Abstract

The theory of autopoiesis argues that all living systems are organisationally closed, autonomous systems of interaction whose only concern is self-reproduction. It is controversial whether this biological theory extends to social organisations, such as business firms. If it does, a possible implication is that, in the pursuit of self-interest and capital accretion, business organisations could be destroying the social and ecological environments on which we all depend. A question arises about human beings’ ability to control biological drives. If we view the biological theory as simply a metaphor, we can hold an alternative view that organisations are social constructs, and as such are capable of being open to signals from the outside about social and environmental considerations. The tension between real and social constructivist understandings of autopoiesis is reviewed. The possibility or otherwise of interpenetration of business firms by human values is considered with recent evidence from surveys of ‘sustainability’ practices of firms in New Zealand. There are implications for accounting. Accounting systems play a role in establishing the boundaries of the accounting entity and the accountability of these entities purely for capital accretion or for wider societal concerns. Traditionally, accounting has reflected a realist perspective. Which view prevails, the realist or social constructivist, may have important consequences for our future.
Autopoietic organisations, Accounting, CSR and SCR

Introduction

Accounting is not as philosophical they make out

The above comment was written on a course evaluation by a first-year accounting student. The observation is entirely correct. It is correct, at least, as long as we view accounting as a set of practices for maintaining the status quo. Professional bodies insist on students being familiar with extant generally accepted accounting practices. That is what students want to learn in order to graduate and get a well-paid job. To follow established rules and routines, there is no need to philosophise! For this student, as for most people, accounting is a technical set of procedures involving numbers for representing reality and for making rational decisions. Accountants have long been acknowledged as experts in creating a sense of order. Their view of the world is generally accepted as objective, true and fair, and is indeed a skilled accomplishment. The accountant’s job has traditionally been viewed as that of providing an objective and truthful representation of some underlying reality. Traditional mainstream accounting practice and research took for granted that there was an externally existing reality (Chua, 1986).

Because of the basic assumption that economic reality exists independently of the accountant’s measurements of it, the concept of truth has had an important place in the discourse of accountants. Goldberg (1980) argued that when accountants deviated from the presentation of truth, they were no longer acting as accountants:

The accountant is thus concerned primarily with ascertaining and presenting the truth .... The accountant, qua accountant, is not directly concerned with either propaganda or prudence ... to the extent that he (sic) is concerned, he is widening his responsibility beyond his primary and principal task of the ascertainment and presentation of truth (p. 5).

An alternative view has challenged this epistemology (Morgan, 1988). In Morgan’s view there are multiple truths and realities and it is impossible to capture the truth in a few numbers. According to the alternative, social constructionist, view all accounting is creative. Accounting creates the borders of the entity. Profit does not exist outside the procedures of accounting. By following the rules, the generally accepted principles, we create a profit figure; and the entity for which we account. It is socially constructive; it affects how we see and understand things and how we structure decisions. The idea that accounting creates what it is supposed to measure and report upon is too abstract, philosophical and purposeless for most students (and traditional objectivists). The idea that reality is a social construct, and that we are capable of changing that reality, requires a mental shift. For change to occur we have to appreciate the reason for change. To appreciate the reason for change requires us to question our generally accepted beliefs; to philosophise.
In this paper, the tension between the alternative views of reality and their implications for how we account, i.e., the very nature of accounting practice, is considered. To make the discussion more concrete than philosophical abstractions, and to reinforce its importance to our future existence, an example of systems theory is employed, which, if real, threatens our survival. The theory is a biological theory that tries to explain the functioning of all living systems - that of autopoiesis. Its relevance to corporate social responsibility (CSR), and to accounting practices, will be clarified.

The paper at first presents a brief introduction to the theory of autopoiesis, and then provides a comparison of ‘open’ and ‘closed’ systems thinking to emphasize the differences from conventional understanding. Some evidence from surveys of ‘sustainability’ practices in NZ illustrates the practical implications and leads to a discussion of the implications for accounting/information in organizations, and the necessity for us to reflect on, or philosophise about, unconscious systemic behaviour or the exercise of human agency.

**Systems theory and autopoiesis**

The continued pursuit of economic growth may mean that organisations are destroying the social and ecological environments on which we all depend (Adams, 2004: Milne, Tregidga and Walton, 2009). This myopic behaviour of organisations may be explained in terms of the root metaphor of closed systems or autopoiesis. From a perspective in biological sciences, organisations may be viewed as autopoietic, self-serving, ‘closed’ systems.

Poiesis means ‘dynamic production’, while ‘auto’ means autonomous, independent or self-referential. The theory of autopoiesis evolved from Maturana and Varela’s (1980) exploration of what distinguishes living systems from non-living; and how living systems persist despite changes in structure and components.

In summary, an autopoietic systems approach focuses on:

- autonomy realized through the process of self-referential re-production;
- production of feasible responses to perturbations;
- structural coupling between systems; and
- systems’ persistence and maintenance of identity despite changes in components and structure.

The theory gives an account of living beings from the simplest unicellular organisms (‘first-order unities’) to the most complex multi-cellular organisms (‘second-order unities’) and extends more tentatively beyond organisms to social systems (‘third-order unities’) (Beeson, 2009, p.185). Social organizations, such as business organizations, are examples of third-order unities of networks. An autopoietic system is a living system that exists as a network of relations and processes which continuously produces the components which are the reality (concrete form) of the network. The point about such systems is that they are organizationally
(or operationally) ‘closed’. The behaviour of the system is not specified nor controlled by its environment but by its own structure, which specifies how the system will behave under all circumstances. Systems are not disconnected from their environments, but are in constant interaction with them, in an ongoing process that Maturana and Verela (1987, p.75) call ‘structural coupling’. Changes in the living being are triggered by environmental factors but not determined by them. It is always the structure of the living being that determines the changes. There can be no ‘instructive interactions’ by means of which something outside the system determines behaviour. It is the organizational closure of living systems that produces their autonomy and their individuality.

According to Maturana and Verela (1987) autopoietic systems are systems that define, maintain, and reproduce themselves. This is the essential characteristic of living systems. But it is contentious whether social systems can be regarded as natural living systems. There is disagreement about whether social organizations can be treated as if they were natural living systems, i.e., whether second-order and third-order unities (as described in section 2) are ontologically commensurate. According to Maturin (1980) a social system is:

a collection of interacting living systems that, in the realization of their autopoiesis through the actual operation of their properties as autopoetic unities, constitute a system that as a network of interactions and relations operates with respect to them as a medium in which they realize their autopoiesis while integrating it, is indistinguishable from a natural social system and is, in fact, one such system. (1980,p.11).

Luhmann (1984) has argued for a theory of social interpretation of autopoiesis. However, he retains the non-human aspects of the theory employing a theory of communication rather than human agency (Seidle, 2009, p.135). This has been criticized by Habermas and more recently by Giddens (1984) whose structuration theory involves a dualism between agency and structure. A more humanistic and critical social theory interpretation is offered by Fuchs and Hofkirchner (2009). In their interpretation, humans coproduce and reproduce social structures. They describe a dynamic, dialectical process where society produces and reproduces man as a social being and society and humans produce each other mutually.

Such a view of social organization and autopoiesis provides a means by which human values are reflected in the dynamic reproduction of organizations. The relentless non-human drive for power in all living systems, promoting this struggle over any moral considerations, as described by Nietzsche (and discussed below, p.6), is replaced by the possibility of human aspirations and ethical decision making, even in autopoietic systems.

Yet the reproduction of the systems is dependent on technologies employed. The process of organizing happens at the organizational boundaries and information systems play a role as ‘gatekeepers’ in deciding what information is imported and how it is interpreted (Llewellyn, 2006). The structural information collecting and processing systems of the organization have important effects on what signals (perturbations) are responded to (Scott, 1981, p.173). IT
systems, including accounting, affect the understanding of what to attend to and how to interpret the environment.

The structural coupling between an organization and its environment means that organizations (as autopoietic systems) cannot be controlled or determined from the outside; nevertheless, they have to connect, or resonate, with their environment. Systems can react internally (resonate) to environmental events in accordance with their own structure but they are always changing. They constantly scan the environment for signals. Resonance is achieved whenever signals in the environment are translated into the system’s self-referential operation mode. Governmental intervention is a severe problem for autopoietic theory (Dunshire, 1996). Outside events do not dictate internal changes. The self-referential organisation will attach its own meanings to signals from the outside. However, some social autopoietists (e.g., Teubner, 1992) argue that self-referential systems that share an environment can suggest, stimulate, or influence changes in another system. So it is argued change can occur if sufficient signals are placed in their environment, usually in the form of law or money, but increasingly in the form of ‘knowledge’, and in the form of societal views such as in the area of corporate social responsibility. Signals will be picked up by organizations if they are both socially acceptable and in the system’s interest.

A disturbing consequence of the theory of autopoiesis for information scientists, and for accountants in particular, is the rejection of the notion that information received from the outside can directly affect the system’s behaviour. There is a rejection of the idea that the system builds an internal representation of the world outside. Our theoretical models of rational cognitive planning are rejected. The implications for accounting are discussed later.

**Open systems theory compared to autopoietic**

Traditional approaches to organization theory have been dominated by the idea that change originates in the environment (Morgan, 1986, p.235). A biological metaphor has been widely used to understand how organizations change as a response to the environment. An organization is typically viewed as an open system in constant interaction with its context. Changes in the environment are viewed as presenting challenges to which an organization must respond. Both contingency theorists and population ecologists believe that the major problems facing modern organizations stem from changes in the environment (Morgan, 1986). Accounting systems within organizations too are viewed as responsive to environmental influences and must adapt to ensure organizational survival (Otley, 1980).

At the individual organization level, the main difference with open systems theory relates to the permeability of the organisational boundary. Accounting systems, according to open systems thinking, provide the feedback information for the organization to be in equilibrium with its environment. In autopoietic systems, the boundary is an important barrier. Accounting information is used to differentiate, and in a sense define the organization, as separate from its environment.
It has been suggested that there is a tension within the theory of autopoiesis between the notions of self-production and the closure of the system with the coupling of the system to its environment (Vanderstraeten, 2005). The autopoietic system is neither determined by its environment nor its internal operations alone – it is a product of the interaction of the two. Maturana and Varela (1987) refer to this relationship of mutual influence as structural coupling thus:

*The structure of the environment only triggers structural changes in the autopoietic unities (it does not specify or direct them), and vice versa for the environment. The result will be a history of mutual congruent structural changes [...] there will be a structural coupling.*

The notion of structural coupling represents an important point of departure from the traditional open systems view that regards systems as being environmentally determined and stresses the importance of boundary between the living system and its environment. The tendency for autopoietic systems to look after their own interests and self-preservation comes with certain warnings. For example, Robb (1989, p.348) warns of:

*The subordination of all human aspirations and ambitions, values, and welfare to the service of preserving the unity of such systems, and not to any human end. Once formed such organizations appear to be beyond human control; indeed to be real-world systems*

Corporations that span the globe seem unconscious of the local context in which they operate except those to their advantage (Klein, 2000). Globalization would represent opportunities but also threats to the self-reproduction of autopoietic systems. Opportunities to operate in
new markets and to take advantage of low cost production possibilities may be accepted; but there may be scant regard for national regulatory regimes. The lack of attention to regulatory schemes has been manifest in various industries, most notably and recently, the banking and finance industry. Finance companies have demonstrated that the pursuit of autonomous self-reproduction can produce disastrous consequences for the wider social and economic environment.

The interests of firms may often put ahead of costs to the physical or social environment, which is the condition referred to by Gregory (2006, p.962) as ‘pathologically autopoietic’. The biological view as explained below may exclude ethics from consideration. The biological view is an a-moral view of life and organizational change. It is akin to Nietzsche’s claim that life is driven forward by an inhuman principle of creation that is immanent or interior to life. Nietzsche referred to this drive as ‘will to power’ (Spinks, 2003). Spinks (ibid, p.5) explains that ‘will to power’ is an inhuman principle because it envisages all life, not just human life, as united by a common striving of becoming and transformation within which each form of life seeks to expand and increase its power. The aim of life from this perspective is not enlightenment, moral improvement or even self-preservation; it seeks ‘power’. By this is meant that a particular form of life becomes powerful in so far as it appropriates other forces to its domain. As in the theory of autopoiesis, every movement of life bears within it a configuration of self-referential forces. The struggle between powers produces a hierarchy of stronger and weaker forces, which then leads to the creation of accepted thinking or concepts. According to Spinks (ibid, p.5), Nietzsche argued what we call ‘values’ describe the domination of a particular perspective upon or interpretation of life. According to the biological understanding, there is no human consciousness that can prevent the competition of forces. Thus Robb, in the above quotation, refers to ‘real world systems’ beyond human control.

**Real organisations or social constructs**

The question is: are organisations “real” in this biological sense, with a DNA programmed for self-preservation only. Decision makers in autopoietic organisations could be characterised as having an exclusive focus (fixation) on the existence of their organisation, irrespective of social and environmental considerations and leaving their personal ethics at the door (Brocklesby, 2009). An alternative view is that organisations are social constructs whose core decision structures can be changed by human values and aspirations. It may be possible that organisational strategic decision making can become interpenetrated with personal values of decision makers (Rempel, 2005).

Is it purely coincidental that CSR (corporate social responsibility) is an acronym of SCR (social construction of reality)? Surely not! If we view the theory of autopoiesis as simply a metaphor, rather than a theory of the real, it may be possible for human agency to change the reality. But how? And what connects the two in the so-called ‘real world’? Is it accounting?
Could developments in accounting structure organisational time and space to expand the boundaries into new fields of social responsibility?

The argument in this paper is that accounting systems are not, as often portrayed, neutral collectors of objective information as an input to rational economic decision making. They are rather a part of the evolution of the organisation, creating the environment (medium) in which the organization changes. In a theory of autopoiesis, accounting practices may be viewed as component parts of the system that (re)produces itself; and as creators of the organization’s boundary and identity. Perhaps the simplest way of understanding the perspective is to return to the classic paper by Ruth Hines about the nature of accounting in which she argued: “in communicating reality, we construct reality” (Hines, 1988, p.251). The external environment does not determine accounting practice, but rather accounting practice determines the environment. What elements of the environment are counted as part of the organization, and which parts of the environment are not included in the organization, depends on the application of accounting practice. In her illustration, a river that passes through the organization’s physical boundary, and whose waters the organization uses, is not treated as part of the organization (ibid, p.251). Accounting creates the fictive entity called an ‘organization’ and its boundaries. There is no physical ‘reality’. 

What we consider to be ‘objective’, what we consider to be ‘rational’, the way we think, the way we act, our theories, the way our society is structured – it’s not real…If men define things as real, they are real in their consequences. We create a picture of an organization, or ‘economy’, whatever you like, and on the basis of that picture (not some underlying ‘real’ reality of which no one is aware) people think and act. And by responding to that picture of reality, they make it so: it becomes real in its consequences. (Hines, 1988, p.257)

This view from Ruth Hines reflects the way information systems in autopoietic organizations operate. To understand organizational change it is necessary to understand the inner workings of the information and communication systems in the organization, and not look to external environmental influences. Autopoietic organizations exist for their own sake; their purpose is their own dynamic production. Relations with the ‘environment’ are self-referential and self-interested.

The tragic consequence of traditional accounting systems is that they exclude considerations of the environment and do not provide appropriate signals for decisions relating to anything other than capital accretion. Social and environmental consequences of decisions are ignored. Traditional accounting systems have drawn strict boundaries around the accounting entity allowing no intrusion of interactions and transactions other than financial. Indeed, accounting itself could be viewed as an autopoietic system, closed and self-referential. Its only concern is its own preservation. Is change a possibility?

There are increasing external pressures for change.
The recently released Kings 3 Report from the South African Institute of Directors on corporate governance promotes the total integration of social and environmental considerations into the core of the firm’s response mechanisms:

*Sustainability is now the primary moral and economic imperative and it is one of the most important sources of both opportunities and risks for businesses. Nature, society, and business are interconnected in complex ways that need to be understood by decision makers. Incremental changes towards sustainability are not sufficient – we need a fundamental shift in the way companies and directors act and organise themselves.*

(http://www.pwc.com/za/en/king3)

The Report promotes the concept of ‘integrated accounting’, and the institutionalisation and internalisation of social values in profit seeking business firms. Signals concerning social and environmental well-being, as stated earlier, may be picked up by organisations if they are both socially acceptable and in the system’s interest.

Below some empirical results from a NZ survey of ‘sustainability’ practices and motivations for such practices which may throw some light on the possibility of personal values interpenetrating organisational processes, and broadening accountability beyond a fixation on financial results.

**SBN survey of ‘sustainability practices**

The Sustainable Business Network (SBN) is a NZ based network of over 400 members, mostly SMEs, and is a nationally based forum for businesses interested in sustainable development practices. Formed in 2002, SBN provides members with tools and seminars on sustainability practices, collects best practice case studies and confers annual sustainability awards. SBN sponsored a survey of ‘sustainability’ practices among members of SBN. They wanted to know the extent of such practices among their members and to compare the results with non-members.

A survey was conducted in 2003 of all members of SBN and a matched sample (size, location) of non-members. The survey was intentionally simple. The terms such as ‘sustainability’ or ‘corporate social responsibility’ were avoided. Instead participants were asked direct questions about practices – “Do you have targets for energy/waste reduction?” “Do you have a recycling programme?” “Do you report against targets”, and so on. We also covered drivers and barriers to such practices. The survey was repeated in 2006 and again in 2009/10. In the latest survey 726 respondents provided information.

No apparent differences were apparent between members of SBN and non-members in the 2003 and 2006 surveys. But then a bifurcation became evident in the latest survey conducted in 2009/10. The latest survey captured what happened to sustainability practices during one of the worst global economic recessions in recent history. While members of SBN maintained
or increased their practices, non-member firms dropped them in the economic downturn. The result was a divide between the two groups. Table 1 illustrates the statistically different results for firms affiliated to SBN and the group not affiliated.

Table 1 – Business Engagement in Environmental Activities by Affiliation

<table>
<thead>
<tr>
<th>Business engages in the following activities related to the environment:</th>
<th>Affiliated N=350</th>
<th>Non-Affiliated N=402</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a recycling programme</td>
<td>87%</td>
<td>70%</td>
<td>5.436***</td>
</tr>
<tr>
<td>Has a company environmental policy statement</td>
<td>54%</td>
<td>24%</td>
<td>8.919***</td>
</tr>
<tr>
<td>Produces a public environmental and/or sustainability report</td>
<td>23%</td>
<td>6%</td>
<td>6.935***</td>
</tr>
<tr>
<td>Considers the environmental impact of our products, processes and/or services</td>
<td>84%</td>
<td>47%</td>
<td>11.341***</td>
</tr>
<tr>
<td>Develops product and service innovations based on environmental benefits</td>
<td>52%</td>
<td>17%</td>
<td>11.061***</td>
</tr>
<tr>
<td>Marketing or image based on environmental claims (e.g. clean, green N.Z)</td>
<td>47%</td>
<td>14%</td>
<td>10.602***</td>
</tr>
<tr>
<td>Measurable targets for employee training programs related to our environmental goals</td>
<td>15%</td>
<td>5%</td>
<td>4.358***</td>
</tr>
<tr>
<td>Measurable targets for reducing waste</td>
<td>39%</td>
<td>18%</td>
<td>6.310***</td>
</tr>
<tr>
<td>Measurable targets for reducing energy</td>
<td>35%</td>
<td>17%</td>
<td>5.662***</td>
</tr>
<tr>
<td>Measurable targets for reducing water</td>
<td>21%</td>
<td>12%</td>
<td>3.242**</td>
</tr>
<tr>
<td>Measurable targets for reducing carbon</td>
<td>27%</td>
<td>6%</td>
<td>7.826***</td>
</tr>
<tr>
<td>Participates in a voluntary environmental program</td>
<td>46%</td>
<td>19%</td>
<td>8.233***</td>
</tr>
<tr>
<td>Has an environment-focused supplier program</td>
<td>39%</td>
<td>11%</td>
<td>9.453***</td>
</tr>
<tr>
<td>Has environmental management systems</td>
<td>33%</td>
<td>13%</td>
<td>6.448***</td>
</tr>
<tr>
<td>None</td>
<td>1%</td>
<td>14%</td>
<td>-6.928***</td>
</tr>
</tbody>
</table>

*p< .05, **p< .01, ***p< .001. All test are single-tailed.

The same divide was apparent in relation to social practices. Overall, New Zealand organisations that are affiliated with sustainability networks are significantly more likely to engage in ALL socially-related activities compared to organisations that are not affiliated. Overall, only one per cent of affiliated firms engage in no socially-related activities compared with 11% of non-affiliated organisations. T-Test results are shown in the Table 2 below.
Table 2: Business Engagement In Socially-Related Activities By Affiliation/Membership

<table>
<thead>
<tr>
<th>Business engages in the following socially-related activities:</th>
<th>Affiliated N=350</th>
<th>Non-Affiliated N=402</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides job training</td>
<td>62%</td>
<td>50%</td>
<td>3.104**</td>
</tr>
<tr>
<td>Provides assistance for employees to obtain tertiary education</td>
<td>38%</td>
<td>25%</td>
<td>3.674***</td>
</tr>
<tr>
<td>Gives time, money, products or services to local community projects</td>
<td>74%</td>
<td>44%</td>
<td>8.608***</td>
</tr>
<tr>
<td>Contributes time, money, products or services to charity</td>
<td>69%</td>
<td>55%</td>
<td>4.177***</td>
</tr>
<tr>
<td>Considers diversity in hiring decisions</td>
<td>45%</td>
<td>21%</td>
<td>7.247***</td>
</tr>
<tr>
<td>Has family-friendly policies</td>
<td>69%</td>
<td>52%</td>
<td>4.841***</td>
</tr>
<tr>
<td>Has stress management initiatives</td>
<td>44%</td>
<td>23%</td>
<td>6.477***</td>
</tr>
<tr>
<td>Has ethical purchasing policies</td>
<td>51%</td>
<td>26%</td>
<td>7.380***</td>
</tr>
<tr>
<td>Measures outcomes/impacts of socially-related initiatives</td>
<td>22%</td>
<td>7%</td>
<td>6.069***</td>
</tr>
<tr>
<td>Develops product and service innovations based on social benefits</td>
<td>33%</td>
<td>10%</td>
<td>8.357***</td>
</tr>
<tr>
<td>None</td>
<td>1%</td>
<td>11%</td>
<td>-5.591***</td>
</tr>
</tbody>
</table>

Institutional pressures

Overall, New Zealand organisations that are affiliated to sustainability networks are significantly more likely to feel internal and external pressures toward engaging in socially-related activities compared to organisations that are not affiliated. The overwhelming influence on whether organisations engage in social and environmental practices is the values and beliefs of senior management followed by those of employees (see Table 3 below).

In handwritten additions on the questionnaires and in follow-up interviews, managers stated ethical positions – “It’s the right thing to do”; “It’s just what we do”; “Sustainability is not a bolt-on thing, but it’s something that is interwoven into the DNA of the business – directions, needs and actions”. (Interview, B.Law, consultant to Otago Polytechnic, July, 2011)
Table 3: Institutional Pressures Toward Socially-Related Activities By Affiliation

<table>
<thead>
<tr>
<th>My business is getting internal pressure to improve socially-related activities from...</th>
<th>Affiliated N=350</th>
<th>Non-Affiliated N=402</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent company</td>
<td>3%</td>
<td>2%</td>
<td>1.471</td>
</tr>
<tr>
<td>Shareholders</td>
<td>7%</td>
<td>3%</td>
<td>2.596**</td>
</tr>
<tr>
<td>Employees</td>
<td>25%</td>
<td>9%</td>
<td>6.105***</td>
</tr>
<tr>
<td>Personal values, beliefs and/or commitments of management</td>
<td>41%</td>
<td>17%</td>
<td>7.636***</td>
</tr>
<tr>
<td>No one</td>
<td>41%</td>
<td>66%</td>
<td>-7.339***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>My business is getting external pressure to improve socially-related activities from...</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customers</td>
<td>16%</td>
<td>8%</td>
<td>3.570***</td>
</tr>
<tr>
<td>Competitors</td>
<td>7%</td>
<td>2%</td>
<td>2.889**</td>
</tr>
<tr>
<td>Government</td>
<td>4%</td>
<td>3%</td>
<td>.956</td>
</tr>
<tr>
<td>Pressure groups</td>
<td>4%</td>
<td>3%</td>
<td>.956</td>
</tr>
<tr>
<td>No one</td>
<td>7%</td>
<td>11%</td>
<td>-1.868*</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001. All test are single-tailed.

We theorise from our survey that many firms revert to their core identity and to biological autopoietic self-reproduction, self-preservation mode as soon as economic conditions deteriorate. These firms may respond superficially to signals about sustainability and adopt practices as a ‘nice’ extra in good times. But the practices do not penetrate their core being. They are part of the structure that can be dropped without affecting the identity of the entity. They are add-ons that can be discarded when economic conditions tighten. On the other hand, there are firms that have internalised and institutionalised social and environmental concerns so that decision structures are a part of their DNA. They continue to practice socially responsible and environmentally friendly practices because they view organisational survival in terms of a bigger system - a system of relationships in which its own long-term survival is interconnected with communities and ecological well-being.

Implications for accounting
The theory of autopoiesis raises difficult questions for accounting. This section reflects on various understandings of ‘accounting’. It raises questions and speculations about its employment within living systems such as organizations. Some issues, which were very evident in earlier literature, relate to the differences between formal and informal knowledge gathering and processing activities within organizations.

Preston (1986) under the title: *Interactions and arrangements in the process of informing*, described how the formal information systems in an organization are not the source of information for day-to-day actions and interactions. On a similar theme, Boland (1983) explained that as well as ‘rational’ systems, organizations operated with ‘natural’ systems. Roberts and Scapens (1985) differentiated between ‘accounting systems’ and ‘systems of accountability”, the former being the potential offered by accounting systems and the latter the actual use of those potentialities in everyday organizational life. All these researchers have indicated that the formal rational models informing the design of accounting and information systems do not capture the reality of day-to-day organizational functioning.

Contrary to the prophecies of open systems theory, accounting systems may not adapt to environmental influences. The basis of contingency theory is that organizations are open to their environments and accounting systems must adapt to environmental influences to ensure organizational survival. Yet evidence suggests that when organizations change, the accounting systems do not necessarily change; they often continue the same (Kaplan 1998). Specific examples of lack of response of accounting systems to organizational change have been reported by Huysma, von der Blonk and Spoor (in Magalhaes and Sanchez, p.205) where a state-owned enterprise was privatized to commercial business, yet despite the massive changes in organizational context, the financial information system continued to be used unchanged. Internal factors may be more important than environmental contexts in determining the use of accounting.

The unchanging nature of information systems is reflected in Institutional Theory (IT). IT is a more conventional view of organisational functioning that has similarities to autopoiesis. DiMaggio & Powell (1983, 1991) point out that organizations tend to model themselves after other similar organizations which have been found to manifest significant higher survival advantages. Institutional theory draws on a definition from the social science literature which defines institutions as “a way of thought or action of some prevalence and permanence, which is embedded in the habits of a group or the customs of a people” (Hamilton 1932:84). Institutions are settled ways of thinking common to members of an organization (Burns 2000). Institutional principles are encoded in rules and routines which in turn are enacted in specific situations (Johnson et al, 2000). The resulting behaviour is reproduced by organizational members and becomes objectified and institutionalised.

Institutional theorists sportray accounting as a set of rules and routines that become ingrained or habitualised in organisations. They are a force for stability. The use of Institutional Theory applied to accounting has been popularized by Burns and Scapens (2000). In this perspective, accounting is not simply a technical device applied neutrally to assist
management with decision making but is the product of a particular organizational culture which in turn is embedded in and influenced by a broader set of institutional arrangements.

So accounting practice is seen as a phenomenon subject to the influence of both the particular organizational culture and the wider social and institutional context in which it functions (Hopwood 1983, Brignell and Modell, 2000; Hoque and Alam 1999; Hoque and Hopper 1997). Management control practices are often institutionalized to gain legitimacy from external constituents like the government (Modell 2001; Collier 2001, Carpenter and Feroz, 2001). Studies of legitimacy tend to focus on explaining isomorphism, that is similarity, in accounting rules and routines which become accepted unquestioningly by organizational participants. Explanations of change often involve the introduction of some external ‘jolt’ or crisis that forces change (perturbations in autopoistic theory). Both Barley & Tolbert (1997) and Burns & Scapens (2000) acknowledge that there needs to be an exogenous shock before actors can make collective choice to change institutional arrangements. As Giddens (1991) explains, in a crisis situation system reproduction can give way to abrupt change as agency comes to the fore. Existing power structures (structures of domination) are challenged and replaced with new structures.

Such a jolt has come in the form of societal demands for corporate social responsibility (CSR). The organisation has to structurally couple with other environmental structures. If these are changing, so might the structural features and decision making processes in the organisation. If accounting is a part of CSR (social construction of reality) it can change the organisation’s reality to stay relevant to society’s needs and to ensure its continuing survival. More and more signals are appearing to this effect. The question is whether the signals are strong enough to disturb the self-referential nature of closed systems.

The internal information collecting and processing systems of the organisation have important effects on what signals are received (Scott,1981, p.173). Organisations scan the environment and information processing facilities determine the organisation’s perceived environment to which it relates. Accountants can affect the understanding of what to attend to and how to interpret the environment. Most accounting emphasises the monetary impact of external transactions with the environment and these gain dominance, possibly at the expense of social and environmental factors. If this is the case, accountants are encouraging autopoietic processes. The role of accountants in the move towards CSR has not been a standout feature. Reporting on and accounting for sustainability issues are not driven by accountants. They may be missing a big opportunity to become part of value-based, ethical senior management teams. Increasingly, directors of companies are required to report on social and environmental impacts (UK Companies Act, 2006). Accountants could play a key role. Some firms are more proactive and the argument presented in this paper is that the structural coupling that organisations make with their environments affects their long term survival. Some business organisations are more open than others to environmental factors. We have noted a growing divide in this autopoietic response. Some organisations have a value-driven culture that is less susceptible to short term variations. The frightening fact is that only a small number of organisations in NZ are affiliated to the sustainable business
networks. The vast majority may engage in self-referential re-production of the capitalist model, and be ‘pathologically autopoietic’. This does not augur well for the future.

**Conclusion**

It is somewhat disconcerting to have one’s ideas challenged. A disturbing aspect of the theory of autopoiesis is the view that accounting (and other information systems) are not tools used to collect information about the environment, process this information and make a rational response. It may seem that way from the outside, but on the inside that is not what happens. After thirty and more years of research into the functioning of accounting in organizations, we are still lacking knowledge about the role of accounting in dynamic systems or organizational change. New research approaches may be necessary and autopoiesis is one that offers the possibility of new understandings.

The autopoietic view of organizations was compared to open systems view. In the open systems approach, organizations and their environments are in equilibrium as organizations respond to environmental necessities. Accounting systems assist in the necessary adaptation informing managers of how to respond in order to survive. Organizations are a part of their environment in the ‘open’ systemic view. This approach was contrasted with an alternative – that of the closed, or autopoietic system. Here the organization is an embedded, but differentiated, form of social life. The organization is embedded in society in its use of information about its ‘medium’ or environment but, at the same time, the organization is differentiated from society by managing its boundaries to maintain its own internal identity. The problem with autopoietic systems is their tendency to place their own survival above that of social and environmental considerations. There is a danger they will deplete the environment and damage society in the pursuit of their own self-reproduction. If the theory of autopoiesis is understood simply as a metaphor, and not a factual depiction of reality, then it is possible to use this understanding to avert potential danger, and to introduce humanising influences to organisational life. If the theory is understood as a real description and explanation of self-serving life forces, the future may be grim.

A pessimistic view is that sustainability of human and other forms of life has already been placed in jeopardy. There are no mechanisms to prevent organizations being ‘pathologically autopoietic’. We do have evidence of some SMEs in NZ that have a value-driven culture that is less susceptible to purely capitalistic forces, but they may be well in the minority. We need to philosophise about accounting, urgently.
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