Postcards from the Edge: A Review of the Business and Environment Literature

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ERIM REPORT SERIES *RESEARCH IN MANAGEMENT*	
ERIM Report Series reference number	ERS-2007-085-ORG
Publication	December 2007
Number of pages	60
Persistent paper URL	http://hdl.handle.net/1765/10771
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Bibliographic data and classifications of all the ERIM reports are also available on the ERIM website: www.erim.eur.nl

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ABSTRACT AND KEYWORDS	
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Free Keywords	environmental issues, business and environment, competitive advantage
Availability	
Classifications	

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Abstract. Environmental issues, while of growing interest, have been outside the main focus of business scholarship. This position on the periphery may have been a good thing. It allowed scholars of business and the environment to consider unusual theories and evaluate overlooked phenomenon. In doing so, they created a body of research that provides new insights on two topics of mainstream interest -- the sources of competitive advantage and the origin and function of self-regulatory institutions.

POSTCARDS FROM THE EDGE:

A REVIEW OF THE BUSINESS AND ENVIRONMENT LITERATURE

In the last 20 years, a research agenda has emerged that is often termed "business and the environment". It has been advanced by special issues in several leading management journals and now represents a growing part of the management literature. Yet, the boundaries of this research agenda, and even the definition of its central term, remain unclear. Once "environment" might have been understood as "nature", but scholars have come to realize that this definition is overly narrow and possibly meaningless. Natural systems have been bound up with human activity for so long that there is little left of any primordial nature. In current usage, the "environment" can represent everything from the health of the community to the appearance of a neighbor's yard.

The meaning of "environment", as used by many of the scholars reviewed in this article, can best be understood through its connection to the economic concept of "externality". In classic economic analysis, costs and benefits accrue to the transacting parties – or they spillover as "externalities" to unconsidered others. As a result, the effect of economic activity can be divided into "internalities" and "externalities" – into "business" and "environment".

By definition then, the "business and environment" (B&E) literature should be of little interest to business academics. The purpose of business is to maximize internal returns, and the role of business scholars is to understand how they do so. Government, not business, has the

responsibility of correcting the problems caused by "externalities". Thus, people interested in "the environment" should be in schools of government or public policy.

As you might guess, we will argue that this perspective is wrong. What you may not expect, is that we will do so for different reasons than most previous authors. We will not argue that "the environment" appears to be in such a terrible way that it behooves every scholar to consider ways it can be protected (though this may indeed be true). Instead, we will argue that the business and environment literature is important because it can provide new insights on topics that are of interest to most business scholars.

The business and environment literature provides these insights, ironically enough, precisely because it has been peripheral to the mainstream management literature. This position encouraged its scholars to consider "unusual" problems, "implausible" explanations, and "unimportant" data. This freedom has allowed the literature to peer into some of the dark corners of management theory. Unfortunately, it also has allowed B&E scholarship to disperse so widely that it is not possible for us to review it all. To manage this diversity, we have chosen to limit our review to just two areas, and send quick overviews – academic postcards if you will – that provide a sense of the research being conducted by business and environment scholars. For our postcards, we have chosen the research being conducted on two questions: 1) can firms compete more successfully by protecting the environment, and 2) can firms create a competition where protecting the environment leads to success?

Research on the first question, which we will call the "Pays-to-be-Green" literature, grew out of natural experiments caused by increased environmental regulation. According to accepted economic theory, regulation should hurt firms, because it increases costs and constrains the choices available to managers. Yet, in the early 1990s anecdotal evidence began to appear that

suggested that some regulations provided unexpected benefits and revealed that some firms even chose voluntarily to go "beyond compliance". Why would they do this? Are such benefits sustainable? What are the implications for theory? In our first postcard review, we will consider how scholars have attempted to answer these questions.

Research on the second question arose from observation that firms sometimes assume the role of government and attempt to self-regulate environmental problems. Institutions for supporting such self-regulation have become visible and important. These new institutions are neither markets, nor hierarchies, nor public norms of behavior. What is their function? What causes them to arise? When do they work effectively? In our second postcard, we will consider emerging scholarship that attempts to answer these questions.

Each of our two sections can be considered independently. You are welcome to consider both or one. In our conclusion, we will bring the two literatures together and argue that they share some common approaches and themes. We will discuss some limitations on generalization from B&E scholarship, and also consider implications for future investigation.

POSTCARD 1: PAYS TO BE GREEN

A postcard length synopsis of the "pays-to-be-green" (PTBG) literature might read: "scholars investigate the proposal that firms profit by further protecting the environment". With a bit more space, we might also note that it is remarkable that serious scholars are even willing to consider such an implausible claim. According to mainstream economic theory, there are two strikes against the idea: firms gain little by providing public goods (e.g. clean water or air), and

market pressure should drive firms to make profit-maximizing choices about when and how much to provide.

The PTBG literature began to take shape in the early 90s when stories began to emerge that regulation had spurred some companies to uncover cost saving measures (Berube, Nash, Maxwell, & Ehrenfeld, 1992). According to these reports, these innovations would have benefited the company even had the regulation never been promulgated (Repetto, 1995; U.S. Congress. Office of Technology Assessment, 1994). As it was, they partially or fully offset the cost of complying with the regulation.

Such reports might have been dismissed and ignored, were it not for their endorsement by two notable authorities. In a path breaking article, Michael Porter and Claus van der Linde (1995) proposed that "*by stimulating innovation, strict environmental regulations can actually enhance competitiveness*" and thereby "*partially or more than fully offset the costs*" of compliance (Porter & Van der Linde, 1995:98). Known as the "Porter Hypothesis" (PH), this claim stimulated and organized research in the field.

The Porter Hypothesis includes two provocative elements. First, it assumes that firms are missing opportunities to make money. More critically, they are doing so in a <u>systematic</u> way (Palmer, Oates, & Portney, 1995). Firms miss profit opportunities, Porter and van der Linde reason, by using too many environmental resources or by ignoring ways to reduce the firm's consumption. Such choices are bad both for public welfare and for the firm. Social returns are a byproduct, not a motive force in the Porter Hypothesis.

The second provocative claim is that external stakeholders can provide information or incentives that will improve the efficiency of most firms. In the words of Porter and van der Linde (1995:127): "*the belief that companies will pick up on profitable opportunities without a*

regulatory push makes a false assumption about competitive reality -- namely, that all profitable opportunities for innovation have already been discovered, that all managers have perfect information about them, and that organizational incentives are aligned with innovating."

The notion that it might "Pay to be Green" attracted further attention when scholars linked it to the Resource Based View (RBV) (Hart, 1995; Rugman & Verbeke, 1998). Where the Porter Hypothesis is a theory of how environmental performance helps industries or nations gain competitive advantage, the Natural Resource Based View (NRBV) is a theory of how an individual firm might gain a competitive advantage by going green. The typical RBV proceeds as follows: prior to investing (*ex-ante*) in resources, managers make varying estimations of their future value. As a result of these varying estimations, firms make differing investments in resources. After investing (*ex-post*), factor immobility and barriers to competition from substitute products or services prevent those that made inferior decisions from adjusting, and thus some firms gain a sustainable competitive advantage (Barney, 1991; Peteraf, 1993). As an addition to the RBV, the NRBV focuses on those resources that will allow the firm to manufacture environmentally friendly products or generate fewer harmful byproducts.

The NRBV differs also from classic RBV analysis by borrowing two ideas from the Porter Hypothesis. First, it assumes that managers not only make heterogeneous investments in resources, but in the case of resources needed to protect the environment, they systematically invest too little (McWilliams & Siegel, 2001). Like the Porter Hypothesis, it thus assumes that an average firm can achieve a competitive advantage by improving its environmental performance. Second, the NRBV differs from the RBV by arguing (like the PH) that external actors can be instrumental in stimulating firms to achieve superior performance. The NRBV

emphasizes different agents as sources of stimuli for change and has tended to explore the role played by non-governmental stakeholders rather than government regulation.

Contributions of the PTBG Literature

The provocative claims made in both the Porter Hypothesis and the NRBV are hotly debated. In particular, scholars have evaluated 1) the assumption that managers systematically miss profit opportunities, and 2) the expectation that external actors can stimulate firms to superior financial performance. In doing so, they have extended existing theories of the source of competitive advantage.

Investigation of the first claim has focused attention on an ambiguity in existing RBV theory (Denrell, Fang, & Winter, 2003). As formulated by Barney and Arikan (2001), the RBV theory assumes that *ex-ante* expectations differ; but it does not assume that managers make *systematic* errors (e.g. repeatedly invest too little in a particular type of resource). Other strands, however, are more open to the potential for systematic error. For example, Denrell et al. (2003) suggest that prices for some resources are systematically suppressed by ignorance of "untried activities".

Investigation of the second claim provides an opportunity to consider a topic that has been relatively neglected in the standard RBV literature – the role of external actors in stimulating comparative advantage. Although there are both theoretical and empirical reasons to believe that regulation and stakeholders could play an important role in spurring innovation that leads to competitive advantage, the literature on the issue remains slight.

In the section below, we discuss research on these two claims. We first consider theories and evidence for systematically overlooked profit opportunities. We then consider research on the role of exogenous actors in spurring competitive advantage.

Systematically overlooked opportunities

Many scholars do not look kindly on claims that decision-makers overlook profit opportunities, and any such claim must be justified both theoretically and empirically (Walley & Whitehead, 1994). Over the last ten years, scholars in the PTBG literature have attempted to piece together such an explanation, and while it remains inchoate, its general shape now can be discerned. In brief, scholars argue that the difficulty of evaluating the value (and cost) of environmental performance weakens the force of objective analysis and encourages managers to resort to rules of thumb. Biases in these heuristics then cause some types of profit opportunities to be overlooked systematically. Below, we first discuss explanations for why valuing environmental performance might be especially difficult, and then review research some biases that might explain overlooked opportunities to profitably improve environmental performance.

Valuation Difficulties. Scholars make three arguments for why environmental performance is particularly hard to value. First, market prices usually do not exist for environmental goods and services (Reinhardt, 2000). Lacking price information (and all that is embedded in it), managers must perform their own analyses to estimate the value of

environmental performance.[1] For example, they may need to estimate how improvements in performance will reduce the threat of lawsuits or regulatory pressure. Such estimates are highly uncertain and contain attributions regarding the potential behavior of regulators, activist groups, and other actors.

Second, managers may receive incomplete or biased information about the cost of environmental performance because agents with such information may not have a clear incentive to communicate it. Since many aspects of environmental performance – such as the prevention of oil spills or chemical accidents – are particularly difficult to observe or monitor (Reinhardt, 2000), it is often very difficult to design effective incentive systems to encourage agents to engage in environmental improvements. Given the lack of such systems, agents may even have an incentive to misreport both their activities and the cost of these activities (Ambec & Barla, 2002). Such distortion could mean that decision-makers use inaccurate information in making investment decisions.

Third, organizational structures may impede the flow of information about ways to profit by improving environmental performance (DeCanio & Watkins, 1998). Most existing organizations were created when environmental resources were thought to have little value. As a result, organizations are often staffed and structured to gather and transfer information about other factors, but not for environmental ones (Cebon, 1992).

Testing the above relationships empirically has proven difficult. Many scholars have investigated whether organizations with better information gathering abilities are more likely to identify ways to profit from improved environmental performance. Many of these studies draw inspiration from classic theories of organizational design (Galbraith, 1973; Thompson, 1967),

[1] To facilitate exposition, we will use "environmental performance" to refer to the degree to which firms harm or help the environment.

and more recent theories based on “Lean Production” (Womack, Jones, & Roos, 1991). For example, Cebon (1992) and Ashford and Heaton (1983) find case evidence that the creation of specialized environmental departments can act to “buffer” the organization from new demands and thus restrict information flow about possible improvements. Klassen and Whybark (1999) use surveys from 83 firms to investigate the effect of investment in end-of-pipe buffers (e.g. pollution control equipment). They find investments in end-of-pipe controls are associated with lower performance, while investments in pollution prevention are associated with better manufacturing performance.

Later research reinterpreted the effect of dedicated environmental departments and pollution control equipment and argued that they could act as potential sources of information. King (1995; 1999) and Rothenberg (2003) find that specialized environmental units and operators of waste-treatment equipment often discover or transfer information about profitable, but unrealized, waste reduction opportunities. Melnyk et al. (2003a) report that specialized structures and personnel, such as formal environmental management systems, allow managers to gain information about impacts well beyond pollution abatement and bring real benefits on many aspects of operation performance (Melnyk, Sroufe, & Calantone, 2003a). Florida and Davinson (2001) find firms adopting environmental management systems were able to gather more accurate information on their activities with the result to reduce environmental risks for the community.

A particularly fruitful avenue for empirical research on the role of organizational structure in unleashing unrealized profit opportunities investigates parallels between “lean production” and “green” production. Theories of lean production suggest that by limiting inventory stocks (and other types of buffers) in production, managers can expose production problems and change

agent incentives. Evidence on lean production, suggests that until recently, managers have tended to systematically invest too much in inventory (or too little in inventory reduction) (Macduffie, 1995). Noting parallels between lean production and green production ideas, PTBG scholars have argued that 1) the use of lean production may inform managers of the value of waste reduction efforts (Klassen, 2000), or 2) that the idea of reduced inventory can be extended to cover the buffing processes of waste treatment. Consistent with this idea, Rothenberg et al. (2001) find that the use of lean production reveals ways to minimize waste and make better use of production inputs. Klassen (2000) reports that "quality-related organizational systems" were associated with greater investment in pollution prevention and recycling. Pil and Rothenberg (2003) find that environmental and manufacturing improvement efforts are "synergistic and reciprocal". King and Lenox (2001) also find evidence that adoption of lean production is related to environmental performance improvement.

While the above studies suggest that difference in organizational or operational designs influence the transfer of valuable information and the discovery of profit opportunities, they cannot rule out unobserved firm differences as a possible explanation of observed behavior. To control for fixed organizational characteristics, Lenox and King (2004) use panel data to investigate behavior before and after the creation of corporate environmental "information provision" offices. They find that the creation of such offices anticipates adoption of environmentally beneficial practices. Yet, their study cannot distinguish the effect of information from potentially confounding changes in incentives.

Cognitive Heuristics and Biases. The difficulties managers face in determining the value of environmental performance (described above) do not provide a complete theory of why managers might overlook opportunities to increase profits while protecting the environment.

Managers with unconstrained reasoning power should be able to anticipate the potential for missing or biased information and adjust their decisions accordingly. Practically, however, the difficulties make it less likely managers can use "hard" numbers in making decisions and more likely they will rely on intuition or rules of thumb. It is these heuristics, PTBG scholars argue, that cause managers to miss win-win opportunities to improve both environmental and financial performance.

Scholars suggest that there are several sources of bias in decision-making that explain systematic underinvestment in environmental resources (Kleindorfer, 1999). In concert with the previous section, scholars argue that the availability of information about the value of environmental performance influences the degree of investment. Since, as discussed above, managers often lack accurate information about environmental costs and benefits, an "availability bias" could cause managers to discount excessively the value of investments in environmental resources (Kleindorfer, 1999; Tversky & Kahneman, 1973).

Other scholars note that other known cognitive biases may reduce investment in environmental resources. Bazerman and Hoffman (1999) suggest that individuals tend to use irrationally high discount rates and argue that such a bias would suppress investment in factors that provide deferred returns – a case that is common for environmental performance. Hoffman et al. (1999) argue that biased decisions result from a tendency of managers to view environmental and financial performance as a "fixed pie" in which gain on one dimension necessitates loss on an other. Finally, Mylonadis (1993) argues that commonly used metaphors can influence the framing of problems and so influence investment. Both Mylonadis (1993) and Hoffman (1999) use case studies to test their claim, and both find evidence that framing

environmental performance as problem of “disposal” or “waste treatment” tended to distract managers from the potential strategic and financial value of environmental performance.

Tenbrunsel et al. (2000) argue that certain types of regulation may trigger damaging heuristics and biases. They argue that the existence of a government standard acts as an anchoring mechanism for decision-making. Even if the standard is not required or enforced, the mere existence of a “standard” causes people to perceive conforming solutions as more desirable than non-conforming ones (Tenbrunsel et al., 2000). Employing an experimental research design, they find that subjects give greater value to a particular option, when it is presented as a “standard”. They infer that framing something as a “standard” causes “*cognitive distortions”* which increase *“the attractiveness of standard-conforming solutions over that of nonconforming solutions*”(Tenbrunsel et al., 2000: 854).

Finally, Kunreuther and Pauly (2004) argue that people often underestimate the cost of rare events. For this reason, they argue, people fail to buy the optimal mount of insurance against natural disasters such as earthquakes, hurricanes, and so on. Kunreuther and Bowman (1997) and Kleindorfer and Saad (2005) argue that similar difficulties in evaluating rare events like chemical accidents and spills could cause managers to systematically under-invest in prevention of such accidents.

The role of exogenous actors in creating sustainable advantage.

The second claim of the Porter Hypothesis and NRBV theory -- that external actors can stimulate firms to superior financial performance – has received almost as much attention as the notion that managers might systematically overlook profit opportunities (discussed above).

Scholars have long agreed that government and stakeholders can affect the value of environmental goods and services. What is much more controversial is the possibility that external actors might be able to foster better decision-making, and thereby cause managers to uncover hidden value. Research on this possibility has emphasized the role of government or stakeholders, and we will subdivide our review accordingly.

Government stimuli. A prominent argument for a possible beneficial effect of government stimuli is that government can facilitate the flow of information to decision-makers. If, as discussed in the previous section, a lack of information causes managers to overlook profit opportunities, government may be able to encourage improvement by publicizing information about the costs and benefits of certain activities. Government programs like "Green Lights" and "Energy Star" are examples of such a strategy. Decanio (1998) finds that the returns to investments made as a result of the "Green Lights" program were higher than for other investments of comparable risk. He concludes that managers had failed to recognize these opportunities and that government-provided information stimulated their discovery. Consistent with Decanio's finding, Howarth et al. (2000) also observe that other types of governmental programs induce firms to investment in cost-saving opportunities. Yet, neither study measures how expensive the discovery of these improvements would have been without the free government-provided information, and thus cannot demonstrate managers should have expended the necessary effort to find the opportunities themselves.

A second way that government can facilitate the flow of information to decision-makers is by reducing transaction costs that may impede information transfer. For example, government requirements that firms report waste byproducts can reduce the cost of finding potential buyers

of these byproducts (King & Shaver, 2001). Government disclosure requirements also may help alleviate problems caused by misaligned incentives between "principals" and "agents". As discussed in the previous section, agents may have an incentive to inflate cost estimates so as to obtain additional funds for pollution reduction. By precluding this possibility, regulation can facilitate better investment decisions (Ambec & Barla, 2002).

Scholars have also investigated whether more traditional types of regulation (e.g. emissions levels or technological requirements) can cause firms to uncover unrealized profit opportunities. Jaffe and Palmer (1997) find that regulation leads to R&D expenditure but not necessarily to patent innovation, while Nameroff and Garant (2004) finds significant evidence that regulation leads to patenting innovation. Brunnelmeler and Cohen (2003) find that regulation (as measured by pollution control costs) leads to a higher rate of patenting, but find no evidence that greater enforcement or monitoring causes innovation. King (1995) reports that equipment purchased to comply with regulation also revealed the causes of hidden production problems, and helped firms to realize significant operational improvements.

Other studies have sought to determine if the realized cost of stringent regulation matches *ex-ante* predictions. Majumdar and Marcus (2001) find that stringent regulation, if well designed, positively influences productivity. Morgenstern et al. (2002) find no evidence that it harms employment. Using data envelopment analysis, Managi et al. (2005) suggest that environmental regulations reduce productivity in the short term, but lead to long term increases in total factor productivity. Isaksson (2005) finds that among 114 facilities, reductions in nitrous oxide emissions were accomplished at little or no cost and he infers evidence for extensive ex-

ante production inefficiencies. Yet, he concludes that regulation allowed the discovery of "low hanging fruit" but did not provide competitive advantage.[2]

***Stakeholder stimuli*.** Governmental stimuli could help to explain the competitiveness of industries, but cannot easily explain competitive heterogeneity among firms. Researchers with interest in the NRBV propose that environmental stakeholders can sometimes fulfill this role.

One explanation for stakeholder influence on innovation follows a logic first proposed by Coase (1960). Stakeholders wish to encourage firms to improve their performance, but are impeded from doing so by transaction costs. One way to overcome this problem is for stakeholders to invest in innovations that are both valuable and better for the environment. Stafford et al. (2000) report an example that precisely matches this story. Concerned by the effect of CFC refrigerants, the environmental group Greenpeace helped design and market a CFC free "greenfreeze" refrigerator (Stafford et al., 2000). They transferred the technology first to one firm and then to the rest of the industry. Outside of the United States, this technology now controls the majority of the market (Stafford et al., 2000).

Several authors have reported a relationship between stakeholder involvement and performance improvement. Anton and Deltas (2004) report that stakeholders often encourage the adoption of environmental management systems, and they find that these systems are associated with performance improvement. Klassen and Vachon (2003) find that customer-initiated collaborative activities increased waste prevention. Roome and Wijen (2006) report that stakeholder involvement can facilitate learning and improvement. Stafford et al. (2000)

[2] Several scholars propose that the potentially beneficial effects of regulation are contingent on the design of the regulation or on the match between regulation and other organizational and institutional factors. This extensive literature, however, is not reviewed here. See Hahn and Stavins (1991) for a complete review.

suggest that environmental groups can provide firms with extended networks enhancing firm "bridging" capabilities. Some evidence suggests that such close stakeholder connections can lead to greater financial performance. Hillman and Keim (2001) find that stakeholder management can improve shareholder value – particularly when those shareholders represent suppliers and local communities.

Stakeholders may also be able to help firms resolve market imperfections that prevent them being rewarded for superior performance. By acting as credible conduits for unobserved information, stakeholders may allow firms to charge a premium for environmental attributes (Reinhardt, 2000). We will consider this role further in the second half of this article.

The Bottom Line: Does It Pay To Be Green?

Ultimately, whether it pays-to-be-green is a question that must be answered by empirical analysis of the link between environmental and financial performance. Elsewhere, Margolis and Walsh (2001; 2003), Allouch and LaRoche (2005), and Koehler et al. (2005) have reviewed this literature, and we will provide only a brief summary here.

In general, three different types of tests have been employed. Some studies look for a contemporaneous association between environmental and economic performance. To correct for the possibility that unobserved heterogeneity might explain observed relationships, some scholars have investigated the relationship between changes in environmental and changes in financial performance. Finally, some scholars have used event study methodologies to explore the response of financial markets to new information about environmental performance. Konar and Cohen (2001) perform a cross-sectional analysis of the association between

environmental performance and financial performance (Tobin's q). They find evidence of a negative relationship between toxic emissions and firm valuation. However, they recognize that unobserved firm attributes could account for the relationship. To partially rule out unobserved factors, Hart and Ahuja (1996) and Russo and Fouts (1997) evaluate the relationship between changes in environmental performance and changes in financial performance; both find evidence of a strong positive relationship. King and Lenox (2002) argue that such findings may be explained by misspecified models or constructs. Employing a ten-year panel and more conservative specifications, they find no significant relationship between emissions and financial performance. Yet, they do find a modest causal relationship between waste reduction and financial performance. Other scholars have investigated the investment timing, where early investments in environmental innovation could allow firms to gain and maintain a competitive advantage over late movers. Exploring the paper industry Nehrt (1996) finds that early pollution-reducing technology investments by first movers boosted profit growth, while late movers were not able to catch up, despite of copious investments. Finally, several scholars have contingencies for "pays-to-be-green" arguments. Christmann (2000) argues that profitable green can only occur if the firm has the complementary assets to protect their advantage. For example, Darnall and Edwards (2006) find that facilities with stronger internal capabilities prior to the adoption of environmental management system experienced lower adoption costs than facilities with fewer capabilities.

Other scholars have used event study methodologies to evaluate stock market responses to the release of information on environmental performance or news of an environmentally significant event. Several scholars have investigated how markets respond on the day that government data on toxic releases are announced, and they have found that such announcements

are associated with significant losses (Hamilton, 1995; Khanna, Quimio, & Bojilova, 1998). However, Koehler and Cram (2001) argue that such studies fail to account for contemporaneous correlation in stock price movements. Reanalyzing data on market responses to TRI reports, Koehler and Cram (2001) find a statistically significant but weak relationship.

Summarizing the findings, Margolis and Walsh (2001; 2003) report evidence of a generally positive relationship between social (including environmental) and financial performance. Olitzsky et al. (2003) criticize their methodology and perform an alternative meta-analysis on 52 studies. Yet, they too conclude that environmental performance is positively correlated with financial performance. Moreover, they report a causal relationship in both directions: firms with slack resources invest more in environmental and social practices, but green practices help them to be more efficient and competitive. Most recently, Allouch and LaRoche (2005) again find evidence of a positive relationship. They argue that their meta-analytic technique allows a better estimate of the economic effect of the relationship, and helps them identify firm and location characteristic that moderate its strength.

Summary and Future Directions

This section represents a quick postcard of research on the radical idea that it might "pay to be green". We discuss progress made by researchers in understanding 1) what might cause managers to systematically overlook profit opportunities and 2) what role external agents might play in stimulating the discovery of such opportunities. By focusing attention on these issues, PTBG scholarship has helped expand understanding of the sources of competitive advantage.

Pays-to-be-Green research has created the outlines of one theory for why managers might systematically miss profit opportunities. This research suggests that for new performance criteria that are not priced by markets and for which organizations lack information gathering systems, managers tend to use heuristics in making investment decisions. Biases in these heuristics can cause systematic underinvestment.

Pays to be green research has also identified conditions where governments or stakeholders can provide an important stimulus for improvement. By assuaging organizational barriers, by reducing transaction costs, or by directly providing information, government can increase the flow of information available to managers and improve their decision-making. Stakeholders can also act as information conduits to firms or can directly negotiate mutually beneficial changes in corporate practice.

Yet, these summaries veil a growing divergence among scholars about the potential for win-win improvements to provide meaningful environmental and financial gains. Some scholars have drawn parallels between neo-Schumpeterian theories of new market entry and PTBG theory to suggest that firms can profit while improving economic, social, and environmental conditions in the developing world (Hart & Christensen, 2002). These scholars argue that organizational and cognitive factors cause managers to undervalue systematically the market potential of the world's 4 billion poorest people (London & Hart, 2004; Prahalad & Hammond, 2002). They argue that such underinvestment creates enormous potential for profit, and those firms that address these markets will find fortunes hidden at the "base of the pyramid". Moreover, the economic activity that generates these profits will also improve the environmental and social conditions of these desperately poor people.

Other scholars have become skeptical of any "rule of riches" that suggests firms can always profit by increasing their environmental performance. Such optimism, so clearly evident in early studies, has given way to a more moderate position that environmental performance improvement may pay only for some firms, or in certain cases, or in certain time frames. Continuing research on such contingencies, we believe, will prove useful theoretical and practical insight.

Finally, evidence of a contingent or economically marginal relationship between environmental and financial performance suggests to some scholars that meaningful gain in environmental performance will require more than the resolution of overlooked profit opportunities (Orsato, 2006; Zadek, 2001). Real gains will entail changing the business climate and the rules of competition. Clearly, such change could come from government and national institutions. Increasingly, however, scholars also suggest that firms themselves can play an important role in setting rules that support a "greener" competition. How firms do this is the topic of our second academic postcard.

POSTCARD II: SELF-REGULATION

In the previous section, we considered whether, *given the existing rules of competition*, firms could profit from improving their environmental performance. Now we consider whether firms themselves can create rules that allow a better and greener competition. In so doing, we shift the attention away from potential inefficiencies in a firm's operational choices to potential inefficiencies in market competition.

A postcard length synopsis of this section might read: “Leviathans not needed. Researchers study how firms use a little-known type of institution to solve common problems.” With a bit more space, we might add that it is rather surprising that these “self-regulatory” institutions are so little known, because they have been hiding in plain sight. And, we might add that the Business and Environment literature has contributed to broader management theory by increasing awareness and consideration of these institutions.

The Role of Institutions in Preventing the Tragedy of the Commons

Institutions are the “humanly devised constraints that structure political, economic and social interaction” (North, 1990: 97). For anyone interested in environmental issues, “the tragedy of the commons” famously illustrates why such institutions are needed. According to Hardin (1968), “the inherent logic” of common ownership “remorselessly” leads to collective ruin. As each actor attempts to maximize their own return, they impoverish themselves. Common fields become overrun with sheep, common fisheries are driven to exhaustion, and even common atmospheres become damaged by pollution.

To prevent such common tragedy, Hardin reasons, a central authority – what Hobbes called a “leviathan” -- should control use of the common resource. Attempts by the actors to “self-regulate” solutions without recourse to this authority should be viewed with skepticism. Self-regulation creates public value, and thus again causes a kind of “commons problem”. Each firm would like another to abide by common rules, but each also has an incentive to defect.

But is self-regulation indeed impossible? The scholars reviewed in this section think not. They investigate instances where the actors themselves try to solve common problems by

creating self-regulatory institutions. Neither markets nor hierarchies, these institutions present exciting new "problems for theory" (in Karl Popper's sense of the phrase) that can help refine and extend existing theories of how institutions form and operate (Popper, 1968).

Self-Regulatory Institutions: Lost and Found

Institutions come in a diverse array of forms. They can be private (e.g. firms) or public (e.g. governments), and they can be hierarchical or decentralized. The self-regulatory institutions that we consider in this section are usually classified as "private" (because it is possible for participants to opt in or out), and "decentralized" (because they have flat structures of authority and little or no system of central enforcement).

Self-regulatory institutions (SRIs) are often thought to be rare and new. In fact, they are neither. Examples include voluntary codes of conduct, trade association sponsored standards, and management certification programs. They have been documented in industries as diverse as accounting, electronics, computer software, agriculture, and banking (Furger, 1997). Why have they been neglected by management scholars?

One explanation is that the two dominant strands of institutional theory do not provide a comfortable home for self-regulatory institutions. For one strand of theory, institutional choice lies along a line between markets and hierarchies – leaving little room for self-regulation (Coase,

1960; Williamson, 1975). For a second strand of theory, institutions obtain their authority through their very constancy. Thus the idea that agents can self-regulate solutions conflicts with the mechanisms that are thought to infuse institutions with power. A final explanation has already been discussed above: scholars remain influence by the metaphor of "the tragedy of the commons" and it's message about the impossibility of self-regulation.

In the 1980s and 1990s, growing empirical evidence began to change these perspectives. Case studies, histories, and experimental research appeared that provided evidence that actors using common resources, despite their misaligned incentives, were able to coordinate solutions (c.f. Khanna, 2001; Ostrom, 1990). Much of this work was conducted, supported, or inspired by Elinor Ostrom. Using numerous theoretical perspectives and methods, she explored how participants could self-regulate common-pool resource problems and avoid the "tragedy of the commons" (c.f. Ostrom, Gardner, & Walker, 1994).[3]

Drivers of Self-Regulation in Modern Industries

Common-pool resources, like the ones discussed in "The Tragedy of the Commons" and investigated by Elinor Ostrom, conjure up images of meadows and fish ponds, but common pool resource problems exist in modern industrial economies as well. Modern corporations use open access fisheries (Schlager & Ostrom, 1992), access shared water or energy resources (Dayton-Johnson, 2000; Hanna, 1997), contribute to shared knowledge resources (Furman & Stern,

[3] Among management scholars, Ostrom's work has had the greatest impact on researchers investigating human decision-making in experimental strategy games – particularly social dilemmas (Weber, Kopelman, & Messick, 2001). For the rest of the academy, Ostrom's work in particular, and self-regulation in general, has been slow to take hold. Business and environment scholars were among the first to draw inspiration from her research.

2006), and so on. Self-regulatory institutions exist in these settings, but many more occur in industries with no apparent common-pool resource (c.f. Khanna, 2001). What could explain the need for self-regulation in these settings? An important area of research for business and environment scholars has been to theorize and empirically test possible drivers of self-regulation. This research has identified common sanctions and asymmetric information as particularly important causes.

Common sanctions. To explain the emergence of self-regulatory institutions in industries that do not share a common physical resource, some authors have argued that common problems can arise from interaction with other institutions or institutional actors. Blunt application of force by governments or stakeholders can unite the fate of all firms in an industry. For example, if regulation is determined by an industry's collective performance, a classic social dilemma is created in which each firm wishes others to improve, but has little incentive to do so itself (Dawson & Segerson, 2005; Maxwell, Lyon, & Hackett, 2000). Likewise, stakeholder's inability to differentiate performance among firms can cause a common risk of sanctions. For example, the Earth Island Institute initiated a boycott of all albacore tuna – despite the fact that some companies sourced their tuna from locations where porpoises were not put at risk by tuna fishing (Reinhardt & Vietor, 1996).

Several studies have quantified this industry commons by investigating if the behavior of one firm influences the perceived value of another firm in the industry. Research has demonstrated that an accident at one firm can influence the stock price of another (Hill & Schneeweis, 1983). Likewise product recalls at one pharmaceutical firm or automaker influence the value of other firms (Jarrell & Peltzman, 1985). This "sanction commons" increases the more similar are the firms (Blacconiere & Patten, 1994).

Dawson and Segerson (2005) propose that a common risk of government regulation can drive the formation of self-regulatory institutions. They assert that such institutions forestall government regulation by helping coordinate collective improvement. In concert with this idea, Barnett and King (2006) find evidence that an important example of self-regulation in the chemical industry (the Responsible Care Program) arose after a deadly accident in Bhopal, India increased the importance of a "reputation commons". They report that after the Bhopal accident investors punished firms similar to those where an accident had occurred, and they find that these joint sanctions diminished after the formation of the program.

Asymmetric information. Since Akerlof (1970), scholars have recognized that asymmetric information can cause a collective problem by creating an inefficient "market for lemons" in which only low quality products can be sold. To solve this problem, firms must credibly communicate the quality of their goods and services. Doing so does not necessarily create the need for collective action. In some cases, firms can differentiate themselves from their peers by engaging in visible acts that reveal their unobserved quality. But business and environment scholars have argued that for many environmental problems, these solutions are not feasible (c.f. Reinhardt, 2000).

The environmental aspects of a good or service – how its production effects the environment or how it will decompose over time – are usually hidden attributes. Customers can not determine by inspection whether or not the cotton in a pair of trousers was grown in an organic manner or a pound of coffee beans were grown under a natural forest canopy. For these types of goods, a warrantee or a reputation is still suspect, because the stakeholder may never know whether he or she has been deceived (Reinhardt, 2000). To provide a credible means of communicating unobserved quality of these "credence goods", firms often need to set up a

common infrastructure for inspection and certification (Darnall & Carmin, 2005). Scholars have proposed that many self-regulatory institutions that require changes in behavior and certification of these changes help firms communicate unobserved attributes of their products or processes to customers (King, Lenox, & Barnett, 2002).

Sponsors and Origins

Given the drivers of self-regulation presented above, how do self-regulatory institutions form? Who sponsors them? How do they emerge? What conditions enable them to operate? Early work in the business and environment literature sought to categorize the numerous sponsors of self-regulatory institutions (c.f.Nash & Ehrenfeld, 1997). Corporations, trade associations, international organizations, and stakeholders all have been prime movers behind the creation of one or more example. Some programs, like the Marine Stewardship Council, were formed by the collaboration of corporations and stakeholder groups (Reinhardt, 2000). Still other programs were created by international organizations like the International Organization for Standardization (e.g. ISO 14001). In some cases, several types of actors have played an entrepreneurial role. For example, the Chemical Industry's Responsible Care program was influenced by the Canadian CAER program, the Chemical Manufacturer's Association, and personal sponsorship by Robert Kennedy, CEO of Union Carbide (Rees, 1997).

Other work has explored the historical process through which SRIs emerge. Several studies have identified shocks or scandals as playing a particularly important role in catalyzing formative action. For example, Rees (1988) reports that the accident at Three-Mile-Island helped spur the formation of the nuclear industry's INPO program (Rees, 1994). Similarly, the accident at Bhopal seems to have played a critical role in driving the formation of the Chemical Industry's Responsible Care Program (Barnett, 2004; Rees, 1997). In the petroleum industry, the Valdez accident encouraged the development of both the "Valdez Principles" and the STEP program (Lenox & Nash, 2003). A smuggled video of dolphins being caught and tortured on Tuna boats provided impetus for the creation of the "dolphin safe" certification system (Reinhardt, 2000).

Other scholars have argued that industry shocks are just part of a more continuous process of field level institutional change that leads to the creation of more formal self-regulatory structures. Hoffman (1999) argues that frames of perception in the chemical industry evolved as new metaphors appeared for how firms interact with their surroundings. Early metaphors of pollution as a problem of "regulatory compliance" gradually changed to ones of corporate strategy and profitability. As shared frames of perception changed, responses included more strategic considerations, and firm interaction with stakeholders took on new forms. Yet, Hoffman (1999) also argues that "*change can emerge suddenly and unpredictably*" (:366) as exogenous events (e.g. the publication of Rachel Carson's Silent Spring) or endogenous events (accidents and spills) influence taken-for-granted assumptions (Carson, 1962). Hoffman and Ocasio (2001) argue that such events have greater impact when they violate existing norms and frames.

Research on the conditions needed to allow effective self-regulation have emphasized the importance of monitoring and sanctions. Based on the history of Responsible Care and the

Institute of Nuclear Power Operations (INPO), Rees (1997) argues that self-regulation is more likely to take hold when the industry is closely connected (incestuous in his language) so that important actors can monitor behavior. Moreover, he argues, self-regulation is fostered by a central forum for communicating and discussing governance issues. Furger (1997) argues that overlapping oversight by different institutional actors allowed monitoring of conformance to self-regulatory safety institutions in the maritime shipping industry. He further argues that sanctions and rewards from insurance companies provided incentives to conform with agreed upon standards. He finds that when market pressure and new industry entrants eroded these conditions, self-regulatory institutions lost the power to control behavior. Lenox and Nash (2003) echo the importance of sanctioning mechanisms and empirically confirm their effect.

Sanctioning mechanisms – emphasized by the authors discussed above – represent a critical challenge for self-regulatory institutions, because in many countries group-level coercion is illegal. Anti-trust regulation designed to prevent anti-competitive behavior also restricts the ability of firms to coordinate sanctions against another firm. In a few cases, self-regulatory structures can call on state government to provide enforcement (c.f. Rees, 1994), but that is not usually possible. How then do self-regulatory structures coordinate action? The next section considers research on this issue.

Sources of Power

Most of the research by business and environment scholars on environmental self-regulatory institutions has investigated how these institutions obtain the power to influence behavior. Because this is both a large and difficult question, scholars have emphasized two

broadly differing perspectives. One argues that institutions obtain power by becoming institutionalized in social settings. As a result of this process, agent cognition and choice are constrained, and certain opportunistic behaviors are prevented. Another perspective argues that agents continue to have the freedom to behave opportunistically, but are constrained from doing so by their own self-interest.

From the first perspective, self-regulatory institutions represent pre-conscious or post-conscious constraints on strategic behavior. Pre-conscious constraints occur because institutions include taken-for-granted elements that create powerful schema or frames for decision-making (Berger & Luckmann, 1966). These elements influence what is perceived by decision makers and what choices are considered. Post-conscious constraints "*directly or indirectly divert design adoption away from the proposed dynamic in transaction cost economics (i.e., comparative efficiency) and toward the dynamic of legitimacy*" (Roberts & Greenwood, 1997:355). These constraints "*cause actors who do recognize and try to act on their interests to be unable to do so effectively*" (Dimaggio, 1988:5).

From the second perspective, self-regulatory institutions represent nothing more than the manifest outcome of strategic interactions. Drawing on the theory of cartels and clubs, scholars have developed many formal models of self-regulatory institutions (Barrett, 1994; Dawson & Segerson, 2005; Potoski & Prakash, 2005b). In most of these models, actors propose rules for the group to which the group responds by deciding whether to participate and how to behave. In making these decisions, each actor considers how all others will behave, and how different options will influence the decisions of other actors. By considering this process in detail, scholars identify one or more equilibrium where each actor will be making his or her best

decision (given what he expects everyone else to do). The "institution" as it is observed in business practice is the expression of this equilibrium.

To explore these two perspectives, business and environment scholars have sought to evaluate the predictive power of the above two broad strands of institutionalism. Most commonly, these studies have sought to develop models of 1) who participates in self-regulatory institutions and 2) how participation influences performance.

The three pillars. In search of evidence of pre and post conscious constraints applied by self-regulatory institutions, several authors have investigated whether cognitive, normative, or coercive pressures influence participation in self-regulatory institutions. Delmas (2002) finds that "*regulatory, normative, and cognitive aspects of a country's institutional environment greatly impact the costs and potential benefits of the ISO 14001* [environmental management] *standard and therefore explain the differences in adoption across countries"* (Delmas, 2002: 91).[4] Several authors find that government regulation or support was an important determinant of participation in a self-regulatory institution (Chan & Wong, 2006; Rivera, 2004; Rivera & de Leon, 2004; Rivera, De Leon, & Koerber, 2006; Shin, 2005). Neumayer and Perkins (2004) find that participation in ISO 14001 is influenced by pressure from local wealthy stakeholders, civil society, and foreign customers in Europe and Japan. Albuquerque et al. (2004) find evidence that national-culture differences influence the diffusion of ISO 14001 among countries.

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4 To specify the management system standards that became ISO 9000 and ISO 14000, the International Organization for Standardization (ISO) convened technical advisory committees comprised of representatives of numerous companies, NGOs, and governments. ISO 9000 is primarily concerned with quality management and ISO 14000 with environmental management. Collectively, over 800,000 organizations in 161 countries have been certified as having adopted these standard management practices.

Many studies, including several designed to test economic models of institutions, report a link between participation in one SRI and involvement in another. Such a connection is difficult to interpret, but it might suggest evidence of normative pressure or mimetic behavior. Corbett and Kirsch (2004) find that "*patterns of international certification to ISO 14000 are strongly correlated with those to ISO 9000*" (: 339). King and Lenox (2001) find a strong relationship between ISO 9000 adoption and ISO 14000 adoption. Viadiu and Fa (2006) find that the diffusion pattern of ISO 14000 matches that of ISO 9000. In contrast, using a different diffusion model, Melnyk et al. (2003b) find that adoption of ISO 9000 was not associated with adoption of ISO 14000.

Jiang and Bansal (2003) make an important distinction between adoption of the underlying technical aspects of self-regulatory institutions and visible association with the emblem of the institution. Based on interviews with managers at 16 companies, they conclude that regulatory and social forces tend to predict adoption of environmental management systems, but that strategic choice drives the decision to certify these systems under ISO 14001. They find that when tasks were less visible or the outcome of these tasks more "opaque" to viewers, managers sought to demonstrate their actions by certifying with ISO14000. King et al. (2005) quantitatively test this idea in a larger setting and find corroborating results.

Strategic choice. To investigate the predictive power of the second brand of institutional theory (that strategic action shapes the functioning of institutions), several authors looked for standard signs of opportunism. These authors predict that programs without strict entry rules will fall victim to "adverse selection", and ones without means of enforcing compliance will suffer from "moral hazard".

King and Lenox (2000) demonstrate that the Chemical Industry's Responsible Care program suffered from both adverse selection and moral hazard. Participating firms tended to pollute more than comparable firms in the same industry, and their rates of improvement slowed after the creation of the program (King & Lenox, 2000). Howard et al. (2000) find evidence consistent with these findings in interviews in 16 firms; they conclude that participation of Responsible Care provided "*a poor indicator that any particular standard practices will be followed*" (:281).

In three important studies, Rivera and de Leon demonstrate that self-regulatory programs with weak enforcement also exhibit telltale signs of strategic opportunism. They show that participants in a hotel "eco-label" in Costa Rica did not have superior environmental performance (Rivera & De Leon, 2005). They also find that participants in a self-regulatory program among ski areas (the Sustainable Slopes program) had lower performance than non-members (Rivera & de Leon, 2004; Rivera et al., 2006). Moreover, they find no indication that this deficit had been resolved 5 years after the program's initiation.

Studies on programs that include stronger sanctions or that can draw on sanctions from another institution reveal fewer signs of opportunism. Rees (1994) attributes the success of self-regulation among nuclear power plant operators (INPO) to their ability to use the threat of sanctions from government regulators to prevent free riding. In a study of a "voluntary initiative" between government and industry – the 33/50 program[5] -- Khanna and Damon (1999) predict that the governmental oversight on the program will reduce the tendency for firms to free ride. In support of this idea, they find that participants in the program improved their performance more than non-participants. Lenox and Nash (2003) compare four self-regulatory

[5] Firms voluntarily pledged to reduce their emissions of 17 key chemicals by 33% and then 50%.

programs and claim that the more successful ones include internal sanctioning mechanisms to prevent free riding.

Equilibrium Outcomes. A true test of a strategic-equilibrium theory of institutions would do more than show evidence of strategic choice, it would demonstrate that calculated equilibrium accurately predict observed behavior.

Tests of incentive-compatible equilibria can be accomplished most easily for institutions that appear to help firms "signal" unobserved firm or facility attributes. Most commonly, scholars have investigated whether, as predicted by signaling models, participants have higher performance than non-participants on some performance dimension that is not readily observable to customers (or other important stakeholders).

Evidence suggests that validation and certification systems are important determinants of the signaling potential of SRIs. As discussed above, for two programs with weak validation and certification systems, Rivera and de Leon (2004; 2005) find that participation did not provide evidence of superior performance. In contrast, for the ISO 14000 standard, which does entail certification by an approved third party, several authors have found evidence that certification could be a market signal. Yet, these authors do not find evidence for the simplest signaling story – that certification provides evidence of relatively superior performance. Instead they argue that certification provides evidence of superior efforts to improve or superior improvement rates. Potoski and Prakash (2005a; 2005b) and Toffel (2004; 2006) finds that firms improve their performance after certifying with ISO 14000. King et al. (2005) find that firms certify with ISO 14000 when they need to communicate the existence of internal environmental management systems to distant or foreign exchange partners.

Tests of equilibrium market signaling models of SRIs have also investigated the financial performance of participants and non-participants. Signaling models suggest that participants in SRIs should benefit financially, because the signal allows them to charge customers for superior quality. Because ISO 14000 has been adopted by a relatively small number of facilities (at least in the US), scholars have turned their attention to its close cousin – the ISO 9000 Quality Management Standard. Terlaak and King (2006) report that certification is associated with a moderate increase in production – suggesting that certification helps attract marginal customers. Corbett et al. (2005) find that ISO 9000 certification is associated with substantially higher financial returns.

Equilibrium models of cartel-like self-regulatory institutions are much harder to test. Depending on the precise structure of these models, multiple equilibria may exist and different static hypotheses can be generated. In general, however, these models suggest that a) participants should benefit from participating, b) non-participants should benefit from not participating, and c) the institution should provide some welfare benefit to the participants (Barrett, 1994; Dutta & Radner, 2004). These models usually suggest, moreover, that the biggest gains should accrue to the non-participants, because these free-riders appropriate the value of the program without accruing any of the cost. These expectations have been best explored with respect to the Responsible Care program. Lenox (2006) finds that the creation of the program provided dramatic financial benefits to most firms in the industry, and he finds that non-participating firms benefited considerably more. Barnett and King (2006) find that the devastating chemical accident in Bhopal, India created a common sensitivity to accidents such that an event at one firm would influence the stock price of another. They find evidence that the

self-regulatory program reduced this tendency, but benefited non-participants more than participants.

A theoretical problem for many researchers exploring equilibrium models of self-regulatory institutions is that the evidence for environmental and financial consequences often seems to provide contradictory insights. For example, scholars have tended to argue that the Responsible Care Program represents a means of forestalling government regulation (Dawson & Segerson, 2005; Rees, 1997). If so, participants should improve their environmental performance, because the program helps them cooperate to prevent regulation. However, as discussed earlier, just the opposite seems to be true – after joining the program, participants appear to slow the rate at which they reduced their emissions. Financial benefits from such a program may suggest credulous stakeholders that ascribe meaning to a program without a rational basis. Alternatively, studies demonstrating adverse selection and moral hazard may have missed important variables of interest to stakeholders (like accident prevention) upon which the participants did improve.

Another problem for theory is that some self-regulatory institutions seem designed in such a way as to provide conflicting incentives. Darnall and Carmin (2005) suggest that variability in the rules and mechanisms among self-regulatory institutions confuses interpretation of participation. Surveying 61 examples, they find great variation in the purposes, design concepts, and rules. They suggest that if stakeholders (or researchers) lump programs together, they will tend to respond inefficiently to the programs. Terlaak (2007) argues that some programs actually contain conflicting design objectives. She argues that some programs hope to provide both useful best-practice guidelines and a means of distinguishing high and low performing firms. The problem, she notes, is that the worst firms stand to gain the most from the guidelines, and that

this can lead to an "adverse selection" of firms. Such conflicting objectives, she notes, can destroy the usefulness of certification as a means of identifying organizations with better hidden attributes.

Summary and Future Directions

The management literature has neglected the potential for firms to use self-regulatory institutions to solve common problems. In part this oversight stems from a poor fit with existing dominant theories in the literature. In part it results from pessimism -- as expressed in the metaphor of the "tragedy of the commons"-- about the ability of actors to solve environmental problems without the aid of a leviathan (Thompson, 2000). Recent research on self-regulatory institutions is beginning to change these expectations. This research reveals a world of possibility, not one of inevitable tragedy -- one in which the effected parties look for institutional solutions of their own creation.

Empirical research on self-regulatory institutions reveals that both streams of institutional theory have some predictive power. The strategic pursuit of individual gain plays a central role in the creation of these institutions, and determines how they are understood and used. These decentralized forms are not just "customs in common" that guide our interactions by creating pre- and post-conscious constraints. They are governance structures of our own making into which we enter so that they may constrain us.

Yet this research also seems to reveal that these institutions are not the product of fully rational actors. As of this writing, there is reason to doubt that these institutions represent a manifestation of an incentive-compatible equilibrium. Yes, the evidence suggest that the actors

in these institutions are strategic, but to our eyes it also suggests that they are only limitedly so. They seem to guess what others will do and respond to these expectations, but they also seem unable to guess all possible strategic interactions. At least for a time, behaviors can be contradictory and inconsistent – systems can be out of equilibrium. And, institutions can take on a larger, richer, and different meaning than that justified by purely economic rationale. Programs that fail to improve performance or differentiate better performers, none-the-less grant financial benefits to their participants.

Clearly more research is needed to explore the seeming contradictions, and some efficiency argument may eventually be found to explain the seeming contradictions we review here. But, we believe that the research also suggests the need to consider how these institutions might operate if they are formed by strategic actors whose decisions reflect both a limited ability to anticipate consequences and a bias toward certain interpretations of institutions.

We are not suggesting that fully rational models of institutions should play no role. The precise analysis and prescriptions of these methods will continue to provide a useful benchmark for theoretical and empirical study. Yet, we expect that models that include more limited actors will provide higher fidelity predictions. From this perspective, we believe it will be possible to pose questions that are otherwise unacceptable. We hope it will also be possible to develop theories – and interpret data without reference to particular academic dogma. So, from this narrow ledge, we hope you will indulge us in some eccentric questions.

First, how do innate and public norms influence how actors interpret and engage self-regulatory institutions. Numerous studies have shown that people in many cultures have a propensity to behave “fairly” which cannot be easily explained by rational behavior. These tendencies have been well documented in studies of people in cultures that benefit from fair

dealings (Fehr & Fischbacher, 2003). A potential evolutionary origin for these tendencies has even been suggested by studies of animals (Gintis, Bowles, Boyd, & Fehr, 2003). Do these tendencies also color how actors interpret new institutional forms? If so, could institutions that seem to enshrine fairness garner value that they do not deserve?

Second, how do institutional entrepreneurs understand the institutions that they help to create? Evidence from some of the above studies suggests that the sponsors of some programs envisioned them to play a different role than they eventually came to have. What causes such inconsistency? Can a formal model with rational actors explain such results? Much more research is needed on how institutions might evolve over time. Two of the programs discussed in this review seem to have evolved from leniency to greater oversight and enforcement. Can a model with rational actors explain such an evolution? We think it can, and we suspect that it might even help connect economic concepts with the idea of "legitimization".

Third, existing research has sought to understand the determinants of self-regulation versus no regulation at all. Are the self-regulatory structures reviewed in this section always a second-best alternative to hierarchy or are their some cases where they are preferred? What are the determinants of the choice to employ self-regulation rather than firm or state hierarchy?

Many more questions can be formulated from the literature reviewed in this article. Indeed, the most important contribution of the reviewed literature is that it provides precedence for asking such questions within the field of management.

CONCLUSION

In this article, we send two quick postcards about some of the research being done by "business and environment" scholars. We argue that in these two areas, B&E scholars are developing new theories and evidence that should be of interest to more "mainstream" management researchers. Given the relatively small size of the B&E community, and the common perception that they are located at the periphery of the management literature, what might explain this unexpected role? To provide a possible explanation, and illustrate some possible dangers that the literature holds, we hope you will indulge us in one last metaphor.

Near the little town of Patagonia, Arizona, there is a picnic table that is famous among birdwatchers and ornithologists. It seems that one day, a traveling bird-watcher stopped to eat lunch and happened to spot a rare bird. As is common in the community, he immediately let his friends know of the sighting, and people gathered at the table to see if they could spot this unusual species. As the group stood searching with their binoculars, someone spotted an even rarer bird, and after careful evaluation by the others at the site, the sighting was confirmed. A little while later, another uncommon species was spotted. It too was considered with skepticism, but eventually confirmed. By the end of the afternoon, the group had compiled a long list of rare or locally uncommon species.

You might think that these birders were imagining things, but almost every bird-watcher has experienced something similar. Birds tend to congregate in particular habitats, so the sighting of an interesting bird is often a sign that others are around. Moreover, if you gather a bunch of sharp-eyed people together all looking carefully, they often discover a whole string of species. Among birders, the phenomenon even has a name – "the Patagonia picnic table effect".

We propose that much the same thing has happened in the environmental literature. A few unfamiliar "birds" (i.e. regulation driven innovation, the Porter Hypothesis, examples of self-regulation, and so on) focused the attention of B&E scholars. So organized, these researchers then discovered other examples and related phenomenon. They began to extend and develop theories about these observations. In the end, they developed growing research agendas – two of which we sent you in a postcard (from Patagonia, if you will).

Of course, our metaphor breaks down eventually. Business and Environment scholars have tended to study more carefully a few phenomena, rather than identify entirely "new birds". Yet, the metaphor illustrates both why this literature may be important, and why it must be viewed with some caution.

Each of the birders in the story brought with them their own unique expertise, and thus the many-binoculared monster they formed on the picnic table was vastly more knowledgeable and sensitive than any individual could ever be. Just the same is true for business and environment scholarship. Drawn by their interest in environmental issues, B&E scholars have come from backgrounds in sociology, economics, psychology, and so on. Working together they have shared notes and perspectives, and this has modified the way they have investigated the phenomena. As a result, B&E scholars have been willing both to consider the unexpected and to subject it to skeptical scrutiny. Three examples stand out in our review of the literature.

First, B&E scholars have been willing to break from orthodox disciplinary perspectives. For example, the PTBG literature is fundamentally based in economics, but unlike usual economic models, it considers the possibility that the system under consideration is far from equilibrium. It postulates that decision-makers make choices that are systematically biased and that firms operate distant from efficiency frontiers. Yet, many B&E scholars also view this

conjecture skeptically and subject it to rigorous econometric analysis. Similarly, the B&E literature on self-regulatory institutions includes many competing theories. As a result, its scholars evaluate both whether economic actors use institutions strategically, and whether these institutions place pre-conscious limits on such behavior. The same scholars that have investigated whether institutions represent strategic equilibria, have also investigated whether these institutions are "off the equilibrium path". As a result, B&E scholars are helping to develop theories of "thin rationality" in institutions (to use Ostrom's terminology) that combine economic models with institutional constraints and non-rational behavior.

Second, B&E scholars have been willing to rethink what is endogenous and what is exogenous. For the PTBG literature, this has meant that scholars have been willing to consider the possibility that forces exogenous to the industry can be sources of innovation and comparative advantage. For example, the literature on the Porter Hypothesis considers governments as "information gatekeepers" whose regulation may provide better information and help the industry improve performance and efficiency. The Natural Resource Based View postulates that suppliers and consumers can be sources of valuable innovations. For the literature on self-regulatory institutions, in contrast, B&E scholars have been willing to consider the possibility that institutional formation and change could be endogenous. Solution to collective action problems need not come from outside leviathan, these scholars admit, they can be created endogenously by the effected parties themselves. As with the PTBG literature, information has played a central role in the analysis. SRI scholars have considered the use of information as a "double edged weapon": to be protected within the institution or revealed to inform third parties of unobserved performance.

Finally, given their contemporaneous observation of important changes, B&E scholars have been unusually focused on time. Organizational studies generally and the RBV particularly have tended to neglect time (Ancona, Goodman, Lawrence, & Tushman, 2001; Priem & Butler, 2001). In contrast, both PTBG and SRI literature consider time as both an important theoretical and empirical factor. The PTBG literature postulates a set of time periods that lead to competitive advantage. For the B&E literature on self-regulatory institutions, time has been an important variable of interest. Models of new institutions include periods of decision making (formation, entry, behavior, etc.), and empirical studies have explicitly separated these stages. In both streams, scholars have employed powerful longitudinal methods to study temporal changes.

Yet, for all of its merit, there is reason for caution in drawing general conclusions from the B&E literature. Our metaphor of the Patagonia picnic table again exemplifies the problem. The people in the story are spotting birds because they are experts on rare birds, and they are working together and looking hard – not necessarily because a picnic table in Patagonia, Arizona, is the best place to look. The story provides a reminder that discoveries can arise from focused attention, and not always from a particularly valuable vantage point. Thus, it is possible that focused attention on pays-to-be-green possibilities or attempts at self-regulation has exaggerated or biased the theories and findings reviewed above. Seeking to understand unexpected innovation or self-regulation, scholars may have inadvertently overstated the importance of either. Skepticism, we believe, is vital to the health of the field. Every sighting of a new bird species, as it were, should be evaluated carefully and confirmed by others, before it is put on our list.

We are also confident, however, that environmental issues may indeed represent a good place for scholarly focus. One reason for our confidence is that the “view” of these phenomena

is particularly sharp. Regulatory requirements for disclosure of environmental and business information allow a clear view of contemporaneous changes in competitive advantage. Information on self-regulatory institutions that might otherwise be kept secret (e.g. information about a cartel) are willingly revealed by regulators or by participants. Another reason for our confidence is that environmental issues are both currently important and clearly representative of future business conditions. Finally, "environmental" problems are not restricted to those arising from nature. Common property problems, hidden quality attributes, and the importance of extramural knowledge as a source of competitive advantage are all of growing importance in the "information age". Evaluating how firms address these challenges will require scholars to rethink disciplinary boundaries, reconsider what is exogenous and endogenous, and re-evaluate what are the fundamental roles for business and governing institutions. Business and environment scholarship should inform such research.

In summary, we believe studies of business and environment have provided and will continue to provide new insight for mainstream management scholarship. In other words, we think there just might be something unique or even inspiring about the view from this particular picnic table.

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