, we use an indicator

variable for the home country of the company (Country_IND). The first hypothesis is tested by using an indicator variable for an EU company, indicating whether the company belongs to an EU country. The second hypothesis is tested by using an indicator variable for each EU countries to indicate. The third hypothesis is tested by using the percentage change in carbon emissions (CBN) from 2004 to 2006. We also calculate the emission change in tons scaled by revenue in dollars to consider the effect of growth on the emissions ($CBN).

Industry is used as one of the two control variables. The amount of carbon emitted is to a large degree a function of the nature of industry. In each country studied, the mix of industries within the country is going to be a factor in determining the emphasis taken by the country in dealing with GHG emissions. A dummy variable (IND_DUM) for each industry is used, and the following industries are coded: chemicals and drugs, materials, utilities, oil and gas and energy, consumer durables and capital goods and other (motor vehicles and parts, airlines and insurance companies).

Size is the second control variable used in the study because GHG disclosures may be significantly impacted by the company size. Although the sample is from the 2000 largest companies in the world and almost all of these companies in 2006 had at least $ 1 billion in revenues, the relative size is still considered to be important variable in environmental disclosure studies (e.g. Spicer, 1978; Roberts, 1992). We use log 2006 revenues for the size variable.

Statistical Tests and Model

We use the following regression model to test the above hypotheses:

$$\text{GW\_DIS} = \acute{a} + \hat{a}_1(\text{SIZE}) + \sum_{i=1} \delta_i \text{Country\_Ind}_i + \sum_{j=1} \gamma_j \text{Ind\_Dum} + \mathring{a} \quad (1)$$

where GW_DIS is the Disclosure Index for Global warming; SIZE the Log of 2006 revenues; Country_Ind the Home country of firm: EU (France, Germany, UK, Other EU countries); Japan or Canada; Ind_Dum the Industry: chemicals and drugs, utilities, materials, oil and gas and energy and other; á the constant; δ and γ the coefficients and å the residual.

RESULTS

Descriptive Statistics

Descriptive statistics are contained in Table 2.

The mean of the disclosure index of all sample companies is .45 and for the three major groups of countries is as follows: EU = .39, Canada = .48 and Japan = .54. The mean disclosure index for three EU countries is: France = .48, UK = .387 and Germany .332. The index of all companies reporting carbon emission is .64, whereas it is .598 for EU firms, .67 for Japanese companies and .697 for the Canadian companies. These results show that overall disclosure of all EU companies is smaller compared to Canadian and Japanese companies. The same difference also exists for companies disclosing carbon emissions. With regard to revenues, Canadian companies reported the lowest revenues compared to companies from the EU as a whole and to the individual EU countries and Japan. Similarly, revenues are the smallest for carbon emission firms from Canada.

Disclosures by EU, Japanese and Canadian Companies

First, we compare GHG disclosures by companies across the EU, Japan and Canada by conducting pair-wise *t*-tests. A comparative analysis of EU companies with Japanese companies indicate that disclosures by EU companies is significantly lower compared to the Japanese companies ($t = 4.54$, prob. $< .0001$) and also compared to the Canadian companies ($t = 1.80$, prob. .04). The difference in the means of disclosures by the Japanese and Canadian companies is insignificant. The *t*-test results thus indicate that despite EU's head start in terms of the Protocol, the Japanese and Canadian companies made more extensive disclosures compared to the EU companies.

Next, we conduct regression analysis on the total sample by controlling the impact of company size and industry on GHG disclosures. The results are presented in Table 3.

The results of Model 1 indicate that there is a significantly negative association between GHG disclosures and companies from EU countries. The coefficients for Japan and Canada are statistically insignificant.

The *t*-test results as well as regression results indicate that there is comparatively lower GHG disclosures in EU countries compared to the Japanese and Canadian companies. These results thus do not support our hypothesis H1 that GHG disclosures by EU firms are higher compared to

Table 2. Descriptive Statistics.

Variable		Mean	Median	Maximum	Minimum	Standard Deviation
Panel A						
All firms in the sample						
Disclosure index		0.45	0.444	0.9	0	0.262
Revenues	($Billions)	20.98	9.71	318.58	0.252	36.48
	$n = 282$					
Panel B						
EU firms overall						
Disclosure index		0.39	0.4	0.9	0	0.268
Revenues		26.11	11.02	318.58	0.252	45.33
	$n = 148$					
EU firms by country						
France						
Disclosure index		0.48	0.5	0.8	0	0.259
Revenues		32.81	17.52	189.49	3.68	41.5
	$n = 32$					
Germany						
Disclosure index		0.332	0.3	0.8	0	0.261
Revenues		46.62	22.42	185.9	4.5	48.81
	$n = 25$					
UK						
Disclosure index		0.387	0.4	0.9	0	0.308
Revenues		20.65	6.72	274.3	1.536	48.36
	$n = 31$					
Japanese firms						
Disclosure index		0.54	0.555	0.89	0	0.235
Revenues		17.17	9.83	179.08	1.22	24.03
	$n = 106$					
Canadian firms						
Disclosure index		0.48	0.555	0.89	0	0.242
Revenues		8.31	6.08	30.16	1.27	7.42
	$n = 28$					
Panel C						
All firms reporting carbon emissions						
Disclosure index		0.64	0.67	0.9	0.3	0.162
Revenues 2005		28.26	12.85	318.85	1.39	47.14
Carbon emissions 2006 (miles kilotonnes)		13	2.81	150.5	0.001	23.13
Carbon emissions 2004		12.78	3.37	120.7	0.000276	22.7
	$n = 129$					

Table 2. (*Continued*)

Variable		Mean	Median	Maximum	Minimum	Standard Deviation
Panel D						
EU Firms						
Disclosure index		0.598	0.6	0.9	0.3	0.18
Revenues 2005		39.34	15.65	318.85	1.39	61.76
Carbon emissions 2006		18.95	5.7	150.5	0.001	29.06
Carbon emissions 2004		18	5.24	120.7	0.002	28.63
	$n = 59$					
Japanese firms						
Disclosure index		0.67	0.67	0.89	0.33	0.14
Revenues 2005		21.27	12.42	179.08	2.08	28.88
Carbon emissions 2006		7.72	0.95	0.65	0.005	15.6
Carbon emissions 2004		7.69	0.946	64	0.00276	14.85
	$n = 58$					
Canadian firms						
Disclosure index		0.698	0.67	0.89	0.33	0.116
Revenues 2005		7.6	5	23.6	1.62	6.68
Carbon emissions 2006		9.28	4.46	37.51	0.139	12.26
Carbon emissions 2004		12.78	3.37	120.7	0.002	22.7
	$n = 12$					

Canadian and Japanese firms. A plausible explanation for these results may be that despite head start by EU, the Canadian and Japanese companies have been more concerned to reduce GHG pollution emissions. Another explanation could be that there is a higher gap between GHG performance and GHG disclosures by Canadian and Japanese companies than EU companies.

Disclosures within EU Countries

The regression results focusing on companies from France, Germany and the UK along with Japanese and Canadian companies are provided in Table 3, Model 2. The results provided by this model provide an insight into

Table 3. Regression Results on Pollution Disclosures.

Variables	Coefficient	*T*-Statistics
Model 1: EU, Japan and Canada with Industry and Size		
Intercept	–1.8	–5.96*
Size	0.096	7.31*
EU	–0.15	–3.16*
Japan	0.02	0.39
Canada	–0.02	–0.39
Chemicals	0.116	2.62*
Utilities	0.268	6.04*
Materials	0.164	3.83*
Oil and gas	0.142	2.93*
Cptl Gds/ConsDur	0.073	1.70***
Adjusted R^2		0.26
F-value		13.68*
Model 2: UK, France, Germany, other EU, Japan and Canada with Industry and Size		
Intercept	–1.92	–6.12*
Size	0.101	7.41*
France	–0.114	–1.71***
Germany	–0.25	–3.70*
UK	–0.165	–2.72*
Other EU	–0.143	–2.76*
Japan	0.011	0.211
Canada	0.06	1.18
Chemicals	0.121	2.74*
Utilities	0.254	5.66*
Materials	0.156	3.62*
Oil and gas	0.124	2.53*
Cptl Gds/ConsDur	0.07	1.63***
Adjusted R^2		0.27
F-value		10.48*

*Significant at .01 level.
**Significant at .05 level.
***Significant at .1 level.

disclosures from different EU countries. The results indicate that there is significantly negative association between GHG disclosures by German, French, the UK and other EU companies, whereas this association is insignificant for Japan and Canada. We therefore do not find any significant difference in GHG disclosures by companies from different EU countries. These results do not support our hypothesis H2 that there are differential GHG disclosure practices by companies in different EU countries.

These results indicate that cultural environment have no significant impact on GHG disclosures within the EU countries.

Disclosures of Carbon Emissions by EU Companies in 2006 Compared to 2004

The EU in their initial foray into implementing the Protocol focused on reducing carbon emissions. The EU commenced this focus in 2005, and it would be of interest to examine how successful have been the EU countries in encouraging firms to report emissions in 2006 compared to 2004. Neither Japan nor Canada had a similar focus (although Canada requires the reporting to the government of their GHG emissions annually). In the sample of 148 EU companies, 59 provided carbon (or GHG) emissions for 2004 and 2006. Of these companies, 24 reduced their raw emissions and 35 had an increase. In terms of tons of emissions/$revenue 20 reduced emissions and 39 increased. It would appear that the changes in production made no difference.

For the 106 Japanese companies in the sample, 58 reported emissions for 2004 and 2006. Of these companies 28 decreased their emissions and 30 increased them. On a tons of emissions/$revenue basis 22 decreased and 36 increased emissions. This result is similar to the EU, but more companies proportionally reported their emissions.

Finally, of the 28 Canadian companies 12 reported emissions for 2004 and 2006. In terms of raw emissions 6 decreased and 6 increased. On a revenue basis 4 decreased and 8 increased. Thus, Canadian results are similar to the other two states.

Association between GHG Disclosures and Carbon Emissions

We included a new variable of CBN in the regression tests to evaluate the association between GHG disclosures and carbon emissions. The variable CBN represents the percentage change in emissions from 2004 to 2006. Since only 128 companies provided the needed emissions data, the sample is reduced by more than a half. Therefore, we reduce our country variables to the EU, Japan and Canada, and, at first, we keep industry variables in the regression. However, since the industry variables reduce the R^2, we provide the results without industry data. The results on the association between disclosures and change in carbon emission are presented in Table 4.

Table 4. Regression Results with Reported Carbon Emissions.

Variables	With Japan Coefficient	*T*-Statistics	With Canada Coefficient	*T*-Statistics
Intercept	0.549	4.84*	0.532	5.053*
Change in emission	11.76	.76	11.76	0.76
Size	0.006	1.36	0.006	1.36
Japan	−0.017	−.32	0.016	.32
EU	−1.01	−1.98**	−0.08	−2.82*
Adjusted R^2	.05		0.05	
F-value	2.67**		2.67**	

*Significant at the .01 level.
**Significant at the .05 level.

The only statistical significant variable is the EU. The company size variable and change in carbon emissions are insignificant (the regression results with Canada instead of Japan are similar). The *t*-test results comparing disclosure means of the countries, however, are statistically significant. The EU companies disclose significantly less compared to the Japanese companies ($t = 2.53$, prob. $= .006$) and Canadian companies ($t = 2.42$, prob. $= .01$). The disclosure means of EU, Japan and Canada are respectively .598, .674 and .698. Based on the regression results, we conclude that there is no statistically significant association between GHG disclosure and GHG performance (as defined as the change in carbon emissions) and that the EU companies providing carbon data disclose significantly less compared to Japanese and Canadian companies.

CONCLUSION

The Kyoto Protocol went into effect in February 2005 and countries from the EU had already had a plan in place to implement the Protocol. Focusing on carbon emissions, the EU countries set up a system to allocate carbon credits so that firms would be able to focus on reducing carbon emissions. The Japanese and Canadian companies were also affected by the start of the Kyoto Protocol. Facing the same timeline as the EU companies in terms of reducing GHG emissions, companies from these countries would need to determine how best to achieve emission reductions. Although these countries did not create a mandated scheme to aid companies in the emission reductions they did make some attempt to address the problem.

Since the EU started to implement their plan it would seem logical that the EU companies would have better GHG disclosures than Japanese and Canadian companies. The results, however, indicate that the stakeholders of Japanese and Canadian companies are being provided more extensive data concerning global warming compared to stakeholders of EU companies. Despite the push by EU companies to reduce carbon emissions, based on data disclosed by companies in this sample, it appears that the EU companies are not providing better disclosures on GHG emissions compared to the Japanese and Canadian companies. This finding suggests that despite what may be construed as marginally better GHG performance, companies may not have better GHG disclosure. In order to ensure better disclosures, there may be need for mandatory disclosure requirements.

Caution is, however, needed in interpreting the findings of this study because of a number of limitations. Although we examined the largest companies from these countries, these companies may not represent the typical company impacted by the Protocol. We utilized a disclosure index which we partly derived from the CDP questionnaire and from self-reported data from various venues. Therefore validity of this information depends on the integrity of those providing this information (although some of the information was audited). Finally, what the study presents is a snapshot of the first steps in trying to reduce the precursors to global warming. All of the countries that ratified the Kyoto Protocol and are expected to reduce the GHG emissions by 2012 need to begin to take steps to make reductions a reality. The fact that some firms in the EU, Japan and Canada have made some first tentative steps and that some companies are informing their stakeholders of their progress (or lack thereof), we think is a good start. We hope that more and more companies would start disclosing this information so that investors in particular and society in general are better informed. A better informed public can take the needed steps to eliminate global warming. More importantly, companies need to reduce their GHG emissions as they promised to do under the Kyoto Protocol.

NOTES

1. The sample of EU countries includes three firms from countries that are not in the EU-15: Cez (Czech Republic), MOL (Hungary) and KGH Polska Miedz (Poland). Inclusion of these companies does not significantly change any of the results of the analyses.

2. The process for doing the content analysis of the documents was as follows: first, one of the authors and a research assistant independently examined all of the

publicly available disclosures (some of the companies chose not to make their disclosures available) in the CDP questionnaires. Discrepancies required re-examining the documents until a consensus was reached. Then both parties independently examined all of the pertinent information on the companies' websites. Again any discrepancies were ironed out. The major differences occurred because of timing. The research assistant sometimes had documents that were not available to the author so we chose to utilize the latest information available.

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SOCIAL AND ENVIRONMENTAL ACCOUNTING IN NORTH AMERICA: A RESEARCH NOTE

Charles H. Cho and Dennis M. Patten

INTRODUCTION

This investigation/report/reflection was motivated largely by the occasion of the first Centre for Social and Environmental Accounting Research (CSEAR) "Summer School" in North America.[1] But its roots reach down as well to other recent reflection/investigation pieces, in particular, Mathews (1997), Gray (2002, 2006), and Deegan and Soltys (2007). The last of these authors note (p. 82) that CSEAR Summer Schools were initiated in Australasia, at least partly as a means to spur interest and activity in social and environmental accounting (SEA) research. So, too, was the first North American CSEAR Summer School.[2] We believe, therefore, that it is worthwhile to attempt in some way to identify where SEA currently stands as a field of interest within the broader academic accounting domain in Canada and the United States.[3] As well, however, we believe this is a meaningful time for integrating our views on the future of our chosen academic sub-discipline with those of Gray (2002), Deegan and Soltys (2007), and others. Thus, as the title suggests, we seek to identify (1) who the

Sustainability, Environmental Performance and Disclosures
Advances in Environmental Accounting and Management, Volume 4, 161–177

ISSN: 1479-3598/doi:10.1108/S1479-3598(2010)0000004010

SEA researchers in North America are; (2) the degree to which North American–based accounting research journals publish SEA-related research; and (3) where we, the SEA sub-discipline within North America, might be headed. We begin with the who.

WHO?

To identify the North American–based researchers in SEA, we relied first on Hasselback's annual directory of accounting faculty (Hasselback, 2006). Hasselback (2006) includes an extensive listing of accounting faculty members from U.S. and Canadian schools as well as other universities from across the globe.[4] Among other pieces of information, the directory identifies each accounting faculty member's self-selected teaching/research interests. In total, 26 sub-discipline choices are available, one of which (coded "W" by Hasselback) is "social." Faculty member teaching/research interests are not limited to a single area, but a maximum of four choices is listed for each person. We hand-reviewed the directory and compiled a list of all accounting faculty members including "W" within their teaching/research interests (see Appendix A for North American members of the list). Table 1 summarizes this review.

As noted in Panel A of Table 1, worldwide, 119 of the 8,501 (1.40%) accounting faculty members included in Hasselback (2006) indicate an interest in social accounting teaching/research. However, as revealed in

Table 1. Accounting Faculty Members Identifying Themselves as Having a "Social" Teaching/Research Interest[a].

	Social Interest	Total Sample	Percent
Panel A			
Worldwide	119	8,501	1.40
Panel B			
Non-North America	76	1,960	3.88
North America	43	6,541	0.66[b]
Panel C			
Canada	17	473	3.59
United States	26	6,068	0.43[b]

[a]As classified in Hasselback (2006).
[b]Difference is significant at $p < .01$, two-tailed.

Panel B of Table 1, interest in social accounting in North America does not appear comparable to its interest in the rest of the world. Whereas 76 of 1,960 accounting faculty members from institutions outside of North America (3.88%) list social as an interest, only 43 of the 6,541 North American–based faculty members (0.66%) follow suit.[5] A chi-squared test indicates this difference in proportions is statistically significant at $p < .01$, two-tailed.

This finding, too, however, is misleading. When partitioned across Canadian versus U.S. faculty members (see Panel C of Table 1), results show a disparity of interest in social accounting within North American–based accounting faculty members. Seventeen of 473 Canadian faculty members (3.59%) indicate a social interest, whereas only 26 of 6,068 U.S. accounting faculty members (0.43%) do so. This difference is also statistically significant at $p < .01$, two-tailed.[6]

The results of our initial analysis paint a somewhat mixed picture of the state of SEA research in North America. Certainly, it is encouraging that interest in the topic across Canadian faculty members appears comparable to the interest shown by the rest of the world (and perhaps helps explain why the first North American CSEAR Summer School was held north of the border). But in contrast, the finding that such a low percentage of U.S. accounting faculty members indicates an interest in social accounting teaching/research is, well, somewhat depressing. Given Deegan and Soltys's (2007) claim that none of the top four North American–based accounting research journals published any social accounting articles over their period of review, however, such a lack of interest should perhaps have been expected.

WHERE?

In an effort to buoy our spirits, we turn to the second phase of our investigation, the "where" of North American SEA research. More specifically, we attempt to identify, not where researchers from Canada and the United States are publishing their SEA work, but rather the extent to which North American–based accounting research journals are publishing SEA papers. We acknowledge without counting that the four sub-discipline-specific journals based in North America, *Accounting and the Public Interest* (*API*), *Advances in Environmental Accounting and Management* (*AEAM*), *Advances in Public Interest Accounting* (*AIPIA*), and *Critical Perspectives on Accounting* (*CPA*), are leaders in this regard. We thank them

for all they do for us, but now we turn to the issue of other, some might argue, more "mainstream" accounting journals.

The primary intent of this aspect of our examination is to identify the extent to which these more mainstream North American–based accounting research journals have been publishing SEA research. And, although as noted earlier, Deegan and Soltys (2007) claim the top four of these journals – *Journal of Accounting Research* (*JAR*), *The Accounting Review* (*TAR*), *Journal of Accounting and Economics* (*JAE*), and *Contemporary Accounting Research* (*CAR*) – published none, we, like Gray (2007, p. 28) in the *Social and Environmental Accounting Journal*, must "quibble with" that finding. We believe that over the period reviewed by Deegan and Soltys (2007) – 1995 through 2006 – *TAR* actually published three articles that can be included as SEA related (Hughes, 2000; Joshi, Krishnan, & Lave, 2001; Clarkson, Li, & Richardson, 2004), whereas *JAR* (Kennedy, Mitchell, & Sefcik, 1998) and *CAR* (Li, Richardson, & Thornton, 1997) had one each. Furthermore, if the time frame is extended just slightly (to include 1994 publications), *JAR* picks up one more SEA article (Barth & McNichols, 1994) and *JAE* (Blacconiere & Patten, 1994) joins the list. We concede that each of these articles is strictly related to environmental information and each is strongly positivistic in design. But, as Gray (2002) notes, environmental accounting and reporting is within the social accounting domain, and as such, we include the articles in our count (Table 2). That

Table 2. SEA-Related Articles Published in Selected North American–Based Accounting Research Journals over the Period 1988 through 2007.

Journal	Number of SEA Articles
Top-tier journals	
The Accounting Review	3
Journal of Accounting Research	2
Contemporary Accounting Research	1
Journal of Accounting and Economics	1
Second-tier journals	
Journal of Accounting and Public Policy	22
Journal of Accounting, Auditing and Finance	9
International Journal of Accounting	7
Accounting Horizons	2
Journal of Accounting Literature	1
Review of Accounting Studies	0

having been done, seven publications in four journals over a 13-year period is not exactly enough to wash our depression away.[7]

Deegan and Soltys (2007, pp. 77–78) surmise that possible explanations for the lack of (here we would substitute "limited") SEA research published in the top-tier North American accounting journals include a potential overt choice by SEA authors to not bother submitting to these journals or that editorial "gatekeepers" exclude the work regardless of quality. If such explanations are valid, we might expect to find more SEA-related research being published in the next tier of accounting research journals. To test this hypothesis, we reviewed the publication histories for six additional North American–based research journals that are often included in the "second-tier" with respect to quality rankings. These journals are *Accounting Horizons* (*AH*), *International Journal of Accounting* (*IJA*), *Journal of Accounting, Auditing and Finance* (*JAAF*), *Journal of Accounting and Public Policy* (*JAPP*), *Journal of Accounting Literature* (*JAL*), and *Review of Accounting Studies* (*RAS*). We purposely excluded the more sub-discipline-specific journals – *Auditing: A Journal of Practice and Theory*, *Journal of the American Tax Association*, *Behavioral Research in Accounting*, and *Journal of Management Accounting Research*.

The results of our review of second-tier journals, summarized in Table 2, are, at best, only mildly encouraging. On the negative end of the spectrum, three of the journals, *AH*, *JAL*, and *RAS*, published fewer SEA-related articles over the period than *TAR*. Indeed, *RAS* published none. Only *JAPP*, with 22 SEA-related articles over the 20-year period, seems worthy of note as a potentially significant outlet for SEA researchers.[8]

In general, the results of our "where" investigation raise what we believe is a potentially serious concern. The issue is not that we as SEA researchers have no place to publish. As noted earlier, *API*, *AEAM*, *AIPIA*, and *CPA* all publish significant amounts of SEA research. Furthermore, as documented by Deegan and Soltys (2007), substantial SEA research is being published in the non-North American accounting journals *Accounting, Auditing and Accountability Journal* (*AAAJ*) and *Accounting Forum* (*AF*) and, to a lesser extent, *British Accounting Review* (*BAR*), and *European Accounting Review* (*EAR*), as well as the more cross-discipline outlets *Journal of Business Ethics* (*JBE*) and *Business Strategy and the Environment* (*BSE*). And, of course, as so well discussed by Gray (2002), *Accounting, Organizations and Society* (*AOS*) has been instrumental in the dissemination of SEA-related research. Instead, the concern is one of visibility, and thus viability, within the larger accounting domain. We will discuss this issue later.

WHO AGAIN

As already noted earlier, only a scant 43 North American accounting faculty members indicated, through their Hasselback (2006) listing, an interest in the social area. And yet, in conducting our review for SEA-related articles, we could not help but notice that many of the authors of these pieces were not among the self-chosen few. This suggests that reliance on the Hasselback (2006) listings may have led, at least partly, to an overly pessimistic evaluation of who the SEA researchers in North America really are. As such, we returned to the "who" question with an alternative approach. For this second attempt at identifying the North American accounting academics working in the SEA area, we relied on our review of publications. However, in addition to articles in the mainstream North American journals reported earlier, for this stage of analysis, we also reviewed for North American–based authors of works in *API*, *AEAM*, *AIPIA*, *CPA*, *AAAJ*, *AF*, *AOS*, *BAR*, and *EAR*.[9] As before, our review covered the period from 1988 to 2007.

As reported in Table 3, we identified 161 North American–based accounting faculty members who, although not indicating a "social" interest in Hasselback (2006), published at least one SEA-related article over our period of review. Of the total, 28 were affiliated with Canadian schools whereas 133 were U.S. based. Clearly, SEA appears to appeal to a far greater number of North American accounting faculty members than our initial Hasselback (2006) review would suggest. This leads, we believe, to two questions: (1) Why is there such a disparity? And (2) is this a problem?

Table 3. Number of North American–Based Accounting Faculty Members not Identifying Themselves as Having a "Social" Interest but Publishing At Least One SEA-Related Article over the Period 1988 through 2007.

Canadian faculty members	28
U.S. faculty members	133
North American total	161

Notes: Designation as having a "social" interest was based on listings in Hasselback (2006). Publication review included the journals *AAAJ*, *AEAM*, *AF*, *AH*, *AIPIA*, *AOS*, *API*, *BAR*, *CAR*, *CPA*, *EAR*, *IJA*, *JAAF*, *JAE*, *JAL*, *JAPP*, *JAR*, *RAS*, and *TAR*.

Reconciling the Differences

We believe there are likely two major explanations for why the Hasselback (2006) identification of social interest is so much lower than the apparent number of faculty pursuing SEA research. First, not all faculty members with an interest in SEA research indicate so in the directory. We *know*, for example, that there are North American–based accounting faculty members whole-heartedly interested in the social domain who do not have the "W" in their Hasselback (2006) listing. Such omissions could be due to a faculty member generating his or her interest in the social area subsequent to making a Hasselback classification decision (and not subsequently updating the information),[10] delineating the choice purely based on teaching interests,[11] or perhaps even fear of ostracism from more "traditional" peers. We suspect, however, that this explanation likely captures only a small part of the "missing W's," and we further suspect that those within this category are probably actively engaged in the sub-discipline with respect to their conference (and session) choices, their reading, and, we hope, their core beliefs.

A second factor with the Hasselback (2006) scheme that may be leading to reduced reporting of interest by faculty members is the use of the term "social" for the area. As noted by Gray (2002), although the social accounting project is both sympathetic to and influenced by the alternative/critical stream of accounting research, there appears to be a bit of reluctance on the part of the alternative/critical researchers to embrace with it. A similar reticence may exist for researchers who consider themselves interested in environmental accounting work, but who either fail to see or choose not to believe, it is within the social domain. In support of such a claim, we note that in the 2006–2007 Canadian Academic Accounting Association Directory, where "environment" is a research interest choice, 64 faculty members are included under that designation.

Ultimately, we believe, whether faculty members conducting SEA-type research choose to designate themselves as "W's" in the Hasselback directory is more than a trivial concern. We concede that it seems very unlikely that anyone (other than us, anyway) uses the listing as a way to identify people interested in SEA. The real problem is that, even if there is a relatively larger group of faculty actively conducting SEA-related research, the low number of W's amongst North American (or at least United States) accounting academics suggests a reticence to embrace with the social accounting project. And that leads us to consider the "whither."

WHITHER SEA IN NORTH AMERICA?

As dedicated members of the SEA community, one of our major concerns is the viability of our sub-discipline. Of course, this issue is not new. More than a decade ago, Mathews (1997) worried that "there are still too few academics and institutions involved in social and environmental accounting, and many have been in the field for a long time; new blood is needed if the area is to take advantage of opportunities for interdisciplinary co-operation" (p. 503). The need for new talent was recently echoed by Owen (2008), who stated that the SEA research field may become "moribund" if it is not constantly "rejuvenated" by emergent scholars (p. 251). Unfortunately, Deegan and Soltys (2007), reflecting on the Australasian research community, reported a "lack of 'take-up' in the [SEA] area in terms of the scale of participation" (p. 73). They suggest this may at least partly be due to possible career impediments faced by emergent scholars in SEA related to the use of journal rankings for assessment of research productivity.[12]

We concede that we do not know if having only 3 or 4 of every 100 accounting academics expressing an interest in the social domain will be enough to guarantee the long-term viability of the sub-discipline. What our analysis does document, however, is that the issue of viability that Mathews (1997), Owen (2008), and Deegan and Soltys (2007) lament is even more pronounced in the U.S. arena. We would like to believe that, consistent with findings from the rest of the world, 3% or 4% of U.S. accounting academics might actually harbor some interest in the social domain. But to attract this new blood in the United States (whether that be doctoral students or existing academics), the sub-discipline needs, we believe, to have greater visibility.

Certainly, publications constitute an important visibility factor, and the almost complete failure of the North American–based top-tier journals – those most likely to have exposure in U.S schools' Ph.D. programs[13] – to include SEA research means we face a great hurdle in reaching students as they work toward their doctoral degrees. And while we hope that recent calls for the elite journals to expand beyond their almost exclusive focus on positivistic financial research (see, e.g., Hopwood, 2007) will lead to acceptance and publication of more SEA articles, we remain skeptical. What we are more optimistic about is that today's electronic world means students, inadvertently perhaps, are more likely in their web forays to encounter SEA research published in other outlets. It may be wishful thinking, but we would like to believe that finding out there is another

accounting world out there may be the only catalyst needed to convert at least a few.

Ultimately, just hoping that emerging accounting scholars in the United States serendipitously happen upon the SEA world is not likely to substantially build our ranks. Instead, we believe it is critical for the existing community to take active steps to expand our visibility. To that end, organizing (and more aggressively publicizing) additional North American CSEAR conferences, particularly in the United States, would seem imperative.[14] These gatherings can serve as a vehicle not only for bringing together existing SEA researchers who likely see themselves as being somewhat isolated in the more mainstream accounting world (see, e.g., Frost, 2007) but also perhaps more importantly (and as noted by Bebbington & Dillard, 2007) offer a much needed mentoring opportunity relative to new entrants to the community. But, of course, unless we can find a way to let the potential "new blood" know of our existence, holding conferences (that they do not attend) would not do much. As such, we believe it also important for members of the SEA sub-discipline to continue to make themselves more visible within the larger and more mainstream academic accounting community. This can be accomplished by presenting more at American Accounting Association conferences, attempting to publish more in the mainstream journals, and even just by flaunting our "W-ness" on personal websites, and, of course, in the Hasselback directory.

In summary, we believe in the importance of the social accounting project. As Gray (2002) argues, "social accounting is re-emerging and issues such as transparency and social justice can be heard in boardrooms … But the degree to which they are captured depends (at least in part) on the extent of engagement by those with concerns in the field" (p. 700). We would like to hope there are many in the North American academic accounting community who can add to this engagement. But we fear that unless we, the too limited existing members of our group, do more to let them know the sub-discipline is out here, they will never be part of the solutions our world so desperately needs.

NOTES

1. CSEAR is based at the University of St. Andrews in St. Andrews, Scotland. The organization provides support relative to teaching, research, and practice of

social, environmental, and sustainability accounting. CSEAR has been sponsoring and organizing annual congresses in Scotland (often referred to as "Summer Schools") for 20 years. The first CSEAR Summer School in North America took place July 7–9, 2008, in Montreal, Canada.

2. Just as Deegan and Soltys (2007) had insight into the motivations of the first Austalasian Summer School because one of the authors was a co-organizer of that event, we have insight into the motivations of the North American Summer School because one of the authors of this note is the event's primary organizer.

3. We acknowledge that, geographically, Mexico is also considered a part of North America. But because our source for faculty affiliations (Hasselback, 2006) includes no university listings for Mexico, we focus only on Canadian and U.S. contributors.

4. Although Hasselback (2006) is reasonably comprehensive in the inclusion of U.S. and Canadian schools, the coverage of non-North American institutions is far less complete. The results of our analyses including the non-North American data, therefore, should be interpreted with caution.

5. By way of contrast, and perhaps helping to explain Deegan and Soltys's (2007) observation that Australasian authors contributed disproportionately more to the published SEA research they reviewed, 47 of the 1,020 accounting faculty members from Australasian schools (4.61%) indicated an interest in the social area.

6. The percentage of Canadian accounting faculty members indicating an interest in the social area is not significantly different from the percentage of faculty from non-North American institutions.

7. Sadly, when we extend the review to the full 20-year period, we employ for our review of other North American–based journals (1988 through 2007), the count for these top four journals remains unchanged.

8. It is also worth noting that *JAPP* is the only non-sub-discipline journal with an informational link on the American Accounting Association's Public Interest Section website.

9. For this stage of the analysis, we tried to limit our listing to accounting faculty only. If departmental affiliation was not listed with the article, we checked, first, whether authors were included in Hasselback (2006). If not included there, we went to specific university websites to attempt to identify departmental affiliation. We accept responsibility for any errors or omissions in our classifications.

10. We concede that we are not aware of how, how often, or if Hasselback allows for updates of these areas.

11. Casual evidence suggests that most of the SEA researchers we know teach classes in the more "traditional" lines such as financial and managerial accounting.

12. Interestingly, Owen (2008) does not share this view as he does not see, at least in the UK context, any evidence that undertaking SEA research is detrimental to an academic career (see also Bebbington & Dillard, 2007).

13. There are a few accounting doctoral programs in the United States that appear to be more open to alternative research ideas. Worthy of particular note, we believe, are Baruch, Central Florida, and North Texas.

14. The second North American CSEAR conference will take place in Orlando, Florida, in January 2010.

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APPENDIX A. ACCOUNTING FACULTY WITH "SOCIAL" (W) LISTED AS A TEACHING/RESEARCH INTEREST

Name	Institution
United States (n = 26)	
Canavan, Martin	Skidmore
Carroll, Joan	SUNY-Oswego
Cherry, Alan	Loyola Mary Mt.
Critchett, John	Madonna
Dillard, Jesse	Portland State
Drtina, Ralph	Rollins
Freedman, Marty	Towson
Graves, Finley	North Texas
Hammond, Theresa	Boston College
Harris, Jean	Penn State-Harris.
Hicks, Donald	Christ. Newport
Hutchinson, Paul	North Texas
Kerthly, John	St. Louis University
Lancaster, Kathryn	Cal Poly-SLO
Lehman, Cheryl	Hofstra
Moran, Tim	Aurora
Patten, Dennis M.	Ill. State
Reynolds, Mary Ann	West. Wash.
Sefcik, Stephen	Washington
Shapiro, Brian	St. Thomas-MN
Stanwick, Sarah	Auburn
Steadman, Mark	E. Tenn. State
Sutton, Steve	UCF
Tinker, Tony	CUNY-Baruch
Ward, Burke	Villanova
Yuthas, Kristi	Portland State
Canada (n = 17)	
Brooks, Leonard	Toronto
Buhr, Nola	Saskatchewan
Cooper, David	Alberta
Draimin, K. Charles	Concordia
Entwhistle, Gary	Saskatchewan
Gaa, James	Alberta
Gendron, Yves	Alberta
Graham, Cameron	York
Hicks, Elizabeth	Mt. St. Vincent
Kim, Seon	Saskatchewan

APPENDIX A. (*Continued*)

Name	Institution
MacAulay, Ken	St. Francis Xavier
Naud, Marjolaine	HEC Montréal
Russell, John	Saskatchewan
Shearer, Teri	Queen's
Simmons, Cynthia	Calgary
Suddaby, R.	Alberta
Wright, Michael	Calgary

APPENDIX B. NON-"W" ACCOUNTING FACULTY WITH AN SEA-RELATED PUBLICATION (1988–2007)

Name	Institution
United States (n = 133)	
Adhikari, Ajay	American University
Akathaporn, Parporn	Western Wash.
Alciatore, Mimi L.	Houston
Alnajjar, Fouad	Davenport
Anderson, Allison	American University
Arnold, Patricia	Wisc. – Milw.
Arrington, C. Edward	LSU
Bae, Benjamin	Central Wash.
Baker, C. Richard	Adelphi
Barsky, Noah	Villanova
Barth, Mary E.	Harvard
Beets, S. Douglas	Wake Forest
Belkaoui, Ahmed	Ill-Chicago
Bernardi, Richard A.	Roger Williams
Blacconiere, Walt	Indiana
Boer, Germain	Vanderbilt
Boland, Richard J.	Case Western
Brown, Darrell	Portland State
Burnett, Royce D.	University of Miami
Callaghan, Joseph	Oakland University
Campbell, Catherine	Connecticut
Cataldo, A. J.	West. Michigan
Chavis, Berry M.	Cal. St. – Ful.
Christensen, Theodore E.	BYU
Colignon, Richard	Washington

APPENDIX B. (*Continued*)

Name	Institution
Covaleski, Mark A.	Wisconsin
Crampton, William	Illinois State
Dee, Carol Calloway	Florida State
Dirsmith, Mark W.	Penn. State
Easton, Peter	Notre Dame
Elmendorf, Richard G.	Wyoming
Epstein, Marc J.	Stanford/Rice
Fekrat, M. Ali	Georgetown
Fleischman, Richard	John Carroll
Flesher, Dale L.	Mississippi
Fogarty, Tim	Case Western
Francis, Jere	Iowa
Gamble, George O.	Houston
Ghicas, Dimitrios	Baruch
Gould, Steven	Baruch
Graham, Allan	Rhode Island
Gramlich, Jeffrey D.	So. Maine
Grinnel, Jacque	Vermont
Hansen, Don A.	Oklahoma St.
Hayes, Rick Stephen	Cal. State-LA
Housel, Thomas J.	Naval Postgrad
Hsu, Kathy	Houston
Hughes II, K. E.	LSU
Hughes, Susan	Butler
Hunt III, Herbert	Cal. State – LB
Hussein, Mohamed E.	Connecticut
Ilinitch, Anne Y.	North Carolina
Inclan, Carla	Georgetown
Jablonsky, Stephen F.	Penn. State
Jackson, Cynthia J.	Houston
Jaggi, Bikki	Rutgers
Johnston, Derek	Colorado State
Joseph, George	Mass-Lowell
Joshi, Satish	Mich. St.
Karim, Khondkal E.	Rochester Tech
Karpik, Philip G.	Ill-Chicago
Kennedy, Jane	Washington
Ketz, J. Edward	Penn. State
Khurana, Inder	Missouri
Kite, Devaun	NE Louisiana

APPENDIX B. (*Continued*)

Name	Institution
Koutsomudi, Athina	Baruch
Krishnan, Ranjani	Michigan State
Kumar, Kamalesh	Mich-Dearborn
Lacina, Michael	Houston-CL
Lave, Lester	Car. Mellon
Lawrence, Carol M.	Missouri
Lee, Tom	Alabama
Little, Philip	West Carolina
Liunat, Joshua	NYU
Maher, John J.	Virg. Tech.
Mahoney, Lois	East. Mich.
Manicas, Peter	Hawaii
Marshall, R. Scott	Portland State
McInness, Morris	Suffolk
McNichols, Maureen F.	Stanford
Merino, Barbara	North Texas
Mishra, Mirenda K.	Texas-Dallas
Mitchell, Terence	Washington
Moaghalu, Michael I.	Pittsburgh State
Mobu, Janet	Wash-Tacoma
Mouck, Tom	New Mexico
Nance, Jon	SW Missouri
Nelson, John S.	Iowa
Newman, D. Paul	Texas
Niemark, Marilyn	Baruch
Northcut, W. Dana	Chicago
Okcabol, Fahrettin	Mary.-E. Shore
Preston, Alistair	New Mexico
Quintana, Olga	University of Miami
Radtke, Robin P.	Houston
Reitenga, Austin L.	Houston
Reiter, Sara	SUNY-Bing.
Reynolds, J. Kenneth	LSU
Rezaee, Zabiholla	Mid. Tenn. St.
Rigsby, John T.	Miss. State
Roberts, Robin	UCF
Robison, H. David	LaSalle
Rockness, Joanne	NC State
Rodgers, Waymond	Cal-Riverside
Ruchal, Linda	Nebraska

APPENDIX B. (*Continued*)

Name	Institution
Rutledge, Robert W.	Tx St-SMarc
Sami, Heibatollah	Temple
Sanders, James F.	Butler
Savage, Arline	Oakland
Schlachter, Paul	Florida Int'l
Schwartz, B. N.	Ind-So Bend
Shane, Philip B.	Penn. State
Shields, David	Houston
Sinha, Nishi	Boston University
Smith, Joyce vdL	VCU
Soderstrom, Naomi S.	Colorado
Stagliano, A. J.	St. Joseph's
Stewart, Ross E.	Seattle Pacific
Stinson, Christopher H.	Texas
Stone, Brett A.	SUNY New Pl.
Streeter, Denise W.	San Jose State
Swanson, G. A.	Tenn. Tech.
Thornton, John M.	Washington St.
Tondkar, Rasoul H.	VCU
Trompeter, Gregory	Boston College
Tyson, Thomas	St. John Fisher
Walden, W. Darrell	Richmond
Walsh, Mary Jeanne	LaSalle
Walter-York, L. Melissa	Drexel
Wasley, Charles	Wash Univ.
Williams, Paul	NC State
Wisner, Priscilla S.	Mont. State
Young, Joni	New Mexico
Canada (n = 28)	
Ahmed, Sadrudin	Ottawa
Amernic, Joel	Toronto
Berthelot, Sylvie	Moncton
Bewley, Kathryn	York
Breton, Gaëtan	UQAM
Cho, Charles	Concordia
Clarkson, Peter	Simon Fraser
Cormier, Denis	UQAM
Côté, Louise	HEC Montréal
Everett, Jeff	Calgary
Gordon, Irene	Simon Fraser

APPENDIX B. (*Continued*)

Name	Institution
Green, Duncan	Calgary
Herremans, Irene	Calgary
Li, Yue	Toronto
MacIntosh, Norman	Queen's
Magnan, Michel	Concordia
Magness, Vanessa	Ryerson
Morgan, Gareth	York
Neu, Dean	Calgary
Oakes, Leslie	Alberta
Pedwell, Kathryn	Ottawa
Rahamm, Abu Shraz	Calgary
Richardson, Alan	York
Richardson, Gordon L.	Toronto
Thornton, Dan	Queen's
Warsame, Hussein	Calgary
Welker, Michael	Queen's
Zeghal, Daniel	Ottawa