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## Postcards from the Edge

### *A Review of the Business and Environment Literature*

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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 have created a body of research providing new insights into two topics of mainstream interest: (a) the sources of competitive advantage and (b) the origin and function of self-regulatory institutions.

#### **Introduction**

During the last 20 years, a research agenda has emerged that is often termed *business and the environment* (B&E). Special issues in several leading management journals have advanced this agenda and it 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. At one time, the word *environment* was understood to mean *nature*, but scholars have realized that this definition is overly narrow and possibly meaningless. Nature has been bound together with human activity for so long that there is little left of any primordial nature. Today, the word environment refers to everything from the health of the community to the appearance of a neighbor's yard.

The meaning of the word environment, as used by many of the scholars reviewed in this chapter, is best understood through its connection to the economic concept of externality. In classic economic analysis, costs and benefits accrue to the transacting parties—or they spill over as externalities to

unconsidered others. As a result, the effect of economic activity can be divided into internalities and externalities—into business and environment (B&E).

By definition then, the 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 problems caused by externalities. Thus, people interested in the environment should be in schools of government or public policy.

As you might guess, we argue in this chapter that this perspective is wrong. What you may not expect, however, is that we do so for different reasons than most other authors. We do not argue that the environment is in such terrible shape that every scholar should consider ways to protect it (though this may indeed be true). Instead, we argue that B&E literature is important because it provides new insights on topics of interest to most business scholars.

The B&E literature provides these insights, ironically enough, precisely because it has been peripheral to mainstream management literature. This position has 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 B&E scholars. For our postcards, we have chosen research that is being conducted to answer two questions: (a) Can firms compete more successfully by protecting the environment? and (b) 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” (PTGB) 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 appeared suggesting that some regulations provided unexpected benefits and revealed that some firms 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 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 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 bring together the two literatures and argue that they share some common approaches and themes. We discuss some limitations on generalization from B&E scholarship and consider implications for future investigation.

### Postcard 1: Pays to Be Green

A postcard-length synopsis of the 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: (a) firms gain little by providing public goods (e.g., clean water or air), and (b) 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 1990s when reports surfaced stating 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 if the regulation had 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 (1995a) proposed that “by stimulating innovation, strict environmental regulations can actually enhance competitiveness” and therefore “partially or more than fully offset the costs” of compliance (Porter & Van der Linde, 1995a, p. 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, it states that firms are doing so in a *systematic* way (Palmer, Oates, & Portney, 1995). Firms miss profit opportunities, Porter and van der Linde (1995a, b) reasoned, 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 by-product, 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 (1995b): “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” (p. 127).

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 the resource’s 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. 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 by-products.

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 also, in the case of resources needed to protect the environment, systematically invest too little (McWilliams & Siegel, 2001). Like the Porter Hypothesis, it therefore 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 Porter Hypothesis) 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 nongovernmental 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 (a) the assumption that managers systematically miss profit opportunities, and (b) 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 the 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 of the theory, however, are more open to the potential for systematic error. For example,

Denrell and colleagues (2003) suggested that prices for some resources are systematically suppressed by ignorance of untried activities.

Investigation of the second claim has provided an opportunity to consider a topic that has been 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 following section, 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 dislike claims that decision makers overlook profit opportunities, and any such claim must be justified both theoretically and empirically (Walley & Whitehead, 1994). Over the last 10 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 systematically overlooked.

*Valuation difficulties.* Scholars have given three reasons as to 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.<sup>1</sup> 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 previously mentioned 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 have drawn inspiration from classic theories of organizational design (Galbraith, 1973; Thompson, 1967) and more recent theories based on “lean production” (Womack, Jones, & Roos, 1991). For example, Cebon (1992) and Ashford and Heaton (1983) found case evidence that the creation of specialized environmental departments can buffer the organization from new demands and, thus, restrict information flow about possible improvements. Klassen and Whybark (1999) used surveys from 83 firms to investigate the effect of investment in end-of-pipe buffers (e.g., pollution-control equipment). They found investments in end-of-pipe controls to be associated with lower performance, while investments in pollution prevention to be 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) found that specialized environmental units and operators of waste-treatment equipment often discover or transfer information about profitable, but unrealized, waste-reduction opportunities. Melnyk, Sroufe, and Calantone (2003a) reported 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 et al., 2003a). Florida and Davison (2001) found that firms adopting environmental-management systems were able to gather more accurate information on their activities resulting in reduced environmental risks for the community.

A particularly fruitful avenue for empirical research on the role of organizational structure in unleashing unrealized profit opportunities has investigated 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 (a) the use of lean production will inform managers of the value of waste reduction efforts (Klassen, 2000), or (b) the idea of reduced inventory can be extended to cover the benefits derived from reduced inventory buffers that will also accrue from reduced waste treatment buffers. Consistent with this idea, Rothenberg, Pil, and Maxwell (2001) discovered that the use of lean production reveals ways to minimize waste and make better use of production inputs. Klassen (2000) reported that “quality-related organizational systems” were associated with greater investment in pollution prevention and recycling. Pil and Rothenberg (2003) found that environmental and manufacturing improvement efforts are “synergistic and reciprocal”. King and Lenox (2001) also discovered evidence that adoption of lean production is related to environmental-performance improvement.

While the studies just discussed suggest that differences 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) used panel data to investigate behavior before and after the creation of corporate environmental information provision offices. They found that the creation of such offices anticipates the adoption of environmentally beneficial practices. Yet, their study did not 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 (just described above) do not provide a complete theory as to 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 that managers will use “hard” numbers in making decisions and more likely they will rely on intuition or rules of thumb. It is these heuristics, PTBG scholars have argued, that cause managers to miss win-win opportunities to improve both environmental and financial performance.

Scholars have suggested 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 just discussed, 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 have noted that other known cognitive biases may reduce investment in environmental resources. Bazerman and Hoffman (1999) suggested that individuals tend to use irrationally high discount rates and argued that such a bias suppresses investment in factors that provide deferred returns—a case that is common for environmental performance. Hoffman and colleagues (1999) argued that biased decisions result from the 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) argued that commonly used metaphors can influence the framing of problems and influence investment. Both Mylonadis and Hoffman used case studies to test their claims, and both found 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, Wade-Benzoni, Messick, and Bazerman (2000) argued that certain types of regulation may trigger damaging heuristics and biases. They argued 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 nonconforming ones (Tenbrunsel et al., 2000). Employing an experimental research design, they found that subjects give greater value to a particular option when it is presented as a standard. They inferred that framing something as a standard causes cognitive distortions that increase “*the attractiveness of standard-conforming solutions over that of nonconforming solutions*” (Tenbrunsel et al., 2000, p. 854).

Finally, Kunreuther and Pauly (2004) argued that people often underestimate the cost of rare events. For this reason, they contended, people fail to buy the optimal amount of insurance against natural disasters such as earthquakes, hurricanes, and so on. Kunreuther and Bowman (1997) and Kleindorfer and Saad (2005) argued that similar difficulties in evaluating rare events like chemical accidents and spills could cause managers to systematically underinvest in the 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 in the last section). 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 such as Green Lights and Energy Star are examples of such a strategy. Decanio (1998) found that the returns to investments made as a result of the Green Lights program were higher than for other investments of comparable risk. He concluded that managers had failed to recognize these opportunities and that government-provided information stimulated their discovery. Consistent with Decanio's finding, Howarth, Haddad, and Paton (2000) also observed that other types of governmental programs induce firms to investment in cost-saving opportunities. Yet, neither study measured how expensive the discovery of these improvements would have been without the free government-provided information, and thus did not demonstrate that 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 oblige firms to 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 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) found that regulation leads to R&D expenditure but not necessarily to patent innovation, while Nameroff, Garant, and Albert (2004) found significant evidence that regulation leads to patenting innovation. Brunnermeier and Cohen (2003) found that regulation (as measured by pollution-control costs) leads to a higher rate of patenting, but found no evidence that greater enforcement or monitoring causes innovation. King (1995) reported 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) found that

stringent regulation, if well designed, positively influences productivity. Morgenstern, Pizer, and Shih (2002) found no evidence that it harms employment. Using data-envelopment analysis, Managi, Opaluch, Jin, and Grigalunas (2005) suggested that environmental regulations reduce productivity in the short term, but lead to long-term increases in total-factor productivity. Isaksson (2005) found that among 114 facilities, reductions in nitrous-oxide emissions were accomplished at little or no cost, and he inferred evidence for extensive ex-ante production inefficiencies. Yet, he concluded that regulation allowed the discovery of “low-hanging fruit,” but did not provide competitive advantage.<sup>2</sup>

*Stakeholder stimuli.* Governmental stimuli may help 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, Polonsky, and Hartman (2000) reported 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 first transferred the technology 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, Deltas, and Khanna (2004) reported that stakeholders often encourage the adoption of environmental management systems and find these systems to be associated with performance improvement. Klassen and Vachon (2003) found that customer-initiated collaborative activities increased waste prevention. Roome and Wijen (2006) reported that stakeholder involvement can facilitate learning and improvement. Stafford and colleagues (2000) suggested that environmental groups can provide firms with extended networks, thereby enhancing firm “bridging” capabilities. Some evidence suggests that such close stakeholder connections can lead to greater financial performance. Hillman and Keim (2001) found 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 further consider this role in the second half of this chapter.

*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, Bennett, Norris, and Spengler (2005) have reviewed this literature, and we provide only a brief summary of it here.

In general, studies have employed three different types of tests. Some studies have looked 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 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) performed a cross-sectional analysis of the association between environmental performance and financial performance (Tobin's  $q$ ). They found evidence of a negative relationship between toxic emissions and firm valuation. However, they recognized that unobserved firm attributes could account for the relationship. To partially rule out unobserved factors, Hart and Ahuja (1996) and Russo and Fouts (1997) evaluated the relationship between changes in environmental performance and changes in financial performance; both found evidence of a strong positive relationship. King and Lenox (2002) argued that such findings may be explained by misspecified models or constructs. Employing a 10-year panel and more conservative specifications, they found no significant relationship between emissions and financial performance. Yet, they did 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) found 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 suggested contingencies for PTBG arguments. Nehrt (1996) argued that the timing of investments determines their financial impact. Exploring the paper industry, he found that early pollution-reducing technology investments by first movers boosted profit growth, while late movers were not able to catch up despite copious investments. Christmann (2000) argued that profitable green can occur only if the firm has the complementary assets to protect its advantage.

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

Summarizing the findings, Margolis and Walsh (2001, 2003) reported evidence of a generally positive relationship between social (including environmental) and financial performance. Olitzsky, Schmidt, and Rynes (2003) criticized their methodology and performed an alternative meta-analysis on 52 studies. Yet, they, too, concluded that environmental performance is positively correlated with financial performance. Moreover, they reported 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 found evidence of a positive relationship. They argued that their meta-analytic technique allowed a better estimate of the economic effect of the relationship, and helped them identify firm and location characteristics 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 discussed progress made by researchers in understanding (a) what might cause managers to systematically overlook profit opportunities and (b) what role external agents might play in stimulating the discovery of such opportunities. By focusing attention on these issues, PTBG scholarship has helped advance understanding of the sources of competitive advantage.

PTBG 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.

PTBG 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 of 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 systematically undervalue 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 gains 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 have suggested 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 B&E 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, p. 97). For anyone interested in environmental issues, “the tragedy of the commons” famously illustrates the need for such institutions. According to Hardin (1968), “the inherent logic” of common ownership “remorselessly” leads to collective ruin. As actors attempt to maximize their own return, they impoverish themselves. Common fields are overrun with sheep, common fisheries are driven to exhaustion, and even common atmospheres are damaged by pollution.

To prevent such common tragedy, Hardin reasoned, a central authority—what Hobbes called a “leviathan”—should control use of the common resource. Attempts by 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 of as rare and new when 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 thought to infuse institutions with

power. A final explanation was previously discussed: scholars remain influenced by the metaphor of “the tragedy of the commons” and its 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 (cf., 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” (cf., Ostrom, Gardner, & Walker, 1994).<sup>3</sup>

#### *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, 2006), and so on. Self-regulatory institutions exist in these settings, but many more occur in industries with no apparent common-pool resource (cf., 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 the firms are (Blacconiere & Patten, 1994).

Dawson and Segerson (2005) proposed that a common risk of government regulation can drive the formation of self-regulatory institutions. They asserted that such institutions forestall government regulation by helping coordinate collective improvement. In concert with this idea, Barnett and King (2006) found 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 reported that after the Bhopal accident, investors punished firms similar to those where an accident had occurred, and they found 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. However, business and environment scholars have argued that for many environmental problems, such unilateral solutions are not feasible (cf., 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 cannot determine by inspection whether the cotton in a pair of trousers was grown in an organic manner or a pound of coffee beans was grown under a natural-forest canopy. For these types of goods, a warranty 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 the 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 of the 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 just presented, 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 (cf.,

Nash & Ehrenfeld, 1997). Corporations, trade associations, international organizations, and stakeholders all have been prime movers behind the creation of one or more examples. Some programs, like the Marine Stewardship Council, were formed by the collaboration of corporations and groups of stakeholders (Reinhardt, 2000). Still international organizations like the International Organization for Standardization (e.g., ISO 14001) created other programs. 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) reported 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 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 leading to the creation of more formal self-regulatory structures. Hoffman (1999) argued 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 also argued that "change can emerge suddenly and unpredictably" (p. 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) argued that such events have greater impact when they violate existing norms and frames.

Research on the conditions needed to allow effective self-regulation has emphasized the importance of monitoring and sanctions. Based on the history of Responsible Care and the Institute of Nuclear Power Operations (INPO), Rees (1997) argued 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 argued, self-regulation is fostered by a central forum for communicating and discussing governance

issues. Furger (1997) argued that overlapping oversight by different institutional actors allowed monitoring of conformance to self-regulatory safety institutions in the maritime shipping industry. He further argued that sanctions and rewards from insurance companies provided incentives to conform with agreed-upon standards. He found that when market pressure and new industry entrants eroded these conditions, self-regulatory institutions lost the power to control behavior. Lenox and Nash (2003) echoed the importance of sanctioning mechanisms and empirically confirmed their effect.

Sanctioning mechanisms—emphasized by the authors just discussed—represent a critical challenge for self-regulatory institutions, because in many countries group-level coercion is illegal. Antitrust regulation designed to prevent anticompetitive behavior also restricts the ability of firms to coordinate sanctions against other firms. In a few cases, self-regulatory structures can call on state government to provide enforcement (cf., 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 environmental 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. Because 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 choice to cooperate to advance their own self-interest.

From the first perspective, self-regulatory institutions represent preconscious or postconscious constraints on strategic behavior. Preconscious 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 decision makers perceive and what choices they consider. Postconscious constraints “directly or indirectly divert design adoption away from the proposed dynamic in transaction cost economics (e.g., comparative efficiency) and toward the dynamic of legitimacy” (Roberts & Greenwood, 1997, p. 355). These constraints “cause actors who do recognize and try to act on their interests to be unable to do so effectively” (Dimaggio, 1988, p. 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 (a) who participates in self-regulatory institutions and (b) how participation influences performance.

*The three pillars.* In search of evidence of pre- and postconscious constraints applied by self-regulatory institutions, several authors have investigated whether cognitive, normative, or coercive pressures influence participation in self-regulatory institutions. Delmas (2002) found 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, p. 91).<sup>4</sup> Several authors found 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) found that participation in ISO 14001 is influenced by pressure from local wealthy stakeholders, civil society, and foreign customers in Europe and Japan. Albuquerque, Bronnenberg, and Corbett (2004) found evidence that national-cultural differences influence the diffusion of ISO 14001 among countries.

Many studies, including several designed to test economic models of institutions, reported 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) found that “patterns of international certification to ISO 14000 are strongly correlated with those to ISO 9000” (p. 339). King and Lenox (2001) found a strong relationship between ISO 9000 adoption and ISO 14000 adoption. Viadiu, Fa, and Saizarbitoria (2006) found that the diffusion pattern of ISO 14000 matches that of ISO 9000. In contrast, using a different diffusion model, Melnyk, Sroufe, and Calantone (2003b) found that adoption of ISO 9000 was not associated with adoption of ISO 14000.

Jiang and Bansal (2003) made 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 concluded 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 found that when tasks were less visible or the outcome of these tasks was more “opaque” to viewers, managers sought to demonstrate their actions by certifying with ISO14000. King, Lenox, and Terlaak (2005) quantitatively tested this idea in a larger setting and found 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 have looked for standard signs of opportunism. These authors predict that programs without strict entry rules fall victim to adverse selection, and programs without means of enforcing compliance will suffer from moral hazard.

King and Lenox (2000) demonstrated 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, Nash, and Ehrenfeld (2000) found evidence consistent with these findings in interviews in 16 firms; they concluded that participation of Responsible Care provided “a poor indicator that any particular standard practices will be followed” (p. 281).

In three important studies, Rivera and de Leon demonstrated that self-regulatory programs with weak enforcement also exhibited telltale signs of strategic opportunism. They showed that participants in a hotel eco-label in Costa Rica did not have superior environmental performance (Rivera & De Leon, 2005). They also found that participants in a self-regulatory program among ski areas (the Sustainable Slopes program) had lower performance than nonmembers (Rivera & de Leon, 2004; Rivera et al., 2006). Moreover, they found 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 have revealed fewer signs of opportunism. Rees (1994) attributed 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<sup>5</sup>—Khanna and Damon (1999) predicted that the governmental oversight on the program would reduce the tendency for firms to free ride. In support of this idea, they found that participants in the program improved their performance more than nonparticipants. Lenox and Nash (2003) compared four self-regulatory programs and claimed that the more successful ones included 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 a calculated equilibrium accurately predicts 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 nonparticipants 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 just discussed, for two programs with weak validation and certification systems, Rivera and de Leon (2004; 2005) found 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 found evidence that certification could be a market signal. Yet, these authors did not find evidence for the simplest signaling story—that certification provides evidence of relatively superior performance. Instead, they argued that certification provides evidence of superior efforts to improve or superior improvement rates. Potoski and Prakash (2005a, b) and Toffel (2004, 2006) found that firms improve their performance after certifying with ISO 14000. King and colleagues (2005) found 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 nonparticipants. 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 United States), scholars have turned their attention to its close cousin—the ISO 9000 Quality Management Standard. Terlaak and King (2006) reported that certification is associated with a moderate increase in production—suggesting that certification helps attract marginal customers. Corbett, Montes-Sancho, and Kirsch (2005) found 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) nonparticipants 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 nonparticipants, 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) found that the creation of the program provided dramatic financial benefits to most firms in the industry, and he found that nonparticipating firms benefited considerably more. Barnett and King (2006) found 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 found evidence that the self-regulatory program reduced this tendency, but benefited nonparticipants 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 provides 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 slowed the rate at which they reduced their emissions. Financial benefits from such a program may suggest credulous stakeholders who 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 to be designed in such a way as to provide conflicting incentives. Darnall and Carmin (2005) suggested that variability in the rules and mechanisms among self-regulatory institutions confuses interpretation of participation. Surveying 61 examples, they found great variation in the purposes, design concepts, and rules. They suggested that if stakeholders (or researchers) lump programs together, they tend to respond inefficiently to the programs. Terlaak (2007) argued that some programs actually contain conflicting design objectives. She argued that some programs hope to provide both useful best-practice guidelines and a means of distinguishing high- and low-performing firms. The problem, she noted, is that the worst firms stand to gain the most from the guidelines, and this can lead to an adverse selection of firms. Such conflicting objectives, she noted, can destroy the usefulness of certification as a means of identifying organizations with better hidden attributes.

#### *Summary and Future Directions*

The management literature has largely neglected the potential for firms to use self-regulatory institutions to solve common problems. This oversight stems in part from a poor fit with existing dominant theories in the literature. It also results in part 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 postconscious 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 suggests that the actors in these institutions are strategic, but to our eyes it also suggests that they are only limitedly so. They appear to guess what others will do and respond to these expectations, but they are also 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, nonetheless grant financial benefits to their participants.

Clearly more research is needed to explore the contradictions, and some efficiency argument may eventually be found to explain these contradictions. However, 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 including 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 free from restriction to particular academic dogma. Therefore, from this narrow ledge between theories, we would like to pose some eccentric questions. We hope you will indulge us.

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 studies just mentioned 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 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 there 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 chapter. 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 chapter, we send two quick postcards about some of the research being done by B&E 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 birdwatcher 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 together a bunch of sharp-eyed people 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 environmental literature. A few unfamiliar "birds" (e.g. regulation-driven innovation, the Porter Hypothesis, examples of self-regulation, and so on) focused the attention of B&E scholars. Once 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 have sent to you in a postcard (from Patagonia, if you will).

Of course, our metaphor breaks down eventually. B&E 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.

The birders in the story all brought with them their own unique expertise, and thus the many-binocular 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 B&E 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 in which 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 preconscious limits on such behavior. The same scholars who 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 nonrational 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 considered 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 institutions as a double-edged weapon that can hide information or reveal it to stakeholders.

Finally, given their contemporaneous observation of important changes, B&E scholars have been unusually focused on time. Organizational studies in general and the RBV in particular 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 set 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 to be cautious in drawing general conclusions from the B&E literature. Our metaphor of the Patagonia picnic table again illustrates 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 PTBG possibilities or attempts at self-regulation has exaggerated or biased the theories and findings reviewed in this chapter. Seeking to understand unexpected innovation or self-regulation, scholars may have inadvertently overstated the importance of both. 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 reevaluate the fundamental roles of business and governing institutions. Business and environmental 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.

### End Notes

1. To facilitate exposition, we will use “environmental performance” to refer to the degree to which firms harm or help the natural environment.
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 is not reviewed here. See Hahn and Stavins (1991) for a complete review.
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.
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.
5. Firms voluntarily pledged to reduce their emissions of 17 key chemicals by 33% and then 50%.

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