BOUNCING BACK: HOW SOCIAL AND ENVIRONMENTAL PRACTICES CONTRIBUTE TO ORGANIZATIONAL RESILIENCE

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ABSTRACT

This study proposes that social and environmental practices help firms develop dynamic capabilities that contribute to the firms' resiliency. We specifically hypothesize that the severity of impact and time to recovery is lower for firms with leading social and environmental practices, and the longer that firms invest in these practices, the better they cope in crises. We test (and support) these hypotheses by examining the impact of the 2008 global financial crisis on a broad sample of Canadian and U.S. firms. Recognizing that social and environmental practices contribute to resilience offers important directions for future research that seeks to assess the outcomes of business sustainability.

Key Words: Social and Environmental Practices, Sustainability, Organizational Resilience, Dynamic Capabilities, Risk

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INTRODUCTION

Organizational scholars have inadvertently derailed the original intent of the World Commission on Environment and Development (WCED) by conceptualizing sustainability as the triple bottom line (Elkington, 1998). When reduced to the three measures of performance characterized by the triple bottom line, most researchers assume that a firm's social and environmental performance should be causally related to its financial performance. Yet, the original document outlining the principles of sustainability states that these '…cannot be treated in isolation from one another' (World Commission on Environment and Development, 1987). It is no wonder that research on the link between sustainability and financial performance has been so elusive (Margolis *et al.*, 2003; Orlitzky *et al.*, 2003).

Before the obscured relationship between these three dimensions of sustainability fully took hold, Hart (1995) realized the critical connection between business and the environment, which prompted him to introduce the element of sustainable development in his work. Sustainable development, which remains 'virtually nonexistent' in research (Hart *et al.*, 2010), maps much more closely with our definition of business sustainability as *the ability of firms to respond to their short-term financial needs without compromising their (or others') ability to meet future needs*. Embracing this definition, business sustainability is about addressing the long-term health of the organization, as opposed to merely focusing on short-term financial performance.

Considering factors external to the organization is a critical requirement of sustainable business (Christmann, 2004). Developing effective social and environmental practices (SEPs) requires managers to engage customers, regulators, and other stakeholders, which may help them sense and seize (capitalize on) new opportunities and threats and reconfigure their resources to

adjust to their external environment. Looking at environmental certification standards, for instance, Christmann *et al.* (2006) show that firms select the appropriate level of compliance based on their customers' profiles. In essence, engaging stakeholders helps firms create fit with their external environment by helping them sense, seize, and reconfigure to exploit changes and opportunities. The competitive advantage that arises in this process may not be reflected by the firm's short-term profitability, but rather through a more comprehensive set of properties reflected in the concept of resilience.

Resilience is a growing concern for business. Major economy-wide turbulence, such as the technology bubble burst at the turn of the century followed by the global financial crisis less than a decade later, is increasingly common and disruptive for firms. Not all firms, however, experience these crises in the same way. Some organizations learn from crises (Madsen *et al.*, 2010), recovering quickly and building strength, whereas others collapse under the weight of external pressures. These taxing events contribute to financial losses for most firms, but there are likely differences in each firm's resiliency – in other words, their ability to survive these exogenous shocks and return to prior performance levels.

Realizing that research on SEPs needs to extend beyond immediate financial outcomes, we seek to answer: *How do a firm's social and environmental practices affect its resilience?* Resilience is measured using two dependent variables: time to recovery and the severity of impact following an exogenous shock. By operationalizing organizational resilience as our dependent variable, this work advances the original conceptualization of sustainability by the WCED. This paper contributes to theory by describing the sensing, seizing, and reconfiguring processes that derive from SEPs, which develop dynamic capabilities that improve the interface between the firm and its external environment.

THEORY AND HYPOTHESES

Connecting resilience with social and environmental practices

Sustainable development is most commonly defined as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987). Through this definition, the WCED recognized that organizations operate in social, environmental, and economic systems. Sustainability itself is a dynamic state in which these systems are in balance. Management scholars, however, conceptualized the WCED's description of sustainable development as the triple bottom line (Elkington, 1998). Sustainable firms became those that were able to manage their social, environmental, and financial performance, and much subsequent research became focused on exploring whether improved social and environmental performance leads to better financial performance rather than on examining the interconnections between these three foundations.

Social and environmental practices (SEPs) are those practices that firms use to manage their social and natural environments, and typically include stakeholder engagement and environmental management. Stakeholder engagement encompasses the activities organizations take to involve stakeholders in decision-making (Sharma *et al.*, 2004). Stakeholders may have a strong stake in the organization, such as customers and suppliers, or be more peripheral, known as fringe stakeholders (Hart *et al.*, 2004). In either case, though more interaction is not always better (Greenwood, 2007), stakeholders present a unique source of information for firms and therefore serve as a value asset if managed properly.

In regard to environmental management, Christmann (2000) notes that 'firms can improve their competitive positions and at the same time reduce the negative effects of their

activities on the natural environment by implementing certain best practices of environmental management.' Firms can manage the environment in a number of ways, such as monitoring and reporting emissions, setting goals and targets, and changing their physical operations, all of which require some level of managerial decision making and action.

Organizational resilience — the missing link between SEPs and risk

There is an unmistakeable strategic perspective in prior approaches to sustainability, which assumes the adoption of activities at the interface of society, the environment, and the economy can create value. 'Creating value' has become the main pillar for SEPs, being both the motivation for and outcome of environmental and social responsibility (Margolis *et al.*, 2003). It is no wonder that countless scholars have attempted to unpack the relationship between SEPs and financial performance. The link, however, remains unclear (Griffin *et al.*, 1997; Margolis *et al.*, 2007; Orlitzky *et al.*, 2003; Wu, 2006), which likely means that the relationships are non-linear, non-monotonic, the cause and effect are not temporally proximate, and/or that the model is underspecified (Gao *et al.*, 2013).

While evidence on the relationship between SEPs and financial performance is mixed, one area of study that has produced more consistent results is the relationship between risk and SEPs. Reduced risk has been identified as an outcome of social and environmental responsibility (Bansal *et al.*, 2004; Orlitzky *et al.*, 2001; Sharfman *et al.*, 2008). However, the relationship between SEPs and risk requires further development. With risk positioned as an outcome or dependent variable, the mechanism by which SEPs act on risk has not yet been fully conceptualized. We simply understand that SEPs affect risk, but the reasons why they do are not fully explored.

Bansal and Clelland (2004), for example, found that environmentally legitimate firms experience less unsystematic risk than illegitimate firms. Their findings, however do not tell us what organizations are to do when the risk is macroeconomic and exogenous to the firm (i.e., systematic). For instance, do the SEPs of stakeholder engagement and environmental management mitigate risk in times of widespread economic hardship, such as the 2008 global financial crisis (GFC)? Certainly firms ought to care about unsystematic risk (Lubatkin *et al.*, 1994), but they should also know how to manage systematic or total risk (Lubatkin *et al.*, 1989). Furthermore, with an unclear understanding of why SEPs affect firm risk, these studies fail to shed light on how risk can be managed using such practices.

We argue that the mechanism by which SEPs influence risk is resilience, which can be defined as 'the capacity of a system to absorb disturbance and reorganize while undergoing change so as to retain essentially the same function, structure, identity, and feedbacks' (Walker *et al.*, 2004). A resilient organization can persist despite exogenous disruptions (Gunderson *et al.*, 2002). Resilience has been used extensively in ecological research to explain how ecosystems and organisms are affected by exogenous shocks (Holling, 2001; Walker *et al.*, 2004), such as pollutants in waterways and budworms in forests, and how humans can purposefully manage these systems to reduce vulnerability and volatility. Thus, resilience may serve as a useful path in exploring the relationship between resilience and risk.

The first step in positioning resilience as the mechanism between SEPs and risk requires discriminating resilience from profitability. At its core, profitability centres on a simple relationship, the difference between costs and revenues. However, this relationship is assumed to occur in the same time period, so profitability is subject to considerable volatility across time periods (Wiggins *et al.*, 2002). Furthermore, public firms are obliged to report quarterly profits,

which may lead to short-term prioritizing. In contrast, resilience endures across time periods and is therefore less easily manipulated, which contrasts with the ease of managing profitability measures (e.g., Burgstahler *et al.*, 2006).

Building on the understanding that profitability is somewhat unstable, even fluctuating widely at times, resilience in contrast is 'sticky'. In this sense, resilience shares some characteristics of path dependency in that it is resistant to change and becomes locked in through 'a steady accumulation of small differences' (Garud *et al.*, 2001). As is the case with path dependent processes, organizational resilience becomes 'magnified by positive feedback' (Powell, 1991), meaning that the survival of each exogenous shock will increase the resilience of firms and their ability to survive future shocks. Ultimately, then, where financial performance, as measured by profitability, is relatively unstable and independent of an organization's historical performance, resilience is a slowly accumulating outcome that evolves with time. What follows then is that resilience should help firms manage risk in the form of reduced volatility.

Having taken an intial step in potentially understanding the relationship between SEPs and risk through resilience, the bulk of this paper seeks to address the connection between SEPs and resilience. The two related activities of stakeholder engagement and environmental management are focused on to illustrate how SEPs build resilience. Stakeholder engagement and environmental management may help firms create and maintain fit with their external environments through the critical processes of sensing, seizing, and reconfiguring, which are at the source of dynamic capabilities (Teece, 2007). That is, SEPs help align a firm with its external environment, which supports organizational resilience. This relationship is illustrated in Figure 1.

'Insert Figure 1 here'

The dependent variable resilience is operationalized two ways. *Time to recovery* assesses how long it takes for an organization to recover from an exogenous shock (see Pimm, 1992) and *severity of impact* measures the magnitude of the initial impact. Resilient organizations should experience smaller disturbances following an exogenous shock and more quickly overcome setbacks. This approach successfully captures 'both the ability of a system to persist despite disruptions and the ability to regenerate and maintain existing organization' (Gunderson *et al.*, 2002).

Sustainability and resilience in the context of the global financial crisis

We test our arguments in the specific context of the 2008 global financial crisis (GFC) in which the global economy experienced an exogenous shock. Although much has been written about the cause of the crisis, an area of consensus is that it was not a natural disaster, but the result of many stakeholders' combined activities (Levin and Coburn, 2011). Some problems surfaced earlier than others with the first tangible sign of the imminent crisis appearing in the summer of 2007 when U.S. housing prices peaked (Dwyer *et al.*, 2009). Anecdotal reports suggest that the GFC is considered to have had the greatest economic impact on global markets since the Great Depression, and that markets had not fully recovered at the time this paper was written. Given that consumer spending was so heavily crippled, firms from all industries and sectors in many countries were negatively impacted.

Given the widespread nature of this particular crisis, it serves as a useful context to test our proposition that SEPs build resilience. Firms that engaged in SEPs should have been more adaptive to their environment and, therefore, bounced back more quickly from the GFC than their peers. Given the two ways in which we operationalize organizational resilience, we ask — 1) How do SEPs affect a firm's time to recovery from an external shock?; and 2) How do SEPs

insulate a firm from external shocks? Using two measures of our dependent variable allows us to better answer our research question — How do a firm's social and environmental practices affect its resilience? This shifts the focus of SEP research from a parochial financial performance perspective to an interconnected resilience-based approach.

SEPs and time to recovery

Fast recoveries from shocks, such as the GFC, are crucial as longer recovery periods can thwart an organization's ability to thrive and its potential to survive. Recovery, however, can be impeded when firms are unequipped to cope with changing environments, which underscores the importance of dynamic capabilities. First, firms that are closely tied to their environments are better able to identify and interpret cues (Teece, 2007). The faster firms can sense impending doom (i.e., the less time it takes to travel from identification to interpretation), the faster they will be able to respond to shocks. Being responsive to the needs of and cues from stakeholders may enable better environmental sensing.

Sensing depends on a creative process that is learned over time (Zahra *et al.*, 2006) and embedded in organizational decision makers (Augier *et al.*, 2009). Following the 2008 GFC, various companies re-focused their attention and efforts on managing internal operations and reducing costs, with many organizations laying off a significant percentage of their workforce, a less common response of firms that engage in SEPs. Widespread layoffs often have detrimental effects for firms (Gittell *et al.*, 2006) and, in this case, may have undermined the responsiveness of firms to the needs of and cues from stakeholders, such as employees, regulators, and suppliers, and hence reduced their sensing capabilities. While the ability to spot new threats and opportunities is critical to recovering from a widespread crisis, firms that overlooked their

stakeholders through increased layoffs or other means (e.g., simply looking inward to solve the problem) may have decreased this ability and lengthened their recovery times.

Second, firms have to not only sense opportunities and threats, but also formulate a response and act, either by creating, modifying, or extending their resource base (Helfat *et al.*, 2007). In the context of the 2008 GFC, stakeholders also played a role in helping some firms capitalize on opportunities. Realizing that stakeholders offer critical resources on which firms depend (Frooman, 1999) and that strong stakeholder ties can benefit firms as competition increases (Berman *et al.*, 1999; Ogden *et al.*, 1999), we can see how strong stakeholder relationships contribute to recovery.

In the days following the crisis, many regulations were passed and bailouts arranged. Evidently, in this case, relationships with regulators and government officials rose in importance as companies tried to secure financial assistance along with more favourable policies. In addition, strong ties with a more general stakeholder community mattered for firms trying to avoid indirect punitive costs (Sharma *et al.*, 2005) and perhaps swing new regulations further in their favour (e.g., Sine *et al.*, 2009). In regard to suppliers, when credit policies tightened following the crisis, strong firm-to-firm relationships would sometimes surface creative solutions to help reduce the impacts of failed suppliers. Taken together, strong stakeholder relationships provided firms with more seizing and reconfiguring opportunities.

Building on these arguments, we also see how environmental management practices may have played a role in helping firms recover from the 2008 GFC. When the economic landscape began to erode, most firms' access to new resources was restricted (either due to failed suppliers, credit downgrades, or tighter credit policies), requiring them to do more with less. Reconfiguring their existing resource base was a typical, if not the only, solution. Understanding that

environmental management practices were already forcing some firms to spot valuable asset complementarities before the crisis took hold (Shrivastava, 1995), some firms may have already honed the skills and knowledge required to recover from the crisis. For instance, a firm that was capable of cutting its energy consumption in half while maintaining its operations would certainly outperform its competitors who lacked this same ability. The same can be said for pollution prevention, water use, or other environmental management practices. Therefore, we suggest that firms with strengths in stakeholder engagement and environmental management practices recovered more quickly from the effects of the GFC.

> *Hypothesis 1a. SEP leaders experienced a shorter time to recovery from the 2008 GFC than SEP laggards.*

SEPs and severity of impact

Resilience is not fully captured by recovery time as this metric does not consider the magnitude of initial impact. Instead, severity of impact serves as a second measure of resilience. In addition to recovering from shocks, firms can dampen the effects of shocks before they occur by identifying them (sensing) and building an organizational structure that absorbs them (seizing and reconfiguring). Previously, we hypothesized that SEPs quicken a firm's sensing, seizing, and reconfiguring capabilities following a shock, thereby shortening recovery times. However, SEPs are equally as vital before shocks take place.

Teece (2007) writes that, 'the search activities that are relevant to sensing include information about what's going on in the business ecosystem.' Providing an answer to how firms can find out 'what's going on,' Hart *et al.* (2004) find that fringe stakeholders express unique signals that help firms manage disruptive change via increased awareness of cues.

How stakeholders improve the sensing process is illustrated through a case of predatory lending signals in the GFC. Some accounts attest that predatory lending in the housing market

was the earliest signal of the GFC. These practices started in markets with slack lending policies, such as Ohio, and led to hastier rises in mortgage defaults and foreclosures. If a company had local employees, business offices, suppliers, creditors, and so on in Ohio, then it may have received some of the earliest signals regarding the forthcoming crisis. Sensing these signals may have allowed a company to prepare for the subsequent impact via means such as portfolio divestiture, before the entire U.S. housing market slumped years later. Interpreting these specialized local signals would be further aided if they were echoed by additional stakeholders.

Looking beyond sensing and into seizing and reconfiguring with environmental management practices, it becomes apparent that SEPs may prepare firms to absorb shocks before they occur. One core attribute of environmental management involves reducing use of energy and materials through product design (Shrivastava, 1995). When exogenous shocks place a firm's external environment under stress (e.g., less available resources, tighter credit policies, higher input costs), maintaining low material and energy requirements can help build organizational resilience by reducing that firm's dependency on those strained external variables. For example, oil prices reached record levels immediately preceding the 2008 GFC. Firms that were less dependent on oil (i.e., those that perhaps satisfied their energy needs through internal generation or simply consumed less energy) were already better positioned before the crisis materialized due to their reduced exposure to overinflated oil prices. Ecologists have long recognized how over dependent systems become vulnerable to shocks and disturbances (Walker *et al.*, 2006). We suggest that strengths in SEPs enable firms to better absorb the impacts of exogenous shocks, by sensing early warning signals and reducing resource dependencies.

> *Hypothesis 1b. SEP leaders experienced less severe impacts from the 2008 GFC than SEP laggards.*

Benefiting from SEPs over time

Firms are not innately granted the capabilities to sense and seize opportunities and reconfigure their resource base in purposeful ways. Rather, firms learn and build these capabilities over time through mistakes, repeated trials, and new innovations (Zahra *et al.*, 2002). Pollution prevention, for instance, is an attribute of environmental management (Shrivastava, 1995) that, on one hand, appears to be merely the reduction of physical resources in production cycles. However, on the other, such reductions require new ways of operating and SEPs that involve training, innovation, and novel resource configurations, all of which may build dynamic capabilities.

In the years and decades leading up to the 2008 GFC pollution prevention systems were constantly changing as new technological possibilities arose and environmental regulations were updated. Seeking to reduce pollution, some firms would alter their operations, perhaps leveraging, creating, accessing, and releasing new and existing resources (Danneels, 2011). In Canada's oil sands several companies made considerable investments in new technologies to manage toxic by-products (e.g., tailings) and air pollutants produced during the oil production process. Over time, these iterative investments became path dependent, leading to self-reinforcing 'increasing returns' (e.g., Burgelman, 2002) that led some companies to develop competitive advantages in certain areas. For example, before the GFC materialized, some oil sands firms developed technologies that reduced the pollution emitted during oil production, which allowed them to reduce their carbon costs and perhaps even profit by selling excess carbon credits. Furthermore, with expectations that the price of carbon credits will rise

significantly in the future (in response to stiffer regulations) these environmental practices further build resilience by reducing the impact of external carbon prices.

Whereas path dependent investments in environmental management practices generate direct benefits for firms, they also lead to a more general set of dynamic capabilities (Schreyögg *et al.*, 2007) as firms build on their prior experiences (King *et al.*, 2002; Vergne *et al.*, 2011) and strengths (Helfat, 1997; Wernerfelt, 2006). As 'increasing returns' set in, a firm that is proficient in sensing new opportunities should become even better in this regard, with time. Not surprisingly then, Christensen *et al.* (2000) found that the earlier that firms invested in environmental management practices, the greater their returns. Thus, given that SEPs sharpen a firm's dynamic capabilities over time (Ethiraj *et al.*, 2005; Zahra *et al.*, 2006), increasing returns should augment path dependency and further heighten SEPs as a source for dynamic capabilities. In other words, once started, the process becomes self-perpetuating.

Stakeholders impact firms both positively and negatively, and affect how organizations respond to external pressures (Christmann, 2004; Rowley, 1997). In addition to directly strengthening firms' sensing, seizing, and reconfiguring capabilities, investments made in SEPs before the 2008 GFC may have also indirectly enhanced these capabilities through stakeholder ties. For example, environmentally sensitive industries are regular targets of activists who can impose both direct and indirect costs on firms (Eesley and Lenox, 2006). Investments in environmental management practices leading up to the crisis may have reduced activist pressures for some companies, and therefore not only reduced the costs associated with dealing with these groups, but also freed up human capital to cope with the impending crisis. Comparing a company that had to

commit resources to handle stakeholder scrutiny during a time of economic hardship to one that was free to operate uninterrupted, it becomes evident that strong relationships with external stakeholders better positioned some firms to sense, prepare for, and deal with the crisis. Similarly, internal stakeholder ties may also support these capabilities. Research on 9/11 shows that retaining employees allowed some airlines to recover more quickly following the crisis than those with more layoffs (Gittell *et al.*, 2006).

Investments in environmental management practices may have also created a more favourable regulatory environment, which is an influential driver of firm behaviour in Canada[1] (Sharma and Henriques, 2005). Therefore, as the GFC unfolded, some firms were able to allocate more resources than others to cope with the crisis since they were not weighed down by regulatory concerns. In terms of internal stakeholders, Enz and Siguaw (1999) show that investments in environmental practices can increase employee morale and satisfaction. Knowing employees are central to sensing, seizing, and reconfiguring processes (Augier and Teece, 2009), such investments would have helped firms in managing the crisis. Taken together, stakeholder engagement and environmental management activities should lead to the development of a path dependent dynamic capability building process, whereby over time, increasing returns lead to further enhancements in sensing, seizing, and reconfiguring capabilities. We suggest therefore, that longer duration SEPs reduce recovery time from and lessen impacts of exogenous shocks.

> *Hypothesis 2a. The longer that firms were SEP leaders, the shorter their time to recovery from the 2008 GFC.*

[1] In Canada directors and company executives can face personal liability for environmental violations, which supports different findings than in the U.S. context (see Kassinis & Vafeas, 2002)

Hypothesis 2b. The longer that firms were SEP leaders, the less severe impacts they experienced from the 2008 GFC.

DATA AND METHODS

We chose the GFC to test our hypotheses because we required a shock that impacted firms (regardless of industry and size and any other firm-specific variables) severely enough to discern between varying degrees of failure and recovery. Although the events triggering the crisis originated in the U.S., they affected stock markets, housing markets, and major companies, across the globe.

The evolution of the 2008 global financial crisis

Erkens, Hung and Matos (2012) have classified the GFC into four categories: the 'Prelude' ran from at least early 2007 to August 9, 2007; the 'Main Act' took place between August 9, 2007 and September 16, 2008; the 'Climax' occurred between September 16, 2008 and sometime early in 2009; and the 'Denouement' signifies the ongoing effects of the crisis that still continue to the time that their paper, and this paper, was written. More specifically, Dwyer *et al.* (2009) note that on September 15, 2008 and September 16, 2008, respectively, Lehman Brothers filed for bankruptcy and the U.S. Federal Reserve loaned $85 billion to AIG. These two events support the date of transition from the Main Act to the Climax. With this in mind, we consider September 17, 2008 as the starting date of the crisis, since the announcements made on September 16, 2008 took place overnight, when the U.S. stock markets were closed.

Sample

The sample includes all firms listed on at least one of the Standard & Poor's (S&P) 500 index in 2011, or the North American Dow Jones Sustainability Index (DJSI) between 2005 and 2011.The former index provided 500 firms that range in their commitment to SEPs, while the latter consists of only firms that were categorized as social and environmental leaders.

The S&P 500 was first published in 1957 and is widely regarded as one of the best measures of the large cap U.S. equities market. Five hundred leading companies from multiple major industries make up the index, which covers roughly 75 percent of all listed U.S. equities. Launched in 1999, the Dow Jones Sustainability Indexes are the longest running benchmarks that cover the sustainability performance of some of the world's largest firms. Covering both Canadian- and U.S.-based firms, the North American equivalent started in 2005 and provides a binary output of SEP leaders and laggards – companies that meet the criteria are included on the index (leaders) while those that do not are excluded (laggards).

We compiled our sample per the following steps. First, data was collected on all firms listed on the DJSI between 2005 and 2011. This included 215 unique companies. After accounting for acquisitions and bankruptcies, 194 unique firms remained. Next, we collected data on all firms listed on the S&P 500 in 2011 and deleted those that were listed on both the DJSI in any year between 2005 and 2011 (step one) and the S&P 500 in 2011 (step two). After completing these steps, 502 unique firms remained, 194 of which had at least been listed on the DJSI for a single year (i.e., they had invested at least a minimum level in SEPs during those years).

To test the first two hypotheses, firms that were listed on the DJSI for all three years from 2005 through to 2007 were classified as SEP leaders (these firms had consistently invested in SEPs during this timeframe). Firms that were not listed on the index for all three of these years were classified as SEP laggards. A third group consisted of firms that were not listed on the DJSI in all three years (2005, 2006, 2007) but were listed in at least one year (i.e., they had invested at least a minimum level in SEPs during those years). To increase the robustness of our results, we

excluded this final group in testing hypotheses 1a and 1b which left us with a comparison between only SEP leaders and laggards.

We received electronic data via email pertaining to the companies listed on the DJSI, directly from the DJSI organization. All other data, including the names of the companies listed on the S&P 500 and stock data for each firm in the sample came from Datastream. Datastream provides historical financial performance and key indicators for all companies listed on major North American stock indexes. Weekly stock data were used for all 502 firms, for the weeks between September 16, 2008 and January 1, 2012.

The firms represented in our sample range in total assets from approximately USD 1.15 million to USD 2.27 billion, for 2011, with the average being USD 59.36 million. In total, ten industries are represented with Financials being the largest (17.1%), followed by Consumer Services (15.3%), Industrials (14.5%), and Technology and Consumer Goods (each 10.6%). The smallest industry representation is for Telecommunications (2.2%). Firms that were listed on the DJSI for at least one year (36.5%) spent an average time of 4.3 years on the index, with 61 of these firms having remained on the index for all seven years that our data spanned.

'Insert Table 1 here'

Dependent variables

In our study, we identified the two dependent variables – *time to recovery* assesses how long it takes for organizations to recover from exogenous shocks and *severity of impact* measures the magnitude of the initial impact to organizations, thereby capturing their ability to absorb exogenous shocks.

Time to recovery. From September 16, 2008 onward, we calculated each firm's time to recovery by determining the number of weeks it took for the weekly average stock price to reach

its closing price on September 16, 2008. The average time to recovery was approximately 67 weeks. 107 firms' stock prices did not reach pre-crisis levels (September 16, 2008 closing price) before January 1, 2012. We decided to exclude these observations from this analysis as any other number would have been arbitrary; however, we conducted robustness checks, which are explained below, to ensure that eliminating these firms didn't bias our results. Post elimination, there are 395 observations corresponding to H1a and H2a.

Severity of impact. We calculated the severity of impact by finding the lowest point that a particular firm's stock price fell in the 33 weeks following September 16, 2008. We bounded this window to 33 weeks (roughly seven and a half months) to reduce the possibility that fluctuations became attributable to other events. Therefore, the beginning date included the closing price on September 16, 2008 and the ending date concluded with the weekly average stock price for the week of May 1, 2009. Gittell *et al.* (2006) used a similar approach to gauge the resilience of airline companies following September 11, 2001.

Of the 107 firms that had not yet recovered from the crisis, as of January 1, 2012, 40 were classified as SEP leaders. In the 33 weeks following September 16, 2008, the average loss for this group was 61.65 percent, while the SEP laggards' cohort had an average loss of 63.83 percent. At the beginning of 2012, when our observation window ends, the average loss for the entire group of non-recovery firms (both leaders and laggards) was 42.41 percent. We included these 107 observations in the analysis of severity of impact (H1b and H2b), but not time to recovery (H1a and H2a).

Independent variables

Our first set of hypotheses suggests that SEP leaders recover more quickly from the GFC than SEP laggards. To test this, we discriminated between SEP leaders and laggards. Of the three

major indexes available for measuring such practices, the DJSI is the only one that provides a clear cut-off between these two groups. Therefore, by using the DJSI, we eliminated any problems of subjectivity caused by establishing some arbitrary cut-off point between SEP leaders and laggards. This problem would have arisen if we had used the Kinder, Lydenberg, Domini (KLD) index, a qualified alternative index for measuring sustainability performance (Sharfman, 1996).

Previous work using KLD has had to assign differential category weightings, based on authors' opinions about the importance of each category (Graves *et al.*, 1994), in order to rank each company in terms of SEPs. Taking this approach, however, has shortcomings as such a universal ranking system cannot be made (Mitchell *et al.*, 1997), as SEPs do not lend themselves to relative weightings. For example, can we accord waste water reduction higher importance than workplace diversity? Using the DJSI allows us to accommodate equifinality into the measurement of SEPs. That is, by incorporating the interrelationship among all domains of sustainability and by not assigning a score to each or computing a composite score, the DJSI approach of all-in or all-out is consistent with our approach.

In line with other sustainability indexes, the DJSI gauges corporate sustainability in three major areas: financial, environmental, and social performance. The DJSI measures SEPs using a 73-page questionnaire, as well as a Media and Stakeholder Analysis (MSA) that focuses on external press surrounding each company. Question 2.3.5 EP on the questionnaire, for example, asks companies to report on water usage goals and how they performed in regard to these over a number of years. In summary, the measures used by the DJSI are similar to KLD, but allowed us a validated way to discern between SEP leaders and laggards.

The measure of SEPs was extended to test the second set of hypotheses. Here the independent variable became the total number of years that a firm was listed on the DJSI between 2005 and 2011. Therefore, a firm that had been engaging in SEPs for longer may have been listed on the index for multiple years whereas others may have appeared on the index for only one year, or not at all. The maximum score a firm could receive was seven and the minimum was zero.

Control variables

We incorporated the following controls into our study: average total assets, debt-to-equity ratio, return on assets, current ratio, and industry code. We controlled for firm size using *average total assets,* which is a three-year average (2005 through 2007) of each firm's total assets. Larger firms, in comparison to their smaller counterparts, should generally absorb shocks better because the impact can be dispersed over a larger base of resources. Market capitalization was not used to control for size as this metric relates directly to stock prices, which is tied to the dependent variable. Offering stability across the sample window, total assets is also less variable than other measures of size (e.g., sales or number of employees).

Next, leverage was controlled for using *debt-to-equity*. A higher debt-to-equity ratio indicates a greater proportion of financing from debt, which typically results in more volatile earnings due to the costs of borrowing (interest) and, consequently, discounted valuations. In response to exogenous shocks, firms with greater debt loads will generally undergo more severe sways in stock prices. *Return on assets (ROA)* was the third control as profitability is the core determinant of a firm's stock price. ROA controlled for any profit related factors that may have affected a firm's stock price.

Fourth, the *current ratio* allowed us to control for variances in organizational slack. Firms firms with more short-term assets (cash, inventory, receivables) are better equipped to meet their short-term obligations as they come due. If a firm's current liabilities exceed its current assets (i.e., current ratio below one) and a shock arises where the firm is put under pressure to pay its creditors, then unusual strain would be placed on the organization, which may result in lower stock price valuations and, possibly, bankruptcy. We took the natural logarithm of average total assets, debt-to-equity, and current ratios to adjust for skewness in these variables.

Our final control involved industry codes as many of the other controls, in addition to the two dependent variables, are industry dependent. Generally, acceptable debt loads and liquidity positions, for example, vary based on industry. Industry categories also influence recovery trajectories as industries vary in terms of cyclicality. For instance, at the bottom of the 2008 financial cycle some investment analysts voiced their preference for consumer goods and services companies as they were projected to recover more quickly than firms in other industries. Similarly, defensive stocks such as utilities companies typically experienced the smallest losses.

ANALYSES AND RESULTS

We used regression analysis to test all four hypotheses by assessing the influence of the main effects and control variables on time to recovery and the severity of impact. We evaluated the stock price movements of all firms in our sample from September 16, 2008 to January 1, 2012. Table 2 reports the means, standard deviations, and correlation coefficients for the dependent, independent, and control variables. Table 3 reports the results from the four regression models. All of the control variables are included in each model. The coefficients for all four main effects are in the direction hypothesized. We find support for our first hypothesis (Model 1), which states that SEP leaders will recover more quickly from shocks than SEP laggards. On average,

SEP leaders recovered 12 weeks (18%) faster than SEP laggards. This difference is substantial given that the average recovery time for the entire sample is 67 weeks.

We find moderate support for Hypothesis 1b (Model 2), which predicts that SEP leaders experience less severe losses following exogenous shocks than SEP laggards ($p < .10$). The coefficients in Model 2 explain roughly 30 percent of the variance in stock price losses following the crisis. Together, these two models support the argument that SEP leaders were more resilient in the wake of the 2008 GFC.

The next model tested whether the number of years that a firm engaged in SEPs impacted organizational resilience. Building on the reasoning from H1a and H1b, the overarching expectation was that engaging in SEPs over a longer period of time would develop the path dependent dynamic capabilities that build resilience. Both in terms of time to recovery and severity of impact, Models 3 and 4 support our predictions per Hypothesis 2a and 2b, respectively. The duration of SEPs has a direct positive relationship with firm resilience. In summary, the evidence from testing our hypotheses indicate that SEPs are positively related with organizational resilience. Specifically, in regard to the 2008 GFC, we find that firms engaging in SEPs had a shorter time to recovery and reduced severity of impact, and that duration of SEPs was inversely related to recovery time and impact severity

'Insert Table 2 & Table 3 here'

Robustness testing

To ensure the robustness of our analysis, we specified several alternative models. First, in testing all hypotheses, we assigned to all firms that did not recover by January 1, 2012 – the final day of our analysis – the maximum number of weeks as their recovery time (171 weeks). After doing this, the results held for all four hypotheses with no qualitative differences. Next, we specified

robust standard errors to control for potential heteroskedasticity. This helped us provide a more conservative test of our hypotheses (White, 1980). Finally, we ran collinearity diagnostics to check for potential multicollinearity in our results. Condition numbers were below the threshold of 30, which indicates that collinearity was not likely to be a significant problem (Belsley *et al.*, 2004).

DISCUSSION AND CONCLUSION

In this article, we explored the relationship between SEPs and resilience. We posited that SEPs help firms build greater resilience to shocks because they can better sense and seize threats and opportunities relative to competitors, and can reconfigure their resources meaningfully in the face of a crisis. Together, these capabilities help firms manage the interface between the firm and its wider organizational environment, which includes the economic, social, and natural environments.

Using longitudinal data, we found that SEP leaders exhibit greater resilience than their peers; they recover more quickly and experience losses of smaller magnitude in the months and years following the 2008 GFC. The GFC provided a natural experiment in which to test our theory, but we believe that this theory can be applied to a much wider range of exogenous shocks.

Exploring two facets of resilience further supported the assertion that SEPs foster resilience and reduce a firm's risk. The study suggests that SEPs allow firms to develop their sensing, seizing, and reconfiguring capabilities over time (Ethiraj *et al.*, 2005; Zahra *et al.*, 2006), and that firms experience increasing returns as they invest more in developing these capabilities. This stage of our work builds on Christensen and Cheney's (2000) findings by indicating that continued investments in SEPs, and not solely early investments, are beneficial to

firms. In finding that SEPs are reflected in greater resilience, the findings provide initial evidence that SEPs may serve as a source for dynamic capabilities that contribute to firm success beyond financial performance.

By grounding SEPs in resilience, this paper takes a different approach from that of the previous research that largely seeks to connect sustainability and financial performance (Griffin *et al.*, 1997; Margolis *et al.*, 2007; Orlitzky *et al.*, 2003; Wu, 2006). Instead, this paper built on the clearer relationship between SEPs and risk (Bansal *et al.*, 2004; Goss *et al.*, 2011; Sharfman *et al.*, 2008) by proposing resilience as the mechanism by which SEPs and risk are connected. This approach allowed us to focus not purely on the classic financial metrics that can sometimes prohibit scholars from drawing meaningful conclusions about what competitive advantages SEPs entertain, while still continuing our focus on the foundation of strategy.

In addition to pushing the boundaries of SEP research, this paper also contributes to the study of dynamic capabilities. We argued that SEPs can serve as a source for dynamic capabilities. By investing in SEPs, firms enhance their abilities to sense and seize needs and opportunities as well as reconfigure their resource base, which ultimately helps them build fit with the external environment. By shifting the lens to dynamic capabilities, we bring into view the role of SEPs in embedding the firm in its external environment, which should ultimately reduce firm risk. Considering that SEPs may be connected to firm risk through resilience may help managers make better informed decisions regarding their investments in SEPs and further promote the adoption of these practices in business. This ultimately shifts the conversation from the well explored, yet unclear link between SEPs and financial performance to one of resilience and risk. A manager looking to reduce the long-term variability of his or her firm can do this by investing in SEPs.

Focusing on the development of SEPs over time, this paper answers the call for more longitudinal dynamic capability studies (Easterby-Smith *et al.*, 2009). This methodological approach helped provide the means to answer why all firms do not realize the benefits brought forth by SEPs. Not all dynamic capabilities lead to immediate results because capability development is time-dependent. By exploring SEPs over time, our work illustrated the requirement for firms to embrace long-term strategies if the benefits (resilience) of SEPs are to be realized. As Wang and Ahmed (2007) contest, 'effective capability development requires that firms maintain a consistent long-term vision and have long-term performance at heart.'

In closing, we offer several avenues for future research. While our conclusions support King's (1995) suppositions that ecology and environmental connectedness promote organizational survival through an ability to avoid surprises, future research may profit from studying the ongoing effects of the 'surprises' that do arise. Where this study captured how long it took firms to fully recover, it would also be helpful to understand how the effects of these shocks materialized while recovery was underway. For example, does an initial shock create swings (i.e., ups-and-downs) or is recovery typically a consistent, linear path? Further, how do these findings differ for SEP leaders and SEP laggards? Future studies could also expand the window of observation to identify the characteristics that affect the number of shocks that a firm experiences over a much longer horizon. While using the GFC as a natural exogenous shock for this context was appropriate, including multiple shocks could also serve as a fruitful opportunity. Related to the preceding point, another promising idea is to parcel out the differences between endogenous and exogenous shocks. Where we focused on exogenous shocks, another avenue is to observe how the effects of internally generated shocks, such as earnings surprises, are influenced by a firm's SEPs. Finally, future research should strive to push past the widely

explored link between financial profitability and social and environmental performance to uncover additional consequences of SEPs. Resilience serves as one alternative dependent variable for doing this.

Business sustainability has found fertile ground in strategic management studies in which to thrive. A central debate in this realm is whether sustainability should be seen through the eyes of strategy, or whether it calls for new ways of seeing strategy (Russo *et al.*, 2012). In this paper, we provide a link between these two approaches by leveraging the theory that grounds dynamic capabilities. In doing so, we hope we can advance the integration of business sustainability with business strategy, so that we can move towards the vision outlined originally by the WCED.

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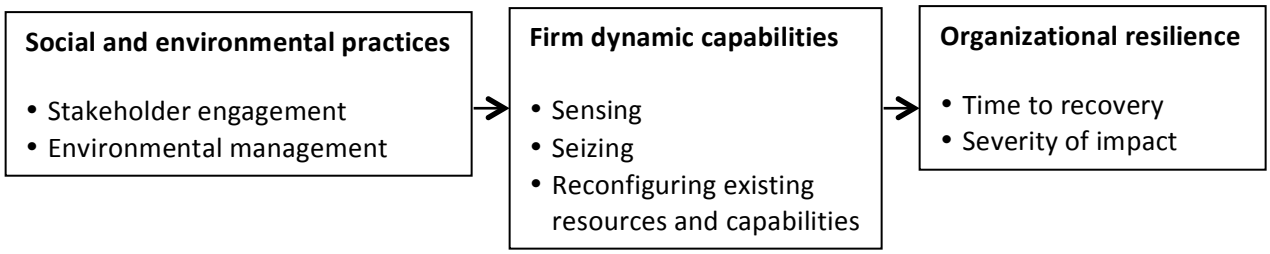

Figure 1 – The relationship between SEPs and organizational resilience

Table 1 - Descriptive statistics

Variable	Frequency	Mean
DJSI		
2005	99	
2006	105	
2007	111	
2008	121	
2009	134	
2010	133	
2011	140	
Years on DJSI (entire sample)		1.58
Years on DJSI (DJSI firms only)		4.37
Fundamentals		
3-Year total assets (‘000,000)		44.60
2007 Debt-to-equity		1.91
2007 Current ratio		1.44
2007 Return-on-assets		0.07
Industry		
Basic materials	32	
Industrials	78	
Consumer goods	57	
Healthcare	46	
Consumer services	81	
Telecommunications	12	
Utilities	36	
Financials	92	
Technology	57	

Table 2 – Variable correlations [a]

Variable [b]	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Time to recovery	66.66	37.37																
2. Severity of Shock	-51.32	17.69	-0.40															
3. Sustainable or not	n/a	n/a	-0.11	0.07														
4. Years on DJSI	1.57	2.52	-0.09	0.09	0.83													
5. 3-Year avg total assets (log)	7.07	0.62	0.09	-0.19	0.29	0.37												
6. 2007 Debt-to-equity (log)	0.25	0.47	0.04	-0.29	0.06	0.11	0.54											
7. 2007 Current ratio (log)	0.34	0.2	-0.17	0.23	-0.04	-0.11	-0.56	-0.58										
8. 2007 Return-on-assets	0.07	0.08	-0.01	0.26	-0.02	-0.03	-0.34	-0.37	0.27									
9. Basic materials	n/a	n/a	0.07	-0.15	-0.09	0.01	-0.09	-0.03	0.10	0.02								
10. Industrials	n/a	n/a	0.09	0.01	0.00	-0.04	-0.10	-0.03	0.12	0.07	-0.10							
11. Consumer goods	n/a	n/a	-0.07	0.05	0.06	0.01	-0.06	0.03	0.14	0.03	-0.09	-0.14						
12. Healthcare	n/a	n/a	-0.05	0.17	0.02	0.02	-0.08	-0.15	0.13	0.04	-0.08	-0.13	-0.11					
13. Consumer services	n/a	n/a	-0.16	0.05	-0.01	-0.01	-0.10	-0.06	0.04	0.04	-0.11	-0.18	-0.15	-0.13				
14. Telecommunications	n/a	n/a	0.00	0.04	0.01	0.00	0.05	0.07	-0.04	-0.15	-0.04	-0.06	-0.05	-0.05	-0.06			
15. Utilities	n/a	n/a	0.02	0.21	-0.01	0.05	0.10	0.14	-0.08	-0.13	-0.07	-0.11	-0.09	-0.08	-0.11	-0.04		
16. Financials	n/a	n/a	0.18	-0.34	-0.06	-0.05	0.41	0.40	-0.62	-0.17	-0.12	-0.19	-0.16	-0.14	-0.19	-0.07	-0.12	
17. Technology	n/a	n/a	-0.14	0.10	0.07	0.02	-0.17	-0.28	0.32	0.05	-0.09	-0.14	-0.12	-0.11	-0.15	-0.05	-0.09	-0.16

[a] Correlations above .11 are significant at the .01 level, and those above .08 are significant at the .05 level (two-tailed tests).
[b] Variable 3 is dichotomous; variable 5 is in millions (000,000's); variables 9 through 17 are dichotomous industry controls.

Table 3 - Estimates from partial regression coefficients [a]

Variable	Model 1 - Time	Model 2 - Severity	Model 3 - Time	Model 4 - Severity
Sustainable vs. non-sustainable	-0.116*	0.069†		
	(5.338)	(2.015)		
Years as sustainable			-0.119*	0.104**
			-0.800	(0.295)
3-Year average total assets (log)	0.088	-0.005	0.098†	-0.028
	(3.981)	(1.492)	(4.101)	(1.522)
2007 Debt-to-equity (log)	-0.113†	-0.181***	-0.113†	-0.180***
	(5.128)	(1.996)	(5.129)	(1.989)
2007 Current ratio (log)	-0.092	-0.142*	-0.097	-0.136*
	(15.133)	(5.479)	(15.162)	(5.467)
2007 Return-on-assets	-0.025	0.190***	-0.025	0.185***
	(29.075)	(10.629)	(29.070)	(10.611)
Basic materials	0.031	-0.077	0.039	-0.082†
	(10.146)	(3.746)	(10.171)	(3.736)
Industrials	-0.017	0.105†	-0.021	0.107†
	(7.752)	(2.947)	(7.744)	(2.934)
Consumer goods	-0.126**	0.131*	-0.132†	0.132*
	(8.432)	(3.245)	(8.412)	(3.227)
Healthcare	-0.130†	0.217***	-0.131*	0.214***
	(8.621)	(3.270)	(8.618)	(3.259)
Consumer services	-0.237**	0.120*	-0.241**	0.120*
	(7.625)	(2.933)	(7.616)	(2.922)
Telecommunications	-0.067	0.116**	-0.070	0.117**
	(13.508)	(5.234)	(13.503)	(5.216)
Utilities	-0.061	0.294***	-0.061	0.291***
	(9.596)	(3.586)	(9.598)	(3.574)
Financials	0.007	-0.189**	-0.001	-0.178**
	(9.194)	(3.233)	(9.231)	(3.235)
Technology	-0.215*	0.177**	-0.219*	0.175**
	(8.516)	(3.260)	(8.497)	(3.243)
Constant	83.93†	-52.736***	47.505	-49.053***
Observations	395	502	395	502
Degrees of freedom	381	488	381	488
R	0.347	0.544	0.347	0.549
R Square	0.121	0.296	0.120	0.301

† p<0.10; * p < 0.05; ** p < 0.01; *** p < 0.001

[a] Standardized coefficients are reported to make transformations in the data easier to interpret; the Figures in parentheses are standard errors.