GOING BEYOND WHAT'S EXPECTED: COGNITIVELY-DIVERSE BOARDS OF DIRECTORS AND THEIR IMPACT ON FIRM SUSTAINABILITY INITIATIVES

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While institutional pressure and shareholder action has increased board of director accountability with regard to overseeing the operational needs of the firm to maintain both legitimacy and good legal standing, as an individual and as a board; there has been a simultaneous push to increase the cognitive diversity of boards of directors. The increased focus on operational performance measures coupled with changes to the composition of the board can have a serious impact on the ability for boards to communicate and reach consensus on discretionary activities. We propose to study whether cognitive diversity reduces the number and type of sustainability initiatives. While tenure and time together on the board have positive impacts on the ability of boards to initiate action, cognitive diversity actually serves to reduce the number of initiatives firms undertake and appears to reduce financial performance of the firms studied. These hypotheses are tested through an analysis of almost 150,000 voluntary disclosures, in the form of press releases, from non-financial firms in the Fortune 500, a sample which also includes an analysis of the profiles of 3,833 individual board directors using traditional and newly-developed measures of cognitive diversity. This paper demonstrates that while higher levels of cognitive diversity do not affect the ability for boards to reach consensus on operational initiatives, these higher levels of cognitive diversity do impact the ability to engage in discretionary initiatives.

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PREFACE

In addition to the tremendous support I received from my chair and my committee in completing this degree and dissertation, I would like to thank Dr. John Camillus, Dr. Dennis Galletta, Dr. John Hulland, Dr. James Manley and Carrie Woods for their efforts during this process. I would also like to thank the many members of the administrative team at Katz and my countless doctoral student colleagues.

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INTRODUCTION

US firms have been nudged by legislation such as the 2002 Sarbanes-Oxley Act to increase their board of directors' cognitive diversity, defined as variability in experiences and background, while concurrently embracing the trend in demographic diversity, which encompasses variability in age, gender, nationality and race (Jackson, May and Whitney, 1995). Diversity, the infusion of multifarious individual attributes within the firm (Ruigrok, et al., 2006), is seen as a panacea for many organizational shortcomings by both academics and practitioners alike (Bell, 2007; Boris, 2010; Coffey and Wang, 1998; Erhardt, et al., 2003; Goodstein, et al., 1994; Grosvold, et al., 2007; Hambrick, et al., 1996; Kosnick, 1990; Miller, et al., 2009; Nielsen and Huse, 2010). One such shortcoming that has generated particular interest within the realm of corporate social responsibility (CSR) are sustainability initiatives defined as efforts to reduce the negative environmental externalities caused by the economic activities of firms (Klassen and McLaughlin, 1996) or perhaps more positively "the ability of current generations to meet their needs without compromising the ability of future generations to meet theirs" (World Commission on Economic Development: 16) (Marshall and Brown, 2003; Prado-Lorenzo and Garcia-Sanchez, 2010; Fisher-Varden and Thorburn, 2010; Klassen and McLaughlin, 1996). Somewhat surprisingly, cognitive board diversity and its impact on sustainability initiatives have not been linked in the literature. This is an important omission since boards have ultimate responsibility for their firms' allocation of resources to initiatives that

address sustainability. If the number and types of sustainability initiatives undertaken by a firm is differentially impacted by the cognitive diversity of its board, it could help explain why certain firms are more likely to adopt a shared values approach to corporate strategy (Porter & Kramer, 2011). The purpose of this dissertation is to begin to address this issue by examining the following the research question; "What is the impact of cognitive diversity among the members of a firm's board on the type and number of their sustainability initiatives?"

Despite legislation like Sarbanes-Oxley, there is still confusion as to what comprises cognitive diversity. The concept of cognitive diversity defines the board by its variability with regard to experiences, background and values, as compared with demographic diversity in which boards would be defined by the variability with regard to age, gender and race (Jackson, May and Whitney, 1995). Institutional and stakeholder pressures have led firms to redefine what constitutes a diverse group of directors (Peterson, et al., 2007; Ramirez, 2003; Nguyen and Faff, 2007; Grosvold, et al., 2007; Miller and Triana, 2009; Tsui and Gutek, 1999; Boris, 2010; Zanoni, 2010). Board diversity is no longer a binary insider/outsider paradigm or a comparison of demographic characteristics amongst the board to constituent groups; the board is now fractured across demographic and more importantly cognitive dimensions (Lau and McLaughlin, 2005). Yet there is little dispute amongst proponents of Upper Echelon Theory (Argote and Greve, 2007; Hambrick, 2007) that cognitively-diverse boards' attention and the guidance they provide to top management teams are influenced significantly by their own experiences, backgrounds and values (Hambrick, 2007; Tuggle, Schnatterly and Johnson, 2010; Marquis and Lounsberry, 2007).

In general, cognitive diversity amongst the board is perceived as beneficial as it is associated with organizational innovation (Camelo-Ordaz, Hernandez-Lara and Valle-Cabrera,

2005; Bantel and Jackson, 1989) and creativity (Wiersma and Bantel, 1992). We would expect that the communication between board directors with very different backgrounds, values and experiences would be much richer in terms of the transfer of information although much more open to misinterpretation, than in boards with little cognitive diversity (Granovetter, 1973). However, cognitive diversity among board members can lead to increased coordination costs, director conflict, mistrust, low motivation and low quality communication (Ruigrok, et al., 2006 and Knight, et al., 1999). In the context of top management teams, homogeneity has been shown to outperform heterogeneity as the group can be left fractured across the multiple dimensions of cognitive diversity (Thatcher and Patel, 2011 and Hambrick, et al., 1996), a concept captured in recent research on fault lines (Lau and Murnighan, 2005). Cognitively-diverse boards, faced with a need to make a decision where there are differing views regarding goals or means for achieving them, have decision processes characterized by "quasi-resolution" of conflict (Cyert and March, 1963; 164) and shifting board attention (Ocasio, 1997) among a board fractured along fault lines by values, experiences and backgrounds (Lau and Murnighan, 2005), struggling through time-constrained board agendas (Tuggle, et al., 2010).

Within the broader CSR research stream, sustainability initiatives are a set of decisions boards need to address. These decisions have generated a great deal of research interest (Hart and Ahuja, 1996; Heintzman, 2010; Karpoff, Lott and Wherly, 2005; Fisher-Vanden and Thorburn, 2010; King and Lenox, 2000 & 2001; Walls, Berrone and Phan, 2012) but limited theoretical insights. The literature has categorized sustainable initiatives as either operational (Gilley, et al., 2000) or environmental stewardship, programs which have been described as opportunities for the firm to improve the image of the firm or its industry (Klassen and McLaughlin, 1996 and King and Lenox, 2000). Operational sustainability initiatives are those

generating revenue through identification of new markets and products; those reducing expenses by saving on energy and disposal costs; those offering a direct and observable connection to measurable benefits and those having more predictable returns. Discretionary sustainability initiatives, not mandated by government policies or shareholder expectations, often fall within the realm of corporate social responsibility (CSR); where outcomes and therefore the rewards and punitive measures are more open to interpretation and manipulation (Delmas and Montes-Sancho, 2010). These initiatives may still have a financial impact and can be of several types, including aspirational, helping to save the Earth; explanatory, helping stakeholders understand how the firm is "green"; laudatory, helping communities and being rewarded with recognition; or simply going beyond what's expected, organizing and recycling post-consumer products.

Operational sustainability initiatives have a close connection to the "bottom line", whether it is a transition to a more fuel efficient truck fleet or the inclusion of hydropower to the infrastructure of a new computer facility. Discretionary sustainability initiatives, unlike operational sustainability initiatives do not have a clear causally-defined relationship between the initiative and financial performance. As a result they are one step removed from the socially understood and legitimized fiduciary duties of boards. When cognitively-diverse boards do not have a compelling need to launch discretionary sustainable initiatives, and given how often these initiatives can represent a change in position for the firm, particularly when new; boards may be divided by their world views and personal biases (Dahlin, Weingart and Hinds, 2005; Wiersma and Bantel, 1992). The challenges in arriving at a consensus on discretionary initiatives may cause busy boards to focus only on those initiatives most closely aligned with their fiduciary duties and institutional norms and yet it may be that the engagement of these discretionary initiatives is what separates industry leaders from their lagging rivals.

While boards can become fractured by their personal experiences, values and beliefs, in reality board directors may have long concurrent service, here called tenure. Joint service on the board allows for directors to have common experiences and become socialized (Michel and Hambrick, 1992) reducing coordination costs and perhaps even altering director perceptions and outlooks (Kosnick, 1990).

Drawing on a sample of 356 non-financial sector US firms from the Fortune 500, we constructed a database of 3,833 board directors and almost 150,000 corporate initiatives over a period from 2004-2009. For each director, we collected demographic and cognitive diversity characteristics, and for each initiative, we determined whether it was related to sustainability, and categorized it as either operational or discretionary. We test hypotheses that cognitively-diverse boards of directors will place a priority on their fiduciary duties with regard to operational sustainable initiatives.

This paper contributes to the literature in several ways. This paper creates a broader definition of cognitive diversity. The board of directors is envisioned, first theoretically and then operationally, as a group of individuals with a complex set of interacting belief systems derived from their values, experiences and backgrounds. Unlike previous research, this research focuses on the power of cognitive diversity to constrict the ability for meaningful discussion. A lack of certainty as to outcomes, institutional norms or institutional controls allows for firms to create and justify a wide range of potential activities. In this way the paper links the findings of Upper Echelon Theory (Hambrick, 1996) with those from institutional researchers (DiMaggio and Powell, 1983; Oliver, 1991; Montes and Sancho, 2010; and George, Chattopadhyay, Sitkin, and Barden, 2006). Further, this paper heeds the call from Tsui and Gutek (1999) for more sophisticated constructs which develop a richer definition of diversity along with the

determination by Walls, Berrone, and Phan (2012) that little has been done to theoretically link corporate governance and sustainability; this paper introduces and empirically tests the relationship between a composite measure of cognitive diversity and sustainability. Few empirical articles have attempted to explicitly include the fully-developed constructs at consideration here. Either firms are monolithic with no role for individuals (Klassen and McLaughlin, 1996; Fisher-Varden and Thorburn, 2010; and Lenox and King, 2000) or boards are diverse individuals and the particulars of the decision at hand are not explored (Coffey and Wang, 1998; Forker, 1992; Erhardt, et al., 2003; and Dahlin et al., 2005). Delmas and Burbano (2011); Carter, Simpkins and Simpson (2002); Ricart, Rodriguez and Sanchez (2005); Berrone, Cruz, Gomez-Mejia and Larraza-Kintana (2010) and Walls, et al., (2012) have also tied corporate governance and sustainability but to my knowledge there has been no research, in either academic journals or amongst the many working papers available, which connects cognitively-diverse directors with their strategic decisions in the closely-watched and strategically important field of sustainability.

Theory and Hypotheses

Two theories frame our understanding of how the cognitive diversity of boards of directors effect the number and type of initiatives they undertake. To develop our hypotheses we link Upper Echelon Theory, which informs our understanding of cognitive diversity and the ways in which it impacts action (Hambrick, et al., 1986) and Institutional Theory, which guides our

understanding of directors as actors seeking to maintain individual and organizational legitimacy (George, et al., 2006).

Upper Echelon Theory, Cognitive Diversity and Strategic Initiatives

Upper echelon theory (Hambrick, 2007; Hambrick and Mason, 1984) focuses on the way values, experiences and perceptions influence how directors perceive the world and how those perceptions influence action. Hambrick (2007: 335) advanced the conviction that "researchers can reliably use information on executives' functional backgrounds, industry and firm tenures, educational credentials, and affiliations to develop predictions of strategic actions." Extending this logic to the board, Tuggle, et al. (2010) found support for the view that directors' characteristics impact discussions in the board room. Hambrick and Mason (1984) reasoned that the more complicated a decision such as those involving innovation, complexity and finance the more likely directors will bring their personal biases and perceptions to the discussion. Bantel and Jackson (1989) went farther stating that as complexity of the decisions faced by the board increases; groups are more effective when they are composed of individuals having a variety of educational and functional backgrounds. This variety is associated with being able to access a broader set of information, alternatives and perspectives. However, variability has its downside as well. When boards are diverse, complex or controversial decisions can lead to fractures among board members and constrain discussions (Thatcher and Patel, 2011, Hambrick, 1996, and Tuggle, et al., 2010).

While a precise definition of cognitive diversity has proven elusive and mutable (Putnam, 2011) it has become increasingly inclusive. Just a generation ago diversity referred to a

director's affiliations outside their positional roles. As the boardroom and the workplace became more diverse, theory has struggled to keep pace. Scholars initially focused on demographic traits or surface-level attributes including age, race, gender, nationality, physical appearance, language and dialect (Jackson, et al., 2005; Peterson, et al., 2007; Ramirez, 2003; Nguyen and Faff, 2007; Grosvold, et al., 2007; Miller and Triana, 2009; Tsui and Gutek, 1999). The inclusion of surface-level attributes resulted in limited contributions due to the lack of a strong theoretical foundation and explanatory power (Ramirez, 2003). In response to ongoing academic inquiry and institutional pressures, researchers have expanded the diversity perspective to include cognitive, or deep-level, attributes such as education, tenure, occupation, religion, functional background, socioeconomic status, values, veteran status, social memberships and affiliations, sexual orientation and differently-abled status (Jackson, et al., 2005; Finkelstein, et al., 2009; Tsui and Gutek, 1999, Goodstein, et al., 1994, Boris, 2010; Zanoni, 2010). As a result of variability in deep-level attributes cognitively-diverse boards of directors have a broad range of viewpoints and biases (Jackson, et al., 2005). This is because each board member will select and use information sources in ways consistent with their own perspective (Dahlin, Weingart and Hinds, 2005; Tuggle, et al., 2010). For scholars studying the links between creativity, the variety of innovative idea and their impact on the number and type of strategic initiatives cognitive diversity is viewed favorably (Wiersma and Bantel, 1992). Diversity among board members provides the opportunity to use their diverse experiences and resulting viewpoints to identify a greater number and variety of initiatives when addressing a strategic issue.

However, cognitive diversity is not without costs (Milliken and Martins, 1996). Goodstein, et al. (1994) found that occupationally-diverse boards were less likely to agree on strategic actions. Erhardt, et al., (2003) found that experience diversity had a negative impact on

communication among the executives. Functional diversity in top management teams increases coordination costs and as a result the time and effort required to reach consensus (Knight et al., 1999; Shrader et al. 1997). Hambrick, et al., (1996) found that diverse top management teams, where diversity was defined among functional, educational and tenure attributes, were outperformed by homogeneous teams. The more diverse teams were slower to act and less likely to respond to competitor moves. Their finding suggests that cognitive diversity may impair group decision making and in some cases overwhelm its innovation benefits. While diversity doesn't halt the resolution of an issue, it may impact the number and types of initiatives undertaken for an issue, especially when they require boards to reconcile initiatives that are inconsistent with some of their members' individual perspectives.

Institutional Theory, Cognitive Diversity and Strategic Initiatives

For institutional theorists, organizations and individuals seek legitimacy which involves undertaking initiatives that are viewed as "appropriate" (Dimaggio and Powell, 1983; Oliver, 1991; Rumelt, et al., 1994). Institutional theory suggests there are restraints on directors' action, the mechanisms by which directors resolve conflict and the behaviors which firms engage in to maintain legitimacy and to avoid sanctions (DiMaggio and Powell, 1983; Miller and Shull, 1962). Political and normative pressures are applied to directors and their firms (DiMaggio and Powell, 1983) from governmental entities, stakeholders, shareholders, customers, partners and rivals.

Early institutional researchers saw the firm as limited by the constraints of seeking and maintaining legitimacy (Dimaggio and Powell, 1983), but a more recent stream of research has posited a more active role for key individuals and the firm. George, et al., (2006) focused on an active role for the individual (director) in "the perpetuation of institutions, or in their creation or change" (George, 2006: 348) which determines how the firm behaves and what initiatives it undertakes. Shropshire (2010) conceptualized directors as conduits for the exchange of knowledge between firms. For Mizruchi (1996), directors actively share practices, policies and initiatives developed in organizations with which they are associated, bring them back to their firm, and also share them with firms they serve. The process of sharing and adoption reinforces the legitimacy and stability of those initiatives (Rumelt, et al., 1994). Useem (1982) also conceptualized board interlocks as vehicles for sharing and learning, with directors actively scanning and sharing new information, initiatives and successes which results in granting greater legitimacy to knowledge passed between directors.

Directors, especially those with long service, and those with board interlocks, become institutionalized (Kosnik, 1990). With increased tenure and increased legitimacy they establish tradition, standard practices and values (Katz, 1982; Kosnik, 1990). However, legitimacy can be mutable and manipulated (Delmas and Montes-Sancho, 2010). Directors can engage in behaviors that are symbolic rather than substantive, garner all of the reputational benefits of substantive action, and possibly even avoid sanction for themselves and the firm (Delmas and Montes-Sancho, 2010).

The view of the director as playing an active role in creating their environment is supported by applied research as well. Lawler, Finegold, Benson and Conger (2002) studied how directors spent their time and what roles directors viewed as most important. The four most

important tasks were focused on actively shaping strategy, including "identifying possible threats and opportunities to the future of the company" (Lawler, et al., 2002: 316) which was the board activity that yielded the best ROI and market returns. This perspective is also supported by Grady (1999) who found that companies switching to proactive board processes focus on "long-term issues such as strategy, corporate culture, and initiatives for change" (Grady, 1999: 20).

Our review of the application of institutional and upper echelon theories to boards of directors reveals a tension. Upper echelon research provides evidence that when boards have high levels of cognitive diversity, it leads to varying perspectives regarding the type, importance, credibility, goals and means for achieving strategic initiative (Hambrick, 2007; Hambrick and Mason, 1984; Tuggle, et al., 2010; Bantel and Jackson, 1989; Marquis and Lounsberry, 2007). However, in the quest to achieve legitimacy, the variety in perspectives resulting from cognitively-diverse boards can lead to long payback times, contested decisions, consume resources and impact the reputation of the firm (Wiersema and Bantel, 1992). In other words, the level of cognitive diversity amongst the board directors will impact the level of conflict, and therefore the number of initiatives under consideration, amongst board of directors' perceptions and viewpoints, as they decide on strategic initiatives that have legitimacy-related consequences (Tuggle, et al., 2010). Boards with high cognitive diversity have by definition more fault lines than homogenous boards, with lower cognitive diversity and therefore more conflict (Lau and McLaughlin, 2005).

Operational and Discretionary Sustainability Initiatives

There is evidence that firms, and therefore shareholders, benefit from any kind of sustainable initiatives (Klassen and McLaughlin, 1996; King and Lenox, 2001; Karpoff, et al., 2005; Hart and Ahuja, 1996; Hamilton, 1995; Gilley, et al., 2000; Fisher-Vanden and Thorburn, 2010; Delmas and Burbano, 2011; Luo, et al., 2012); here defined as activities which include consideration of environmental performance as part of a triple bottom line (Marshall and Brown, 2003; Schendler, 2009; Roy, Boiral and Paille, 2013), Even when firms and their shareholders do not directly benefit there may be societal benefits (King and Lenox, 2000) as sustainability can be thought of as "the ability of current generations to meet their needs without compromising the ability of future generations to meet theirs" (World Commission on Environment and Development, 2013: 16).

Both operational and discretionary sustainability initiatives, specific efforts to reduce the negative externalities related to economic activity, are complicated strategic activities (Schendler, 2009) that could result in conflict amongst directors based on their personal biases and past experience. Operational sustainability initiatives are those that have a clear payback and a close tie to a firm's operations. Operational initiatives such as, total quality management, just-in-time techniques and benchmarking have been widely adopted (Yasin, Augusto, Lisboa and Miller (2011) as efficiency efforts in the realm of sustainability. Directors seeking legitimacy for themselves and their firms identify the absence of these types of initiatives as a threat to the organization and guide the firm towards their implementation (Lawler, et al., 2002). Directors in the wake of Sarbanes-Oxley understand very clearly their fiduciary duties to the firm

and their shareholders. There are real sanctions for directors who do not operate in a manner consistent with maximizing shareholder returns (Rezaee, 2007). Operational sustainability initiatives, as revenue-enhancing or cost-cutting, present very real ways for directors to impact the financial performance of the firm. We would expect both cognitively homogeneous and diverse boards of directors to focus on coming to consensus on operational sustainability initiatives and place their fiduciary duties in primacy above their personal biases.

In contrast to operational initiatives, Boiral and Paille (2012) have suggested that discretionary initiatives are unrewarded by the firm, and by extension, the market. Discretionary initiatives, which are activities that are voluntary but often important and hard to measure (Smith, 2010), often result from an understanding of good corporate citizenship, and as such, this type of sustainability initiative have less clear connections to both the performance and legitimacy of the firm and the legitimacy of the individual directors. Discretionary sustainability initiatives are generally more aspirational in nature, asking the firm to go beyond what is expected. Due to their aspirational nature and causal ambiguity, discretionary sustainability initiatives face questions about their efficacy; underlying cause-effect relationships; and create uncertainty for directors. Thus, decisions related to discretionary sustainability initiatives may result in value-based conflict for directors facing time-constrained agendas and limited attention (Ocasio, 1997; Tuggle, et al., 2010). As a result, cognitively-diverse boards may face a clash of values exacerbated by communication failures and disagreements about the validity of the "facts". With short, crowded agendas, busy directors may seek compromise, adopt a wait and see attitude, or table discretionary initiatives.

An important distinction between operational and discretionary initiatives is the directors' perceptions with regard to their need to maintain legitimacy. For directors who are not

convinced of the cause-effect relationships underlying a discretionary sustainability initiative, they can be viewed as less strategic or legitimate and therefore not worthy of directors' time. Sonenshein, DeCelles and Dutton (2014) have found even among executives who support environmental issues, there are doubts about the efficacy of environmental initiatives and their role in making a positive change. Directors might also opine that operationally sustainable initiatives should suffice to demonstrate a commitment to sustainability. It may be easier for a cognitively-diverse board to not launch new discretionary initiatives and stay the course since conservative thinking requires less effort (Eidelman, Crandall, Goodman and Blanchar, 2012). Therefore:

H1: *Boards with high levels of cognitive diversity will engage in fewer sustainability initiatives than boards with low levels of cognitive diversity*

Moderating Role of Initiative Type

Porter suggests, "The essence of strategy is choosing to perform activities differently than rivals do" (Porter, 1996: 64). Three implications can be drawn from this. One, that there are groups of activities, or initiatives, that are common across firms, which in this paper are designated as operational initiatives. These are initiatives or opportunities to increase revenue or decrease expenses in direct ways and are readily embraced by the organization. Two, there is a separate class of initiatives that are chosen by the top management team (TMT) in consultation with the board of directors, which can form the basis for differentiation between the firm and its rivals. Three, firms must weigh the "when" and "how" of disclosing these activities.

As George, et al. (2006) found, high-performing firms may be identified by their ability to launch initiatives that respond to multiple perceptions of the environment. Said another way, firms which have boards that are able to better digest and synthesize divergent world views, composed of the cognitive biases of the individual board directors, and determine an appropriate set of responses to environmental threats and opportunities, should have better firm performance.

While Jackson and Parsa (2009) detail the potential for financial disadvantage due to the cost of such discretionary initiatives, links have been formed between discretionary initiatives focused around CSR and sustainability. Those links have been shown to positively impact stock prices (Fisher-Varden and Thorburn, 2010 and King and Lenox, 2001). Discretionary CSR initiatives have also been shown to correlate with improved stakeholder impression of the focal firm (Jackson and Parsa, 2009).

Based on the work of George, et al. (2006), high performing boards launch initiatives; however firms may find the need to protect their "news" if it is viewed as proprietary in nature, or the source of advantage (Barney, 1991). Even though researchers have found a relationship between positive disclosures with regard to environmental performance (Fisher-Varden and Thorson, 2010; Lenox and King, 2001), the potential stock gains must be weighed against the value of market signals to rivals. Clarkson, et al. (2011) conducted a review of sustainable performance in Australia and found little connection between performance and disclosures about performance, suggesting some firms are just more likely to disclose information than others. Therefore;

H2: *The use of a higher percentage of discretionary vs operational initiatives will positively moderate the relationship between cognitive diversity and sustainable initiatives.*

Moderating Role of Tenure

Tenure, or the length of continual service in the firm or on the board, has been associated with positive firm performance (Pfeffer and Salancik,1980; McEachern,1975), leads to functional specialization by incumbents (Helmich, 1977) and the institutionalization of power within the organization (Pfeffer and Salancik (1978, 1980). Pfeffer and Salancik (1980) found that when profitability and market performance are positive, executives are retained. As executives and board members become entrenched in their positions, they develop a greater understanding of their role through experience, socialization and cohesion (Chao, O'Leary, Wolf, Klein and Gardner, 1994; Michel and Hambrick, 1992). Once entrenched, executives and board members remain in place even when there is a negative relationship between tenure and performance (Pfeffer and Salancik, (1980). Therefore tenure has been recognized as critical in understanding how boards of directors behave (Hambrick, 2007; Wiersma and Bantel, 1992; Kosnick, 1990).

There are tremendous benefits to boards serving for a period of time together. Boards with longer-tenured members understand the firm's traditions and organizational values and will adhere to them (Katz, 1992); develop better communication both among the team and external to the team (Kosnik, 1990; Zenger and Lawrence, 1989); and develop common perspectives and social integration through shared experiences (O'Reilly, 1989). Thus, tenure reduces the impact of cognitive diversity among board members.

Changes in the tenure of the board occur when boards add new members or when incumbent members leave the board. Pfeffer (1983) reasoned that new board members form cohorts that become cohesive, conforming, and mutually reinforcing. As a result, cohort members are more likely to interact with each other. New board members have the highest

levels of creativity and are most likely to suggest new ideas (Kosnick, 1990). These new members or cohorts reduce the potential of group-think within the board since they bring diversity (Kosnick, 1990). As a result, they increase communication difficulties across cohorts (Bantel and Jackson, 1989). Drawing on upper echelon theory, Tuggle, et al., (2010) demonstrated that tenure diversity was crucial to the monitoring and advising activities of the board.

Boards which spend time together develop methods of overcoming coordination difficulties (Martins and Milliken, 1996). As board tenure increases, performance of directors improves (Katz, 1982) as they learn more about the company, develop richer information patterns within the group, and find common perspectives emerging from discussion (Kosnik, 1990). As a director becomes more aware of and more engrained in the values and practices of the firm, s/he gains a better appreciation of the reputational effects of the firm's activities, becomes more protective of the firm's legitimacy and therefore demonstrates greater conformity (Kosnik, 1990).

As a common perspective emerges within the board of directors as to the firm's place in their environment and the steps necessary to maintain that standing, the effect of individual directors' diversity is lessened. It is replaced with a more homogenized view of the firm which should attenuate the negative effect of cognitive diversity on the number of discretionary sustainability initiatives.

The result of this homogenization is that decisions should be arrived at more quickly as directors more readily understand each other's perspectives, communication approaches and routines for conflict resolution. As a result, time constraints in tightly-packed agendas are reduced since board members will engage in less disagreement. In other words, there is time to

discuss and decide on discretionary sustainability initiatives. However, a negative potential result of this homogenization is group think. Boards with high levels of tenure, defined as tenure greater than its peer group (Katz, 1982), produce less-creative and lower-quality decisions (Kosnick, 1990). These decisions should take less time to develop and ratify.

H3: *Board tenure positively moderates the cognitive diversity – discretionary sustainability initiatives relationship. That is, high cognitively-diverse boards will engage in more discretionary sustainability initiatives when they have high levels of tenure.*

Methodology

Sample

The 356 nonfinancial firms listed in the Fortune 500 during 2004, which were still active in 2010, were selected as the sample. Consistent with Gompers, et al., (2003), 58 firms were removed from the original sample because they were holding companies or financial/insurance firms. In addition, 86 firms were removed because they either merged or were acquired at some point during this period. The time period 2004-2010 was chosen because it allows sufficient time for firms to respond to negative environmental events, including toxic releases and chemical spills, as well as initiated sustainability initiatives coming to fruition. Finally, 2004 was selected because this was a Presidential election year in the United States. Political activity is cyclical in the United States, based on Presidential election years. An election year is likely to identify politically active board members and their political affiliation. Contributions cycle up both in number (a clearer understanding of the corporate directors' values) and size (which is more likely to put them above the $200 individual reporting threshold of the Federal Election Commission {FEC}).

Variables and Data Sources

Sustainable Initiatives

Consistent with previous research (Gilley, et al., 2000; Karpoff, et al., 2005; King and Lenox, 2001; Klassen & McLaughlin, 1996) sustainable initiatives were operationalized to include all voluntarily disclosures which are public statements by the firm of their own activities. Information on voluntary disclosure of corporate initiatives was gathered for most firms from their corporate websites in a method consistent with prior research (Forker, 1992, Stevens, et al., 2005). Voluntary disclosures, including press releases, SEC documents, Annual Reports and Special Reports, are archived online. In some cases the disclosures were readily available dating from the founding of the company; in others the disclosures were available only for the past few years. Lexis-Nexis was used to fill the gaps for those companies which did not report or archive their disclosures on their websites during the study period.

We used two rounds to identify the number of sustainability initiatives as well as the total number of initiatives (a control variable for the propensity to disclose) for each firm. 149,958 voluntary disclosures were identified and evaluated. We found 4,775 of the disclosures (or slightly more than 3%) were related to sustainability. The initiatives were divided into two categories (1) operational of which there were 1,384 and (2) 3,391, discretionary activities. In the first round, based on a review of recent literature on sustainability in EBESCO Business Source Complete, articles in the Economist and recently published books on sustainability, a number of key words were developed. Any disclosures using a variant of key words such as

"sustainability," "environment," "green" was counted, as were those that referenced abatement or mitigation of EPA issues, those that proposed energy-savings programs, and those that involved alternative energy programs. The sustainable initiatives identified for each firm, based on the title of the voluntary disclosure, were tallied. Two researchers independently reviewed the firm voluntary disclosures and used a common coding sheet with key words identified with sustainability. There was one discrepancy based on the definitions. One researcher missed the following press release, which was added to the official tally as an efficiency initiative: "Best Buy, Pew Climate Change Center, Best Energy Efficiency Practices".

The purpose of the second round was to identify the propensity of a firm to disclose (a control variable) and to identify any sustainability initiatives that did not use the key words in round one. Thirty-nine sustainability initiatives were identified, reconciled by the researchers and added to the database.

Operational Initiatives

We build on the work of Goodstein, et al., (1994) and Delmas and Montes-Sancho (2010), who delineated between superficial and meaningful firm activities. The coding method used to score operational initiatives were of two types: (1) revenue enhancing - those that indicated an attempt to grow the firm, introduce a new business, expand successful pilot programs, or secure new customers and (2) cost reduction - those which indicated an attempt to reduce operating costs or trim expenses, such as decisions to reduce energy usage to reduce greenhouse gas emissions or the adoption of tools, ranging from light bulbs to trucks, which are more environmentally

friendly. *Pct. Operational* reflects the total number of sustainability initiatives that are categorized as operational and then divided by the total number of sustainable initiatives.

Discretionary Initiatives

Scallet and Kelly (2010) suggested that individuals desire to feel good about the company they are working for and that the company is doing the right things for the environment. In addition, institutional and stakeholder pressures encourage firms to engage in sustainability initiatives (King and Lenox, 2001; Fisher-Varden and Thorburn, 2010). Discretionary initiatives capture voluntary disclosures that are aspirational, informational or laudatory in nature. The coding of these initiatives captures firm activities that are related to sustainability but do not have an immediate, direct payoff. Examples include announcements of green or sustainable awards; affirmations of the firm's commitment to sustainability; and initiation of post-consumer recycling programs. *Pct. Discretionary* reflects the total number of sustainability initiatives that are categorized as discretionary and then divided by the total number of sustainable initiatives.

Cognitive Diversity

Cognitive diversity is a composite measure created by summing Blau's indexes for each individual characteristic (Tsui and Gutek, 1999; Chae and Lee, 2010). This is consistent with past literature (Tuggle, et al., 2010; Bantel and Jackson, 1989) and demonstrates when the

diversity of the group increases. Twenty five individual characteristics, political activity, political affiliation, veteran status, religion, educational attainment, source of education and functional background, were converted to binary measures for each director and then a measure of dispersion was calculated for each characteristic. See appendix 3. The measures of dispersion were then summed and adjusted for small group bias (Lambert, 1992).

INSERT TABLE 1 APPROXIMATELY HERE

The RiskMetrics database (formerly the IRRC database) combines firm and individual director-level data drawn from corporate filings. The database was used to retrieve director-level data. Director name, age, gender, nationality, tenure, job characteristics and functional background experience (in most cases current job/career field) were extracted from the database. This data was then supplemented by several sources. Corporate annual reports were consulted for several of the companies. These provided validation of demographic information; in depth biographies and affiliations about their corporate directors. The nndb.com database also provided validation of the demographic characteristics as well as information about careers, education, background and value characteristics such as veteran status and political affiliation. The Federal Election Commission, through its website, fec.gov, also provides several databases on political contributors, both to political parties and to political action committees.

Functional Background has been used in management research as a proxy for cognitive diversity by Goodstein, Guatam & Boeker (1994) for board members and by Hambrick (1996) and by Bentel (1993) in relation to the top management team. Consistent with Goodstein, Guatam and Boeker (1994) we use occupational groupings to assess functional *background* (Executive, Board Director, Retired, Lawyer, Finance, Consulting, CPA, Academic, Political,

and Other). This work was based on Pfeffer (1972) and (1973) and Kosnik (1990) and the data is included in the RiskMetrics database. While some researchers have used up to sixteen categories of background coding (e.g., Hambrick, Cho and Chen, 1996); several of the categories had no or very few directors, these were condensed into the 'other' category as per previous research (Tuggle, Schnatterly and Johnson, 2010).

Functional background has been discussed by a host of researchers from Hambrick (1996), in his top management team theories, to Westphal and Milton (2000); Goodstein, Guatam and Boeker (1994); Peterson, Philpot and O'Shaughnessy (2007); and Milliken and Martins (1996). Like Ramirez (2003) all of these researchers have recognized that importance of background in the way executives frame issues and solve problems.

School represents the type of school the director attended, while *Education* represents the type of degree the director attained. Education also goes beyond just the discipline or degree. Based on the work of Hambrick, et al. (1996); Westphal and Milton (2000) and Westphal and Stern (2006); two measures of education were used. First, a measure based on the source of the education included a dichotomous coding of each director as having attended either an elite university or not; a private university or not; a public university or not; or not having received any formal education. Second, a measure of the type of education included a dichotomous coding of each directors based on their highest level of education PhD, JD, MD, MBA, Masters or other.

Political Involvement is a dichotomous variable coded 1 for individual board members who self-report political membership in a party or make donations to political groups and 0 for those who do not. *Political viewpoint is* a dichotomous measure of political affiliation with 1 for

individuals identifying with conservative causes and 0 for those who do not. *Veteran status* is a dichotomous variable for individuals who self-report military service (coded 1) and *religious affiliation* is a dichotomous variable for individuals who self-report membership in a religious group of any kind. There has been some research in the social sciences considering differences amongst individuals based solely on their political choices. The use of these variables is consistent with work by Brooks (2006).

Tenure

Tenure is a moderating variable hypothesized to influence the relationship between cognitive board diversity and the type and frequency of initiatives. As board directors enter and exit the board, the group dynamics necessarily change. Individual directors learn to reduce interpersonal barriers, which lowers coordination costs and maintains the benefits of diverse viewpoints. As Kosnick (1990) pointed out, there is a compositional effect to boards and use of average measures account for the changes to the board and resulting changes to the interpersonal activities. *Tenure* is measured as the average number of years the directors have continuous service on the board. This view of tenure reflects positive changes to the individual performance of directors (Katz, 1982) and positive changes to the group dynamic (Martins and Milliken, 1996 and Kosnik, 1990). Therefore a new board director would be coded as "0" for no continuous service on the board and each year the board director remained would yield a higher positive number. As boards stayed together the average of their tenure would increase.

Controls

We included controls that are theoretically related to our research question. The Compustat database was used to gather information on the firm and industry controls. Although the sample includes the largest US firms, the distribution in terms of size is skewed. We control for the relative size of firms in two ways. *Natural Log of Revenue*, consistent with Ruigrok, et al. (2006), given that our initial sample had a median 2004 sales of $26,587 million and a range of $15,747 to $258,681 million, the raw revenue numbers were converted into natural log of the revenue. *Natural Log of Employees* was also considered, and given the range of firm size was converted into the natural log of number of employees. *Organizational slack*, the non-deployed resources available to the firm for new initiatives (Daniel, Lohrke, Fornaciari and Turner, 2004), was suggested by Hambrick, Cho and Chen (1996) as a potential rival explanation to differences in organizational outcomes. Firms which have greater levels of organizational slack have additional freedom of action with regard to competitive moves (Hambrick, Cho and Chen; 1996). In addition, firms with greater slack have the resources necessary to make greater voluntary environmental investments (Fisher-Vanden and Thorburn, 2010). A one-year lagged measure of firm performance, *Profits*, or income from continuing operations attributable to the firm (consistent with the Fortune 500 methodology), was also included to be consistent with their methodology.

To test the financial performance measure, I have chosen three discrete periods of time to test whether firm's see any improvement in their financial position as a result of implementing sustainability initiatives. Schendler (2009) makes the case that the positive impact of

sustainability must be felt immediately but also over the long-term. Consistent with Russo and Fouts (1997) who felt that two years represented "an adequate period in which to test the influence of environmental performance" (544) I tested the return on assets one year into my sample and at each year in the sample, 2008 is shown in the table. The primary *SIC* was included to capture those firms within manufacturing and extractive (mining and energy) sectors as opposed to firms in the service industries. The primary *SIC* was included to capture those firms within manufacturing and extractive (mining and energy) sectors as opposed to firms in the service industries. The primary SIC for each firm was gathered from the Mergent Online database. Firms where the primary SIC was manufacturing or extractive were coded as a "1" consistent with Delmas and Burbano (2011), who posited that industry, particularly brown industries (those more likely to have negative externalities – manufacturing and extractive firms), is an important component in whether firms signal the market place about sustainable activity.

Past events (Finklestein, et al., 2009) may suggest whether a firm focuses on sustainability and environmental issues; therefore environmental events (*EPA Incidents*) were measured consistent with Meyer (1995) by the Toxic Release Inventory (TRI). The United States Environmental Protection Agency (EPA) maintains the TRI database which was used to find negative environmental events as a control for whether the company in question had a negative impact on the environment. *Climate Leaders* is meant as a proxy for leadership in the field of sustainable business practices, and is represented here by the program, since discontinued, which was a voluntary commitment by firms to be a leader in environmental stewardship. As such they are strong signals. In addition, the program provides information about when a firm joined.

All voluntary disclosures for the sample firms were included as a control variable *Total Initiatives*, as a measure of propensity to disclose (Acquisti, John and Loewenstein, 2012).

The size of the board was controlled. A larger board indicates that each individual member has a smaller impact (Judge and Zeithaml, 1992) and therefore *board size*, or the number of board members for each firm in IRRC, was controlled.

Duality is a measure of the instances where the CEO of the firm is also the chairman of the board of directors. There is extensive and conflicting literature as to the impact of CEO duality on the firm and its performance stemming from the agency theory of the firm (Elsayed, 2007).

Demographic diversity is a composite measure created by summing Blau's indexes for individual characteristics (Chae and Lee, 2010) and additional information is included in appendix 4. Tsui and Gutek (1999) asked for more rigorous diversity methodologies and the use of the Blau's index is consistent with current literature (Tuggle, et al., 2010). Race, gender, ethnicity and age have been used as proxies for demographic diversity. *Race* has been widely used in management research. Peterson, Philpot & O'Shaugnessy; Westphal & Stern (2006) and Miller & Triana (2009) all consider the corporate governance implications of race. It is a dichotomous variable coded on the 2000 US Census racial categories as reported for individual directors in RiskMetrics. The Census used six categories which do not match well with those in the sample, White, Black, American Indian or Alaskan Native, Asian, Hawaiian or Pacific Islander and "some other race". For our purposes, race is dichotomously coded for each director. Each director was coded dichotomously as being Caucasian, or not; African-American, or not; Hispanic, or not; Asian, or not; or other. As mentioned above, some US Census categories, such

as nationality or race, were so under-represented their category could be collapsed into other with no impact on results. *Gender* is a dichotomous variable coded 0 for males and 1 for females. This variable has been considered by Peterson, Philpot & O'Shaughnessy (2007); Grosvold, et al. (2007); Westphal & Stern (2006) and Nguyen & Faff (2006). *Ethnicity* is a dichotomous variable based on the Hofstede scale coded as US, Canadian, Mexican, European, Japanese, Australian, Mainland Asian, from Central or South America, or from the Middle East, including Africa. Westphal & Stern (2006) included ethnicity in their sample to assist in looking for non-obvious links between board members, while Palmer & Varner (2007) cataloged TMT diversity. A sample consisting of all directors in the RiskMetrics database for 2004 yields a median age for a US corporate director as 60, with a range of 29 to 95. *Age* becomes a continuous variable and is calculated based on the absolute difference in age of the director and the median age for all directors.

Data Analysis

A Poisson regression technique is appropriate for event studies such as this one for measuring the number of rare events that occur during a period of time, in this case from 2004 through 2010. As tables 6, 7 and 8 assert, for most of this sample, there are no or very few initiatives. Table 6 shows that of the 356 firms in the sample, 202 have no operational initiatives, while table 7 shows that 155 firms in the same sample have no discretionary initiatives. As table 8 indicates, a sizable part of the sample, 141 firms, has conducted neither operational nor discretionary initiatives. Therefore, a zero-inflated Poisson regression model (Lambert, 1992)

was used due to the very large number of cells which contained a zero. A significant Vuong test indicates that the zero-inflated Poisson (ZIP) regression is an appropriate choice. The test was significant for each hypothesis.

Table 2 presents the descriptive statistics including means and standard deviations for the variables and the correlations.

INSERT TABLE 2 APPROXIMATELY HERE

Results

Supporting H1 model 2 in table 3 shows that cognitive diversity was significantly associated with sustainable initiatives. Firms with cognitively-diverse boards of directors launch fewer Sustainable Initiatives than firms with less cognitively-diverse boards. Within the parameters that this is a McFadden's pseudo R^2 in a Poisson regression and not a true R^2, more of the variance in discretionary initiatives was explained by cognitive diversity and the control variables than was explained of the variance in operational initiatives. That said, the inclusion of Cognitive Diversity raised the pseudo R^2 from 0.364 to 0.371.

Several of the firm-level control variables remained significant. Revenue, Profits and Employees and SIC; as well as the past performance measures, EPA Incidents and participation in Climate Leaders, were also significant. Duality was significant and negatively related to the number of sustainability initiatives. Size and Profits were not significantly related to Sustainable Initiatives.

Table 4 shows support for H2, the percentage of Discretionary Initiatives is significant and positively related to Sustainable Initiatives. The firms that engage in a greater percentage of discretionary initiatives; that is, are able to resolve the conflicts around the issue of sustainability and move beyond those related directly to financial performance; will engage in more sustainability initiatives. The control variables continue to be significant with the exception of Size and Profits. The inclusion of percentage of Discretionary Initiatives raises the pseudo R^2 from 0.364 to 0.373.

Table 6 does not show support for H3, however if the standard for significance were to be relaxed, the relationship would be significant at the 0.10 level (Model 18). Tenure was positively related to Discretionary Initiatives (Model 17) as a main effect. The interaction of these two continuous variables, tenure and cognitive diversity, was not significant in Model 18, although the explanatory power of the variance in sustainable initiatives 0.353. Once again there were significant relationships between firm level controls (Revenue and Employees) and past performance controls (EPA Incidents and participation in Climate Leaders). Duality was again significant and negatively related to the variance in these types of initiatives. Unlike the other firm-level variables, the relationship between Profits and Sustainability Initiatives was not significant although Size is now significant.

Discussion

With this article we explore the relationship between board cognitive diversity and the launch of operational and discretionary sustainability initiatives. By linking corporate governance and

sustainability we address several key issues that have heretofore been under-represented in the management literature.

We find that while the ability for cognitively-diverse boards to enact operational sustainability initiatives is not impacted, discretionary initiatives are curtailed. This suggests that busy boards, fractured by fault lines (Lau and McLaughlin, 2005) along experience, values and backgrounds, struggle to find consensus when the task is not directly related to the institutionally-mandated parts of their work. While the board has responsibility to guide the firm through its top management team, when the board has neither a requirement to act, through institutional pressure, or a mandate to act, through consensus of the board, then the board is less likely to act.

We also find that long-serving boards are may be more likely to engage in discretionary sustainability initiatives than boards with less time together. While this is consistent with the literature on tenure (Hambrick, 2007; Katz, 1992), the connection between the role of tenure and sustainability initiatives had not previously been explored.

These two findings may extend the UN concept of sustainability which posits that sustainability is the tradeoff between "the ability of current generations to meet their needs without compromising the ability of future generations to meet theirs" (World Commission on Economic Development, 2013: 16). Given the institutional pressures for greater board diversity, including cognitive diversity (Krus, Morgan and Ginsburg, 2012) and the institutional pressure for action on sustainability initiatives (Marshall and Brown, 2003; Prado-Lorenzo and Garcia-Sanchez, 2010; Fisher-Varden and Thorburn, 2010; Klassen and McLaughlin, 1996), firms may seek to balance these potentially conflicting social goals. Boards may engage in actions such as

expanding the size of the board to encompass directors with new experiences, values and backgrounds rather than replacing board directors. Boards may add demographically diverse directors who have low cognitive diversity from the existing board, for example selecting directors with common educational or functional backgrounds. Boards may also temper the impact of new cognitively-diverse board directors by simultaneously adding directors with low cognitive diversity. Given that new board directors joining the board together may form a cohort (Pfeffer, 1983) adding members with high and low cognitive diversity might ease the coordination difficulties between the new and seasoned directors.

There are a number of additional explanations for these results. Firms may be less likely to voluntarily disclose all of their initiatives in real time, which would require an even more retrospective methodology to collect. The methodology with which the data was gathered for this paper allows for firms to engage in important sustainability initiatives, and if they were not announced, or even announced as other than sustainability initiatives, they would not be included in this study. While the assumption is that firms would announce all of their sustainability initiatives so that they can gain the positive firm and reputational benefits (Fisher-Varden and Thorburn, 2010), we must consider the alternative that firms may want to disguise their true intention with regard to initiatives that could differentiate them from rivals.

Although other researchers have found a connection between a sustainability mindset and firm performance (King and Lenox, 2001), this sample had no significant finding. This paper attempted to find a relationship after one year (2005), after four years (2008) and over the full course of the study (2010). Given the economic downturn in the United States that was still underway in 2010, it was unlikely the performance measure was "clean" of other micro and macroeconomic effects. 2005 may have not allowed for enough time for the payback for these

discretionary initiatives, which can have longer lag times along with greater uncertainty of returns.

The signal on cognitive diversity is weaker than the signal on demographic diversity. There are demographic variables upon which almost all directors can be categorized, including gender, age and race, and these variables are discrete (as of this report there are no director who claim to be transgender) and clearly expressed. These are variables that are regularly available from multiple sources. Cognitive diversity variables are, in contrast, often not clearly expressed or discrete. Military service may indicate a strong degree of patriotism in younger directors or the bad luck of a low draft number for older directors. In either case, unless the directors have discussed their military service at some point in the media or maintains it as part of their official biography; it would be hard to know it was part of their background. Likewise religious and political beliefs are knowable only when revealed by the director. Additionally, cognitive diversity is still evolving, as evidenced by the latest Pew Research Report, which explores how values are changing in the American electorate over the past 35 years. While there is a strong affiliation between conservatism and the GOP brand and liberalism and the Democrat party, these are not universally held. Both parties are broad umbrellas and members are free to reject specific aspects of the party beliefs or re-write them within party sub-groups. Views on the environment are not universally held amongst party members and may even be situation based, varying based on the company the director keeps.

The study is also limited in that it equates all military, religious and educational experiences as similar. The viewpoints of an 80-year old director who volunteered for service as naval officer and was victorious in World War II would be very different from a 60-year old director drafted for a year of jungle fighting as an enlisted man in Vietnam, and both would have

a very different mindset from young executives who fought in the Gulf Wars. Viewpoints would also vary in the church; the Roman Catholic Church welcomes both those who attend daily service and those who are "Poinsettias," attending church on Christmas Day. Christian denominations vary widely in their interpretation on the role of institutions and even the importance of the Old and New Testament. Even the education experience wouldn't be uniform with vast changes to campuses for those who attended in the 1950s, 1970s and 1990s.

Table 2 includes some interesting results regarding the variable for duality, which was beyond the focus of the study. The mean for duality is 0.73 – 73% of firms within the sample have a CEO who also serves as the Chairman of the Board. This is lower than the Fortune 100 in which 84% of firms had CEO duality. The data from Chen, Lin and Yi (2008) suggests that firms with dual role CEOs are larger, older and with more businesses. Those results are consistent with ours. Chen et al. (2008) further suggest that duality had been decreasing since the 1990s in response to improved corporate governance even though neither they nor Dalton and Daily (2007) could find a link between duality and firm performance. Given that 73% of firms in this sample, and 84% of the Fortune 100 have CEO duality, the suggestion could be made that while the academic literature continues to consider this question, it has largely been resolved amongst practitioners.

The question for firms is how to reap the benefits of diversity, such as wider searches for solutions and greater exposure to successful initiatives from other firms, while at the same time launching discretionary sustainability initiatives and accepting the rewards that result. A recent paper by Eidelman, et al. (2012) may offer a possible explanation for why cognitive diversity dampens all meaningful activity. They offer the suggestion that people default toward conservative thought, based on their experiences and values, and that when time is short, for

example, a minor item on a crowded board agenda, directors do not engage in higher-order thinking, but rather accept thinking that is conservative in nature.

APPENDIX A

INDIVIDUAL DIRECTOR DATA COLLECTION METHODOLOGY

The dataset created for this study was the compilation of data from several independent databases. The first step in the process was downloading the corporate information available on their site for each of the firms in the Forbes 500 for 2004. Firms in the fields of financial services, insurance and those firms which were conglomerates were removed from the database, consistent with Gompers et al. (2003), via a review of SIC codes.

At this point the database was constructed in three parts. The individual director cognitive and demographic variables; the firm-level data for control variables; and the firm-level voluntary disclosures were each collected separately.

Individual Director Dataset

The IRRC Risk Metrics database of directors was downloaded for 2004 for all firms in the Risk Metrics database. This included but was not limited to the 356 firms in the database; this allowed for cross-checking of data on individual directors. For example, when a director biography was incomplete on a corporate website, the interlocking firms in the database, but not in the sample, could be checked to minimize missing values. This database provided the following information about the directors:

Name
Gender
Firm of Employment
Title
Tenure
Age
Ethnicity (although classified as Caucasian, Black, Hispanic, or Unknown)
Nationality

Many data points suffered from incomplete data on some or all variables. In some cases the "name" field, was missing as the database included only a first initial or a nickname. The database also lacked other variables of interest. In the event of a discrepancy between the IRRC database and a subsequent source, the data from IRRC was maintained.

Although the IRRC database is designed specifically for users to research board directors and corporate governance, the other datasets used in this study were not created for these purposes. As a result, there is little chance the data itself is biased. To guard against bias in collection each firm was first coded with its ranking in the Fortune 500 and that number replaced the name of the firm in the collected dataset. The directors were then sorted alphabetically by last name. This served the purpose of simultaneously allowing for the completion of director data across multiple firms and further obscuring the relationship of the directors to a focal firm. While some directors were still known to the data collectors (the author and an undergraduate student hired for data collection and data validation), the ability to collect data in a manner that would maximize or minimize a diversity score was very difficult to impossible. The two collectors worked at different times and at different computer stations and the author would randomly re-insert directors into the daily work by the other person as a check on the data. There were no discrepancies in the data, although there were director variables that one collector could find that the other could not, as this will become clearer below; and these were discussed by both collectors.

The second database accessed was the nndb.com database. The public database has the following mission (www.nndb.com/about/):

NNDB is an intelligence aggregator that tracks the activities of people we have determined to be noteworthy, both living and dead. Superficially, it seems much like a "Who's Who" where a noted person's resume is available (the usual information such as date of birth, a biography, and other essential facts.) But it mostly exists to document the connections between people, many of which are not always obvious. A person's otherwise inexplicable behavior is often understood by examining the crowd that person has been associating with. The NNDB Mapper is a visual tool for exploring the connections between people in NNDB, linking them together through family relations, corporate boards, movies and TV, political alliances, and shadowy conspiracy groups.

It builds its map by aggregating data from public sources generally on the following criteria for each person:

- Name
- Birthplace
- Gender
- Race/Ethnicity
- Sexual Orientation
- Occupation
- Nationality
- Significant family relationships
- Education
    - High School
    - College
    - Graduate School
    - School Affiliations (trustee, academic)
- Professional Experience
- Board Experience
- Community Service
- Foundations
- Interesting information (played a professional sport, arrested, is an activist)

The third database accessed for each director was located on the Federal Election Commission (FEC) public website. The database is constructed to allow verification of donor information and prevent violations of United States Election Law.

A few issues arose. Although in some cases it was necessary to validate the party affiliations of the candidates, in the vast majority of cases the party affiliation of the candidates was known. When directors gave to multiple parties across the political spectrum, the director was coded as politically active, but not conservative or liberal. This was the database that was most error-filled. For example, names were frequently misspelled (inconsequentially – multiple spelling of first names); directors were able to donate under multiple employers; and directors were in many cases in violation of donation limits. As such, the database was unfortunately the least reliable but thankfully the narrowest in scope. That said, in the event the nndb database indicated a political preference, and the FEC database had the director giving to both parties, the director was judged to be a "non-preference" individual with respect to party donations. This was done based on the specificity of the FEC database and the logic that a person who is a Republican but donates to a Democrat can not be assumed to be either a conservative or a liberal. The database includes the following information:

Name
Residency
Employer
Donations to political campaigns

If the director did not appear in the nndb.com or FEC database, the collectors conducted searches on Lexis-Nexis and in Bing. This proved a good way to capture information on

religious affiliation and military service as this produced both information about their director's private lives and the director's employer, for external directors.

APPENDIX B

VOLUNTARY DISCLOSURE DATASET COLLECTION METHOD

As with the director dataset, the voluntary disclosure dataset was compiled and validated by two individuals (the author and an undergraduate student hired for this purpose). The dataset was compiled by conducting a count of press releases for the firms identified from the Fortune 500 on each firm's website or via Lexis-Nexis in the absence of a website archive. In a few instances, there were companies who did not make any voluntary disclosures during this period.

First, 81 firms were selected as a pretest. These companies were hand-counted by the author using the title of the press release and the following definitions for each year 2004 through 2009 and the first six months of 2010:

Total Initiatives: the sum total of all press releases for that company for that year as listed on their website or found through Lexis-Nexis

Sustainability Initiatives: the sum total of all press releases for a company for a year as listed on their website or found through Lexis-Nexis (see Figure 4) that have ANYTHING to do with:

- Environmentalism (including reactions to protests/activism)

- Traditional environmental issues (recycling, waste clean-up, clean air, clean water, conservation)
- Newer environmental issues (climate change, carbon footprint)
- Any mentions of the EPA
- "Green" – unless out of environmental/sustainability context
- Alternative energy production methods
- References to environmental scoring/rating agencies or systems (Climate Leaders, Climate Counts, Climate Scoreboard, Green Ranking, GEMS)

Operational Initiatives: the sum total of Efficiency and Growth Initiatives (see figures 2 and 5).

Efficiency Initiatives: the sum total of all press releases for a company for a year listed on their website or found through Lexis-Nexis that are sustainable initiatives and indicate an attempt, or promote a past success with regard to reducing expenses or gaining efficiency (including LEED building projects). These initiatives were also considered as cost saving during the course of the study.

Growth Initiatives: the sum total of all press releases for a company for a year listed on their website or found through Lexis-Nexis that are sustainable initiatives and indicate an attempt, or promote a past success with regard to developing new business models or geographic or product diversification. These initiatives were also considered as business building initiatives during the course of the study.

Discretionary Initiatives: the sum total of all press releases for a company for a year listed on their website or found through Lexis-Nexis that are sustainable initiatives that are aspirational, such as the inclusion in climate control or improvement groups or; company-funded post-consumer recycling programs; laudatory or informational (see figures 3 and 5).

After the tabulation of these firm activities, the hired undergraduate student followed the same procedure, using these same definitions. The count of total initiatives was reconciled by simple recounts. There were few errors and both parties were able to look at the archived lists and agree on the counts. In this dataset there was one discrepancy based on the definitions. The author missed the following press release, which was added to the official tally as an efficiency initiative:

"Best Buy, Pew Climate Change Center, Best Energy Efficiency Practices"

The roles then reversed and the undergraduate student then conducted the first count of total initiatives along with the classification as growth, efficiency and other and the author conducted the second, independent count. There were some total initiatives that needed to be reconciled in addition to approximately forty sustainability initiatives that were either missed or placed in the wrong category by one counter or the other. These were reconciled by reviewing each disputed initiative together.

APPENDIX C

INDIVIDUAL ASPECTS OF COGNITIVE DIVERSITY EXPLAINED

Cognitive diversity is a construct composed of multiple aspects. Traditionally this has included education, experiences and background. Here we seek to add values, service and political activity as a way to broaden the definition. Considering each more closely, director functional background, a proxy for their professional work experiences, focuses on not just the discipline but also the firm, or firms, at which the executive worked. The greater the diversity of those director's functional backgrounds, the greater the differences in framing amongst those directors (Ramirez, 2003). While it is likely greater functional diversity would lead to greater number of options, consistent with Pfeffer (1972), the practical concern of functionally-diverse executives is finding a common language or a common framework for discussion. Likewise, different degree types and schools can also yield wide differences in understanding of the underlying science and the uncertainty of that science. Tsui and Gutek (1999) also found a direct negative relationship between education and firm performance. Much of the work on education stems from top management team upper echelon theory Hambrick, Cho and Chen (1996). In addition, Westphal and Milton (2000) and Westphal and Stern (2006) have all explored education as a component of diversity as it relates to boards. Hambrick, Cho and Chen (1996) focused solely on the underlying discipline, which seems limiting given the network effects of shared educational experiences. The connections to the university go beyond the classroom

lectures, and advanced degrees become critical for networking and status effects, as well as the knowledge the degree confers.

Stances toward charitable giving and environmental stewardship have been linked to political persuasion (Brooks, 2006). Conservatives, those who are more apt to believe in personal responsibility, minimal government involvement and the power of the free market, overwhelmingly self-identify as Republicans in the US. They are also apt respond differently to institutional pressures than Liberals, who overwhelmingly self-identify as Democrats in the US. Conservatives would be more likely to seek to avoid, defy or manipulate (Pache and Santos, 2010) institutional demands based on their belief structure. The absence of this belief structure would suggest compromise and acquiescence from the Pache and Santos (2010) framework. Religious affiliation has been linked to environmental stewardship and sacrificing of near-term goals for long-term goals (Brooks, 2006). Although this suggests that religious board directors would be more likely to be accepting of sustainability initiatives; the traditional distrust between religion and science would increase uncertainty as to the underlying science. Those who get involved (Putnam, 2000) as represented by those who choose to join/donate to a party and those who join the military, are people interested in solving problems themselves. This corresponds with avoidance, defiance and manipulation from the Pache and Santos framework (2010).

APPENDIX D

DIVERSITY DEFINITIONS

The literature has attempted to determine which form of diversity, cognitive or demographic, is more explanatory. This paper has asserted, based on Ramirez (2003) and others, that demographic diversity should have less to do with decision-making than cognitive diversity. There is no woman's math exclusive of math done by men or Hispanic science which is different than Middle Eastern, European or Oceanic. He argues the following: a Hispanic woman and a Japanese man attend the same school for their accounting degree and then are hired and trained within the same large accounting firm. At the same time two white males who have grown up in similar towns in the American South attend different schools before one joins the same firm as our first two accountants and the other opens a local practice. In solving a complex accounting decision the first, seemingly more diverse pair would be expected to recommend similar solutions. The decision would be more similar in fact than the second pair; largely due to the differences in their backgrounds, training and values, and how these influence the way they frame issues. As such, demographic differences would not be expected to help directors make decisions.

Demographic diversity also is considered "surface-level" diversity (Jackson, et al., 1995) in much of the literature. Immediate judgments are made by such characteristics as age and gender, but lasting agreements, or disagreements, are formed based on shared values and

experiences which transcend superficial differences. And yet there is much literature, discussed above, on demographic diversity and its impact on the firm.

We see that Model 1 demographic diversity has a significant and positive impact on the number of sustainable initiatives. This suggests that board directors may physically "wear" their outsider status into the boardroom. With faster turnover amongst boards, the opportunity to move beyond the superficial is limited and differences become "sticky." It may also suggest that board members who are different are advocates for minority viewpoints. Although board directors who self-identify as environmental activists are exceedingly rare (just one in my dataset); these outsider board directors may have an impact on moving the environmental initiatives forward that is much greater than the sheer number of directors would otherwise suggest.

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www.fec.com, accessed repeatedly, latest on December 19, 2011.
www.nndb.com, accessed repeatedly, latest on June 6, 2012.
www.opensecrets.org, accessed repeatedly, latest on December 19, 2011.
www.rasmussanreports.com, accessed repeatedly, latest on February 17, 2011.
http://www.people-press.org, latest on June 7, 2012.
http://www.un-documents.net/our-common-future.pdf, latest on June 12, 2013.

FIGURE 1: MODEL

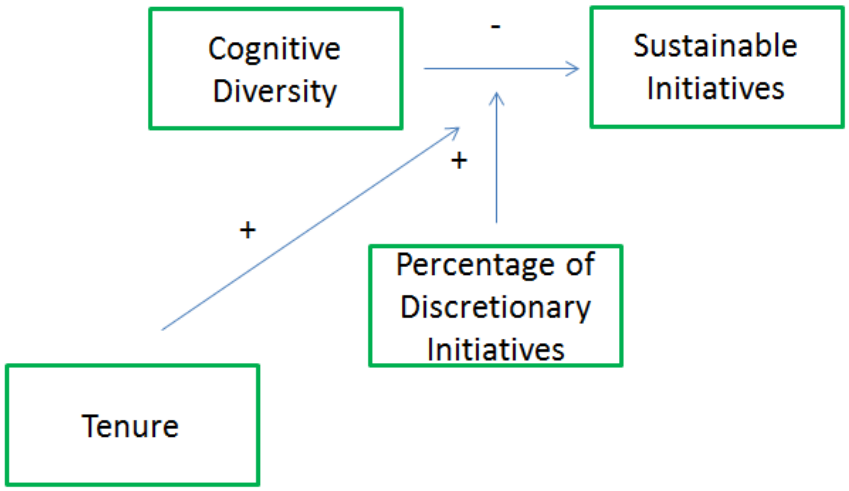

TABLE 1: DIVERSITY MEASURES

Cognitive						**Demographic**
Political	**Veteran**	**Religious**	**Education**	**Educational Level**	**Background**	
Active		Active	Elite	Doctorate	Executive	Gender
Conservative		Christian	Private	JD	Board Director	Age
Liberal		Jewish	Public	Masters	Retired	Caucasian
			No Degree	MBA	Law	African-American
				BA/BS	Finance	Other Race
				No Degree	Consulting	US Citizen
					Academic	European
					Other	Other Nationality

TABLE 2: DESCRIPTIVE STATISTICS AND CORRELATIONS

	Variables	N	Min.	Max.	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Cognitive	356	1.72	4.79	3.64	0.51	1.00																
2	Demographic	356	0.20	1.87	1.11	0.29	0.09	1.00															
3	Size	356	6.00	18.00	10.77	2.15	0.22	0.20	1.00														
4	Tenure	356	1.00	21.60	7.99	3.20	-0.02	-0.06	-0.08	1.00													
5	Revenue LN	356	8.66	11.41	10.01	0.38	0.11	0.03	0.31	-0.10	1.00												
6	Profit	356	-1.56	14.60	0.00	1.00	0.09	0.05	0.09	-0.04	0.24	1.00											
7	Employees LN	356	2.84	6.32	4.47	0.50	0.09	0.12	0.24	-0.03	0.63	0.15	1.00										
8	Pct Operational	356	0.00	1.00	0.17	0.27	0.05	0.01	0.15	-0.07	0.21	0.05	0.14	1.00									
9	Pct Discretion	356	0.00	1.00	0.42	0.41	0.02	0.03	0.17	-0.04	0.25	0.00	0.18	-0.00	1.00								
10	Operational	356	0.00	88.00	3.89	10.78	0.01	0.08	0.13	-0.04	0.33	0.10	0.25	0.36	0.12	1.00							
11	Discretionary	356	.00	324.00	9.53	25.92	-0.01	0.13	0.16	-0.03	0.36	0.16	0.28	0.08	0.31	0.67	1.00						
12	Sustainability	356	0.00	394.00	13.41	34.06	-0.01	0.12	0.16	-0.03	0.37	0.16	0.29	0.17	0.27	0.82	0.97	1.00					
13	Total Initiatives	356	0.00	4901.00	421.23	672.61	0.06	0.07	0.15	-0.12	0.44	0.15	0.33	0.17	0.23	0.44	0.48	0.51	1.00				
14	Pct. Sustain	356	0.00	0.42	0.03	0.07	0.01	0.04	0.08	0.01	0.15	0.03	0.08	0.21	0.35	0.42	0.42	0.45	-0.01	1.00			
15	EPA Incidents	356	0.00	795.00	53.71	124.20	-0.00	0.00	0.20	-0.06	0.36	0.13	0.11	0.18	0.13	0.32	0.25	0.29	0.11	0.27	1.00		
16	Climate Leaders	356	0.00	1.00	0.19	0.40	0.05	0.08	0.19	-0.02	0.20	0.02	0.20	0.20	0.24	0.34	0.24	0.29	0.23	0.14	0.15	1.00	
17	Duality	356	0.00	1.00	0.73	0.44	0.01	0.10	0.01	-0.14	0.14	0.08	0.07	0.04	0.05	-0.03	0.01	0.02	0.02	0.06	0.14	0.03	1.00
18	SIC	356	0.00	1.00	0.51	0.50	-0.08	0.07	0.08	-0.01	0.00	-0.01	-0.09	0.15	0.05	0.13	0.07	0.09	0.04	0.03	0.29	0.24	0.15

TABLE 3: FIRM-LEVEL MODELS FOR OPERATIONAL AND DISCRETIONARY INITIATIVES AND COGNITIVE DIVERSITY

	Sustainable Initiatives			
	Model 1 Controls		Model 2	
Demographic Diversity	7.64	***	7.95	***
Size	0.78		2.26	*
Tenure	5.26	***	5.67	***
Revenue LN	3.40	**	4.07	***
Profits	1.75		1.90	
Employees LN	6.96	***	6.22	***
Total Initiatives	23.23	***	23.32	***
EPA Incidents	13.73	***	12.77	***
Climate Leaders	10.80	***	10.89	**
Duality	-4.60	***	-4.08	***
SIC	1.93	*	1.98	*
Cognitive Diversity			-7.23	***
Intercept (Constant)	-3.67	***	-2.97	**
X^2	3463.29		3515.20	
dF	11		12	
Pseudo R^2	0.364		0.371	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

TABLE 4: FIRM-LEVEL MODELS FOR SUSTAINABLE INITIATIVES AND THE PERCENTAGE OF OPERATIONAL INITIATIVES AND PERCENTAGE OF DISCRETIONARY INITIATIVES

	Sustainable Initiatives						Sustainable Initiatives					
	Model 3 Controls		Model 4		Model 5		Model 6 Controls		Model 7		Model 8	
Demographic Diversity	7.64	***	7.73	***	8.17	***	7.64	***	7.73	***	8.17	***
Size	0.78		1.93		1.65		0.78		1.93		1.65	
Tenure	5.26	***	5.35	***	5.24	***	5.26	***	5.35	***	5.24	***
Revenue LN	3.40	**	4.32	***	4.26	***	3.40	**	4.32	***	4.26	***
Profits	1.75		1.21		1.50		1.75		1.21		1.50	
Employees LN	6.96	***	6.52	***	6.23	***	6.96	***	6.52	***	6.23	***
Total Initiatives	23.23	***	23.44	***	23.59	***	23.23	***	23.44	***	23.59	***
EPA Incidents	13.73	***	12.81	***	12.78	***	13.73	***	12.81	***	12.78	***
Climate Leaders	10.80	***	11.15	***	11.48	***	10.80	***	11.15	***	11.48	***
Duality	-4.60	***	-3.88	***	-4.20	***	-4.60	***	-3.88	***	-4.20	***
SIC	1.93	*	2.68	**	2.49	*	1.93	*	2.68	**	2.49	*
Cognitive Diversity			-7.04	***	0.12				-7.04	***	-7.19	***
Pct. Operational			-4.67	***	-3.72	***						
Pct. Discretionary									4.64	***	3.72	***
Cognitive Diversity X Pct. Operational					-3.09	***						
Cognitive Diversity X Pct. Discretionary											3.09	**
Intercept (Constant)	-3.67	***	-3.20	***	-2.25	*	-3.67	***	-3.66	***	-4.59	***
X^2	3463.29		3537.22		3546.71		3463.29		3537.22		3546.71	
dF	11		13		14		11		13		14	
Pseudo R^2	0.364		0.373		0.374		0.364		0.373		0.374	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

TABLE 5: FIRM-LEVEL MODELS FOR OPERATIONAL AND DISCRETIONARY INITIATIVES AND COGNITIVE DIVERSITY

	Operational Initiatives				Discretionary Initiatives			
	Model 9 Controls		Model 10		Model 11 Controls		Model 12	
Demographic Diversity	-0.98		-0.97		9.13	***	9.47	***
Size	-1.63		-1.42		0.95		2.62	**
Tenure	2.49	**	2.55	**	4.31	***	4.83	***
Revenue LN	-1.12		-1.03		4.01	***	4.55	**
Profits	-3.77	**	-3.77	**	4.53	***	4.73	***
Employees LN	4.53	***	4.44	***	5.80	***	4.86	***
Total Initiatives	12.46	***	12.48	***	19.08	***	19.31	***
EPA Incidents	9.73	***	9.46	***	7.13	***	6.45	***
Climate Leaders	8.77	***	8.76	***	3.58	***	3.73	***
Duality	-2.81	*	-2.71	*	-3.04	**	-2.54	
SIC	2.25	*	2.25	*	2.86	**	2.78	*
Cognitive Diversity			-0.66				-7.75	***
Intercept (Constant)	1.03		1.05		-5.18	***	-4.11	***
X^2	842.40		842.84		2393.14		2452.42	
dF	11		12		11		12	
Pseudo R^2	0.306		0.307		0.309		0.376	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

TABLE 6: FIRM-LEVEL MODELS FOR SUSTAINABLE INITIATIVES AND TENURE AND DISCRETIONARY INITIATIVES AND TENURE

	Sustainable Initiatives			Discretionary Initiatives		
	Model 13 Controls	Model 14	Model 15	Model 16 Controls	Model 17	Model 18
Demographic Diversity	7.57 ***	7.95 ***	8.02 ***	9.08 ***	9.47 ***	9.53 ***
Size	0.12	2.26 *	2.12 *	0.45	2.64 **	2.49 *
Revenue LN	3.30 **	4.07 ***	4.20 ***	4.07 ***	4.55 ***	4.69 ***
Profits	2.68 **	1.90	1.60	5.33 ***	4.73 ***	4.36 ***
Employees LN	7.38 ***	6.22 ***	6.30 ***	6.16 ***	4.86 ***	4.95 ***
Total Initiatives	22.63 ***	23.32 ***	23.05 ***	18.59 ***	19.31 ***	19.01 ***
EPA Incidents	13.60 ***	12.77 ***	12.77 ***	6.91 ***	6.45 ***	6.39 ***
Climate Leaders	10.88 ***	10.89 ***	10.99 ***	3.61 ***	3.76 ***	3.86 ***
Duality	-5.81 ***	-4.08 **	-4.14 **	-4.01 ***	-2.54	-2.58 *
SIC	1.83	1.98 *	1.85	2.92 **	2.78 **	2.71 **
Tenure		5.67 ***	2.42 *		4.83	2.36 *
Cognitive Diversity		-7.23 ***	-0.86		-7.75	-1.03
Tenure X Cognitive Diversity			-1.59			-1.64
Intercept (Constant)	-3.03 **	-2.97 **	-3.30 **	-4.84 ***	-4.11 ***	-4.22
X^2	3436.37	3515.20	3517.70	2374.66	2452.42	2455.07
dF	10	12	13	10	12	13
Pseudo R^2	0.362	0.371	0.371	0.341	0.353	0.353

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

FIGURE 2: FREQUENCY OF OPERATIONAL INITIATIVES BY FIRM

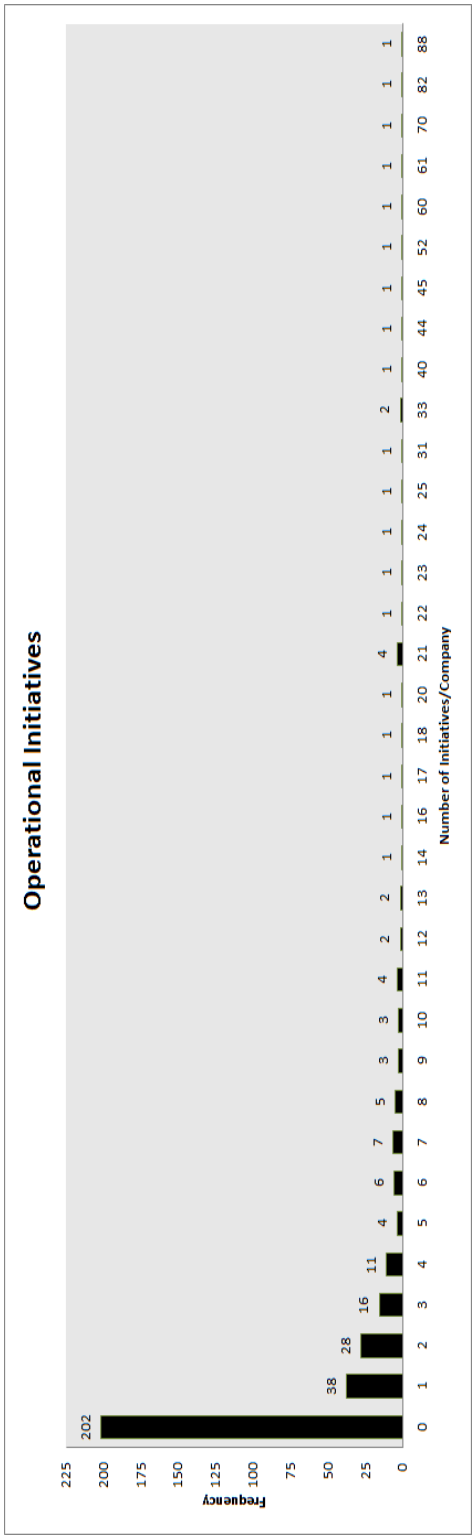

FIGURE 3: FREQUENCY OF DISCRETIONARY INITIATIVES BY FIRM

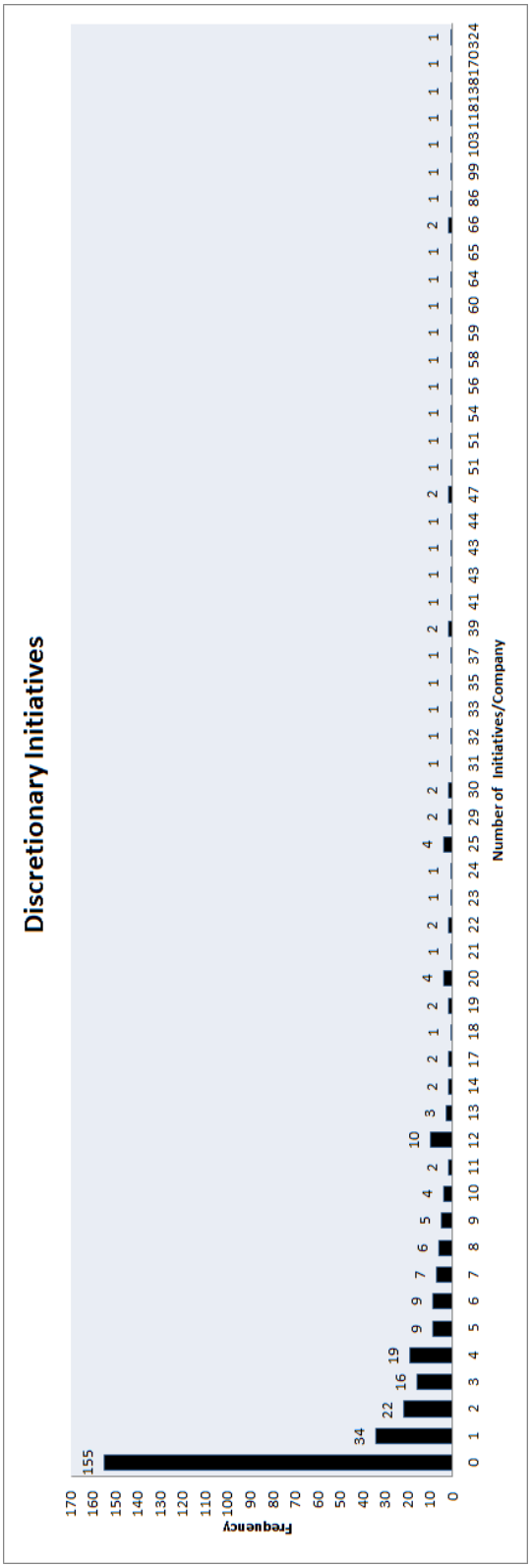

FIGURE 4: FREQUENCY OF SUSTAINABLE INITIATIVES BY FIRM

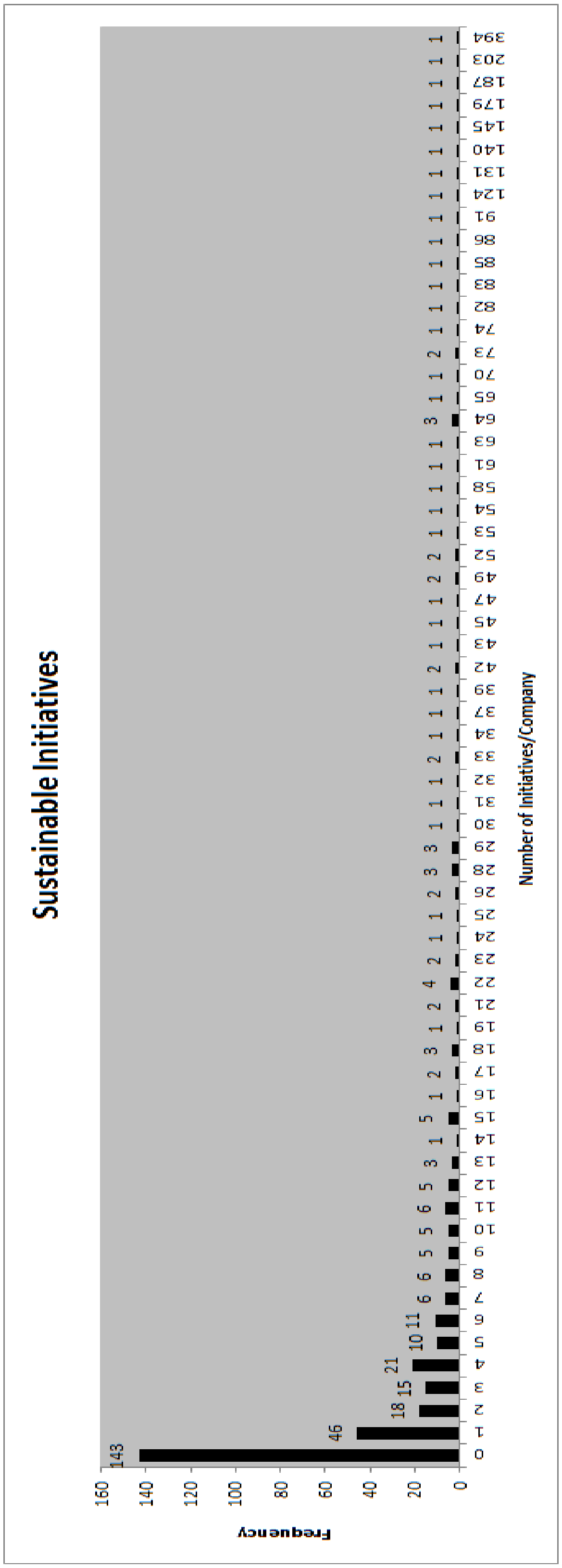

FIGURE 5: SCATTERPLOT OF FIRM OPERATIONAL AND DISCRETIONARY INITIATIVES