PUTTING THE RBV BACK INTO NRBV: A META-ANALYSIS OF MODERATING EFFECTS BETWEEN ENVIRONMENTAL STRATEGY AND FINANCIAL PERFORMANCE

Jisun Kim
Arizona State University
W. P. Carey School of Business
Department of Management and Entrepreneurship
jisun.kim.1@asu.edu

Hyun-Soo Woo
University of Mississippi
School of Business Administration
Department of Management
hwoo@bus.olemiss.edu

Rachel Balven
Arizona State University
W. P. Carey School of Business
Department of Management and Entrepreneurship
rachel.balven@asu.edu

Glenn Hoetker
Arizona State University
W. P. Carey School of Business
Department of Management and Entrepreneurship
glenn.hoetker@asu.edu

Keywords: Environmental strategy; meta-analysis; pollution prevention; pollution control; natural resource-based view (NRBV); green performance

PUTTING THE RBV BACK INTO NRBV: A META-ANALYSIS OF MODERATING EFFECTS BETWEEN ENVIRONMENTAL STRATEGY AND FINANCIAL PERFORMANCE

ABSTRACT

Theory and empirical evidence for the relationship between a firm's environmental strategy and financial performance, as well as contingencies in that relationship, remains inconsistent. The Natural Resource Based View of the firm offers an overarching framework that can help resolve this inconsistency. Leveraging its genesis in the Resource Based View, we examine environmental strategies identified by the NRBV, recasting them and previously proposed contingencies in common terms: their impact on the value and rarity of the underlying capabilities. Testing resulting hypotheses via meta-analysis of 56 studies published over a 10-year period reveals the importance of considering the type, rather than just the intensity, of environmental strategies. Additionally, conflicts in prior studies likely reflect important, but previously unrecognized, differences in the timeframes, countries, and industries examined.

INTRODUCTION

The relationship between a firm's environmental strategy and its financial performance remains unclear despite several decades of empirical studies and meta-analysis (Aragon-Correa, Marcus, & Hurtado-Torres, 2015; Berchicci, Dowell, & King, 2012). Some scholars assert that having an environmental strategy may positively impact firm performance, because such an endeavor may lead to operational efficiency, innovation, and access to crucial resources (Porter, 1991; Porter & Van der Linde, 1995). Others have argued that such efforts impose costs such as installing new equipment, changing the production process, as well as hiring and training employees, which will disadvantage the firm against rivals that avoid such costs (Friedman, 1962, 1970; Levy, 1995).

Hart and Dowell (2011) suggest that asking *when* it pays to be green, rather than *whether* it pays to be green, may benefit the literature more. In line with this approach, scholars have explored diverse contingencies suggested by stakeholder theory (e.g., Chatterji & Toffel, 2010; Russo & Fouts, 1997), the resource-based view (e.g., Darnall & Edwards, 2006), and institutional theory (e.g., Berrone & Gomez-Mejia, 2009; Darnall & Edwards, 2006) among others. Unfortunately, insights from individual papers have not coalesced to suggest an over-arching pattern explaining the relationship between environmental strategy and financial performance. Similarly, meta-analyses have not revealed systematic moderators of the relationship (Albertini, 2013; Dixon-Fowler, Slater, Johnson, Ellstrand, & Romi, 2013; Orlitzky, Schmidt, & Rynes, 2003), with some providing conflicting evidence regarding the influence of commonly studied moderators (e.g., Albertini, 2013; Dixon-Fowler et al., 2013). We believe the lack of an overarching framework is a barrier to establishing overall patterns linking environmental strategy and financial performance. In response, we ground our study in Natural Resource Based View (NRBV; Hart, 1995), an influential theory that extends the Resource Based View (RBV) approach and explains the link between environmental strategy and competitive advantage in light of the constraints and opportunities posed by the natural environment. Furthermore, different from the categories used in previous meta-analyses such as diverse environmental strategy measures (Semenova & Hassel, 2014) or simply binary categories of environmental strategies (Albertini, 2013; Dixon-Fowler et al., 2013), the

NRBV provides a theoretical approach to more accurately categorize environmental strategies. Similarly, it allows us to leverage its genesis in the RBV to recast multiple contingencies previously studied from multiple theoretical perspectives in common terms: their impact on the value and rarity of environmental strategies and their underlying capabilities.

We test our hypotheses using a meta-analysis of 193 effect sizes from 56 studies published by major research business journals in the previous 10 years. We expand on previous meta-analyses in several ways. The NRBV typology enables greater breadth and depth in our investigation than existing studies, while retaining a coherent theoretical framework. Our results, we believe, provides a more accurate and nuanced estimation of the relationship between environmental strategies and financial performance. In particular, we find that the relationship varies significantly over time and across counties as well as industries, reflecting differences in the environment-related institutional pressures firms face (Flammer, 2013).

We make three main contributions to the literature on environmental strategy and its impact on firm performance. First, we demonstrate the potential of the NRBV as theoretical grounding for future empirical studies. In the current state of the literature, the NRBV is sparsely applied despite its influence on the conceptualization of environmental strategies (Hart & Dowell, 2011). Second, we go beyond studying the *intensity* of a firm's overall environmental strategy to isolate the effects of different *types* of environmental strategies, as suggested by the NRBV. Third, we provide evidence that conflicts in prior studies reflect important, but unrecognized, differences in the timeframes, countries, and industries examined. The choice of samples used in individual papers, we suggest, is highly consequential. At the same time, the NRBV provides the means to identify generalizable patterns from the disparate results of prior studies. We build on this to make our fourth contribution, identifying opportunities for improvements and new venues for future research, for example, the value of expanding samples to include relatively clean industries (hotels, finance, etc.), which have largely been omitted from prior work, despite their growing embrace of green strategies (Scanlon, 2007).

THEORETICAL DEVELOPMENT AND HYPOTHESES

The question of '*does it pay to be green?*' so far has produced mixed empirical findings and led to conflicting perspectives. In the 1960s and 1970s, Friedman (1961, 1970) stated that environmental endeavors by firms are costly, works against shareholders' interests, and may decrease domestic firms' competitive advantages against their international rivals when an environmental strategy is forced by governmental regulations. The logic underlying this argument is that an environmental strategy may have high costs to a firm as they make changes such as installing new equipment, changing the production process, as well as hiring and training employees. Such costs may outweigh the benefits. An environmental strategy is especially disadvantageous for multinational firms that compete against other international firms that do not have to invest for such environmental causes. Scholars following this view have similarly argued that an environmental strategy reduces firms' domestic and global competitiveness, negatively affecting financial performance (Aupperle, Carroll, & Hatfield, 1985; Levy, 1995).

Subsequent scholars challenged this view by asserting that environmental strategies can actually increase firm competitiveness, positively affecting financial performance (Freeman, 1884; Porter, 1991; Porter & Van der Linde, 1995). Porter and van der Linde (1995: 98) refocus competition from static efficiency to "the capacity for innovation and improvement that shift the constraints." Because strict environmental standards demand that firms innovate more in response to restraints, the so-called "Porter hypothesis" suggests that this leads to enhanced competitiveness and thus higher financial performance. Numerous empirical studies in this vein have suggested that environmental strategies benefit firms financially via improved efficiency (King & Lenox, 2002; Russo & Fouts, 1997), access to valuable resources (Flammer, 2013), as well as appealing to new customers and markets (Hillman & Keim, 2001).

However, other empirical studies continued to find negative or non-significant environmental strategy-financial performance relationships (for reviews and meta-analyses, see Albertini, 2013; Ambec & Lanoie, 2008; Berchicci & King, 2007; Dixon-Fowler et al., 2013; Orlitzky et al., 2003). For example, Aragon-Correa et al. (2015) found that multinational firms with high financial performance had worse environmental performance compared to their peers in international settings, but had better envi-

ronmental performance compared to their competitors within their industries, indicating that environmental performance might be negatively related to financial performance across countries, but positively within an industry. Using a sample of US public firms from 1980 to 2009, Flammer (2013) also found that although investors' punishments for 'eco-harmful' behaviors of firms have increased dramatically over time, positive responses from the investors to 'eco-friendly' behaviors have also reduced. Additionally, Surroca, Tribó, and Zahra (2013) find that multinational companies facing greater institutional pressures for social responsibility in their home country transfer 'socially irresponsible' business activities to their overseas subsidiaries, suggesting that an environmental strategy may come at a cost to firms in domestic markets and negatively affect their financial performance.

McWilliams and Siegel (2000) identified several potential causes for the persistence of conflicting empirical results. Beyond theoretical and/or empirical limitations of specific papers, they argued that seemingly conflicting results reflected the failure to consider important contingencies in the environmental strategy-financial performance relationship. In line with this logic, Hart and Dowell (2011) suggested that asking *when* it pays to be green, rather than *whether* it pays to be green, would advance our understanding more meaningfully. While conceptually appealing, this approach has proven difficult to implement. Reflecting the diversity of theoretical approaches applied, including upper echelon theory, agency theory, stakeholder theory, institutional theory, the RBV, and dynamic capabilities, a plethora of contingencies have been suggested and tested. These contingencies include changes in investor reactions (Flammer, 2013), degree of stakeholder engagement (Cheng, Ioannou, & Serafeim, 2014), ownership structure (Darnall & Edwards, 2006), environmental performance measures (Delmas & Blass, 2010), and industry growth (Russo & Fouts, 1997). The resulting insights are valuable in isolation, but the same diversity of perspectives may be responsible for stifling efforts to develop an overarching logic for the relationship between environmental strategies and financial performance.

Lacking such an overarching logic, the few meta-analyses that examine this relationship have not revealed systematic patterns of how an environmental strategy relates to financial performance across varying contingencies, despite numerous methodological refinements. For example, Dixon-Fowler et al.

(2013) examine the moderating effects of various methodologically related factors: firm characteristics (large vs. small; private vs. public), industry type (heavy polluting industry vs. rest), and both environmental and financial measures (proactive vs. reactive environmental strategies; lagged financial performance vs. concurrent financial performance; accounting-based financial performance vs. market-based financial performance; self-reporting vs. archival data) and find that none of them was a significant or meaningful moderator of the environmental strategy-financial performance relationship. Albertini (2013) also meta-analyzed the moderating influences of an environmental strategy measurement (e.g., environmental management variable vs. environmental performance or disclosure variables) or financial performance measurement (e.g., accounting based financial profitability vs. the market-based performance). Additionally, these meta-analyses even find conflicting results. Specifically, while Dixon-Fowler et al. (2013) find that either using lagged financial performance or non-lagged financial performance did not significantly differentiate the environmental strategy-financial performance relationship, Albertini (2013) finds a significantly stronger relationship of environmental strategy-financial performance for non-longitudinal studies than longitudinal studies, indicating that an environmental strategy affects short-term financial performance, but not long-term financial performance.

We believe that the lack of a common theoretical framework stymies identifying systematic patterns in the environmental strategy-financial performance relationship. In response, we adopt and extend the Natural Resource Based View (Hart, 1995; Hart & Dowell, 2012) to ground our theoretical model and empirical investigation. Many papers have referenced the NRBV, usually in conjunction with other theoretical literatures. We believe, however, that the NRBV—applied rigorously and extensively—can provide the overarching logic currently absent in our understanding of the environmental strategy-financial performance relationship. This is not to suggest to other factors such as, for example, institutional factors, do not matter. Rather, we seek to demonstrate that the NRBV allows us to predict and test the impact of institutional-level factors and other contingencies via a common overarching logic.

Doing so addresses two obstacles that have impeded efforts to develop and empirically validate an overarching logic for the environmental strategy-financial performance relationship. The first is

measurement. Lacking an overall theoretical foundation, prior studies have measured environmental strategies in a multitude of ways, including overall environmental performance (Flammer, 2013), adoption of any internal environmentally related programs (e.g., audit, recycling, system installation, or ISO 14000; Du, Jian, Zeng, & Du, 2014; Walker & Wan, 2012), environmental innovation (e.g., environmentally related patents; Berrone, Fosfuri, Gelabert, & Gomez-Mejia, 2013), or as a dichotomy of pollution prevention or abatement (Berrone & Gomez-Mejia, 2009). It is very difficult to consolidate insights based on such idiosyncratic measures. By applying the NRBV's logic to categorize environmental strategies according to the capabilities on which they draw (Hart, 1995; Hart & Dowell, 2012), we overcome this difficulty by mapping the mass of seemingly distinct strategies into various broad categories (Hart & Ahuja, 1996).

The second obstacle is the diversity of theoretical explanations underlying proposed contingencies in the environmental strategy-financial performance relationship. We leverage the linkages between the NRBV and Barney's (1991) original Resource-Based View to argue that the impact of a given contingency can be understood by explicitly considering how it affects the Value, Rarity, Inimitability, and Organizational suitability (VRIO) of the capabilities underlying a firm's environmental strategy. Doing so provides a unified approach for understanding contingencies originating from diverse theoretical frameworks.

THE (NATURAL) RESOURCE BASED VIEW

The Resource Based View of the firm puts forward the idea that a firm's competitive advantage is achieved through the use of a bundle of resources at the firm's disposal (Barney, 1991, 1995). The ability of a resource or capability to generate a sustainable competitive advantage depends on the degree to which it is Valuable, Rare, Inimitable, and exploitable given the firm's Organization (VRIO). A resource is valuable when it enables the firm to seize opportunities or neutralize threats (e.g., increasing customer willingness to pay for the firm's output or reducing the firm's costs), rare when competitors do not possess the same resource, inimitable when competitors cannot easily create a similar resource, and organizationally exploitable when it is complementary to the firm's formal reporting structure, management

control systems, compensation systems, etc. (Barney, 1995). Assuming organizational exploitability, strategies based on resources and capabilities that are valuable but not rare, can provide competitive parity. The addition of rarity can provide temporary competitive advantage until competitors imitate the underlying resources and capabilities. A sustainable competitive advantage occurs only when all four criteria are met.

In 1995, Hart extended the RBV by proposing the Natural Resource Based View (NRBV), which incorporated the interaction between a firm and its natural environment. Specifically, the NRBV emphasized the need to account for the constraints that the natural environment puts on firms (Hart, 1995). Specifically, Hart argued that environmental challenges can render firms' current capabilities increasingly inefficient and ineffective. Therefore, any competitive advantage premised on value being created by these capabilities would be diminished or lost entirely. At the same time, strategies linked to capabilities that retain or gain value in the face of environmental challenges will remain or become competitively salient to the degree that they meet the remaining criteria.

The NRBV is a more complete specification of the RBV in light of natural environment. The NRBV introduces three environmentally related strategic capabilities that allow for a competitive advantage. The first capability is pollution prevention. Pollution prevention refers to business activities in the production process to reduce or prevent effluent and/or emissions (Hart, 1995; Hart & Ahuja, 1996). The assumption here is that "less waste means a better utilization of inputs which results in lower material and waste disposal costs" (Hart & Ahuja, 1996: 31). Hence, pollution prevention capability may generate a competitive advantage via superior operational efficiency and cost reduction.

The second capability is product stewardship. Product stewardship entails designing a product that has minimal environmental impact over its entire life cycle. For example, IKEA's *flat packs* require them to design products in ways they can load and ship more in one transport, and minimize packaging waste (see IKEA webpage) or SodaStream's *Bio Bottles* are made of bio-degradable materials so that they can reduce landfill pollution (see Sodastream webpage). Over time, product stewardship may result in increasing a firm's positive reputation, this, in turn, may be a source of competitive advantage.

The last capability outlined by Hart is sustainable development. This capability concerns not only limiting the environmental impact generated during the production/manufacturing process and a product's lifetime, but also improving economic and social conditions of countries that are affected by the firms' business activities. Particularly, a sustainable development strategy requires firms to realize that the business activities in developed countries are related to the poverty and natural environmental issues in developing countries, where they procure raw materials, run labor-intensive business activities, or sell the products (Hart & Ahuja, 1996). Hart (1995) states that establishing a future-oriented shared vision that incorporates global environmental conscientiousness and economic prosperity is a prerequisite to have this capability; as such, the capability in and of itself is a competitive advantage.

Although not included as a key strategic capability in Hart's NRBV framework, pollution control—activities that 'trap, store, treat, and dispose emissions and effluents' at the end of pipe stage (Hart & Ahuja, 1996)—also features in Hart's work. Because pollution control often requires "expensive and nonproductive pollution control equipment" to meet environmentally related governmental regulations, Hart argues that it is rarely conducive to either operational efficiencies or cost reduction (Hart, 1995: 992). Nonetheless, many firms still rely on pollution control and many scholarly studies include it as an environmental strategy (e.g., Berrone & Gomez-Mejia, 2009; Dixon-Fowler *et al.*, 2013). Thus, we include it among the environmental capabilities we consider, subjecting it to the identical logic as those already included in the NRBV.

TYPES OF ENVIRONMENTAL STRATEGIES AND FINANCIAL PERFORMANCE

We begin our hypothesis development by establishing that, viewed through the (N)RBV lens, environmental strategies as a general category can reasonably be assumed to be associated with greater competitiveness and, thus, superior financial performance. We then examine each of the above mentioned types of environmental strategies through the same lens, developing hypotheses regarding the strength of the relationship between the strategy and a firm's financial performance.

The case for environmental strategies—that is, strategies that are good for the environment—producing value in the RBV sense is straight-forward. Environmental protection efforts can reduce fines

and legal costs associated with violations of environmental regulations (Gunningham, Kagan, & Thornton, 2004). They can also minimize risks associated with negative environmental incidents, including reputational damage and disrupted operations (Coombs, 2007). Strategies to improve their operating efficiency by reducing waste and using input resources more efficiently may have the added benefit of reducing costs (DeSimone & Popoff, 2000). Offering environment-friendly products may increase willingness to pay among environmentally-minded customers and/or attract new consumers, increasing revenues (Kassinis & Soteriou, 2003). Because environmental strategies can generate value through the combination of reducing costs, minimizing risk and increasing revenue, we would expect them to be associated with competitive advantage. If firms using environmental strategies have a superior competitive position to those lacking such value-generating strategies, we propose a positive relationship between a firm engaging in an environmental strategy and its financial performance.

Hypothesis 1: An environmental strategy is positively associated with financial performance.

Of course, this hypothesis is only a first approximation of the relationship we expect to find. In particular, it does not incorporate the costs associated with implementing environmental strategies. However, the observed occurrence of firms pursuing more extensive environmental strategies than legally mandated minimum indicates that some firms, at least, believe the value created will exceed the costs incurred. Unless these firms are systematically mistaken, the logic of Hypothesis 1 holds. The Hypothesis 1 also does not include consideration of the other RBV conditions. According to (N)RBV logic, the competitive advantage generated by valuable environmental strategies will be small and/or transient to the degree these conditions are not met.

Despite these caveats and its straight-forward nature, Hypothesis 1 provides an important foundation for our subsequent hypotheses. It sets the stage for viewing different types of environmental strategies and various contingencies through the lens of how they affect value creation, rarity, inimitability and organizational exploitability. We next consider the relative ability of the above-discussed environmental capabilities to create competitive advantage and, thus, superior financial performance.

Pollution prevention, the NRBV's first capability, refers to activities in the production process to reduce or prevent the generation of waste that will become effluent and/or emissions. The value of pollution prevention comes primarily through cost and risk reduction. As a firm generates less pollution during production, it has less need to invest in subsequent "end-of-pipe" pollution abatement. Because fewer pollutants are generated during production, there is less risk of storage or filtering mechanisms failing catastrophically, e.g., the failure of a dike that released over 500 million gallons of fly-ash slurry from a Tennessee Valley Authority power plant in 2008 (Simone, 2008). Additionally, a pollution prevention strategy drives a firm to use input resources more efficiently, providing additional cost savings.

Pollution prevention generally requires redesigning existing production processes and routines to optimize over a new set of criteria. Firms may be discouraged from pursuing such an effort because it requires novel expertise and can be costly and disruptive, increasing the rarity of pollution prevention. Because a pollution prevention strategy is often complexly embedded in production processes, it is less likely to be imitated (Hart, 1995). In addition to knowledge barriers including causal ambiguity, inter-firm differences in production systems may make wholesale imitation of a rival's pollution prevention system impractical.

Product stewardship, the second capability of the NRBV, entails designing a product that has minimal environmental impact over its entire life cycle. That is, beyond being produced with minimal pollution, products are designed to minimize negative environmental impact during use and even after disposal. For example, 3M in France developed a new truck decking system in their transportation trucks (3M, 2008), which allows for easier loading and unloading of pallets with less product damage, reducing daily truckloads by 40% and consequently reducing waste and pollution. The system generates value for business customers, who save on transportation and fuel costs, in addition to the satisfaction of operating in a more environmentally sustainable fashion. Consumers may prefer eco-friendly products even when they experience no direct cost saving from them. For example, Kim (2013) found that such consumers prefer the more costly green electricity generated by renewable fuels over brown electricity generated by fossil fuels. This type of product differentiation and the additional willingness of customers

to pay it generates provide an additional mechanism for product stewardship to generate value, in addition to potential cost savings related to more efficient production.

Product stewardship efforts are often highly demanding, requiring coordination across design, production, distribution and marketing. Like pollution prevention, the complexity, cost, ambiguity and systematic nature of product stewardship should increase the rarity of this capability, while impeding imitation.

Sustainable development, the last strategy of the NRBV, involves practices or policies that "minimizes environmental burden of firm growth and development" (Hart, 1995: 992). Hart and Dowell (2011) emphasize that sustainable development encompasses not only direct environmental impacts but also related social and economic concerns. For example, activists accused Coca-Cola of depleting groundwater in north India where it had several bottling plants (Rana, 2016), damaging the natural environment and hurting the economies of nearby agricultural communities. In response, more than a million Indian traders boycotted Coca-Cola products (Doshi, 2017; Hincks, 2017), leading Coca-Cola to close multiple bottling plants and cancel its plans to build more facilities in the region.

As Coca-Cola's experience demonstrates, sustainable development can create value by preserving current market position and enhancing the potential for future growth opportunities. Hart (1995) argues that the long-term value of sustainable development provides a reason to firms to not pursue short-term profits at the expense of the natural environment, even in developing countries which may currently lack strong environmental regulations and expectations.

Sustainable development is the most advanced strategy among the three that Hart (1995) sets forth. It requires the most extensive changes along the firm's broad supply chains, value chains, as well as organizational culture. Therefore, a sustainable development strategy and the resources and capabilities to execute it are hard to imitate and hence are likely to be rare.

Pollution prevention, product stewardship, and sustainable development stand in contrast to pollution *control*, which seeks to minimize the impact of pollution by the trapping, storing, and treating of emissions and effluents at the end-of-pipe stage (Frosch & Gallopoulos, 1989; Willig, 1994). Pollution

control equipment, e.g., scrubbers to remove particulates and sulfur oxides from coal power plant exhaust, are often expensive and detrimental (or at best neutral) for efficiency. Because the overall production process is not redesigned to minimize the initial generation of pollution, the cost and risk reductions that accompany pollution prevention are less present in control strategies. Not only will pollution control thus generate less value, rival firms are more likely to quickly and easily imitate their competitors by installing similar systems (e.g., scrubbers, recycling systems, etc.). Such end-of-pipe pollution reduction systems are relatively independent of the whole production process and/or routines, so firms quickly install same or alternative systems at the end-of-pipe stage.

This application of RBV logic demonstrates that although each type of environmental strategy can generate value, pollution prevention, product stewardship, sustainable development strategies should generally have more value-generating potential than pollution control strategies. Additionally, they are harder and/or costlier to imitate than a pollution control strategy. Therefore, we would expect a pollution prevention, product stewardship, or sustainable development strategy to generate a larger and more sustainable competitive advantage than a pollution control strategy. Accordingly, we propose the following hypotheses.

Hypothesis 2a: A pollution prevention strategy is more positively associated with financial performance than a pollution control strategy.

Hypothesis 2b: A product stewardship strategy is more positively associated with financial performance than a pollution control strategy.

Hypothesis 2c: A sustainable development strategy is more positively associated with financial performance than a pollution control strategy.

ENVIRONMENTAL SALIENCE AS A CONTEXTUAL VARIABLE

A clear consequence of RBV logic is that the strength of a firm's resources and capabilities cannot be considered independently of the context in which the firm operates (Sirmon, Hitt, Arregle, & Campbell, 2010). A resource may generate value in one context, but not in another. Similarly, a resource

that is rare in one context may be much more common in another. To capture this effect, we investigate environmental salience in three separate contexts.

Specifically, we explore the impact of time, country, and industry on the magnitude and sustainability of competitive advantage created by an environmental strategy. We believe that they may explain inconsistencies in prior findings. Relatively few individual papers have explicitly considered variation within a specific context. Of those that have, most have made cross-national comparisons (Cheng et al., 2014). By taking advantage of the variety of contexts studied in the body of prior work, we can make comparisons that have not appeared in individual papers. If variation within these contexts significantly affects the environmental strategy/firm performance relationship, inconsistent findings may largely reflect cross-study contextual variations, the importance of which has not previously been appreciated.

Before developing hypotheses, it is useful to establish that the salience of environmental issues varies significantly within each of these contexts. Beginning with the context of time, Stalley (2010) argued that the influence of environmentally related legislation on firms increased significantly starting around the year 2000. In addition to the direct regulation, such as stricter emission standards for cars in the U.S. Barcott (2004), normative pressure from various non-governmental institutions became increasingly stronger as pressure from consumers with environmental concerns, activist groups, and other such entities pushed firms to strive for practices that reach beyond mandatory regulations (Berrone et al., 2013; King, 2008). At the same time, diverse stakeholders started to value environmental strategies more; specifically, a reputation for environmental consciousness became ever more important (Flammer, 2013; Ioannou & Serafeim, 2014). For example, using a sample of public US firms over 15 years, Ioannou and Serafeim (2014) examined the changes in analysts' perception of corporate social responsibility (CSR) and find that, in the early 1990s, analysts were more pessimistic about the values of high CRS ratings of firms, but over time, analysts gradually showed a more optimistic view on firms' CSR, issuing more positive recommendations of firms with high CSR ratings. Collectively, the evidence suggests that firms were more cognizant of the natural environmental in the 2000s than they were the 80s and 90s.

The country context is critical because most environmental regulations are established at the national level (Marcus, Aragon-Correa, & Pinkse, 2011). While environmental concerns have generally increased over time for most countries, there exist substantial country-level differences in the strength of such pressures for firms (Brechin, 1999; Dunlap & Mertig, 1997; Gelissen, 2007; Tsai & Child, 1997). The debate on *pollution havens* well represents the country-level regulatory differences (Madsen, 2009), and research finds a strong positive relationship between national income per capita and the strictness of environmental regulations (Dasgupta, Wheeler, & Mody, 1999) This indicates that economically developed countries may have more strict environmental regulations than developing countries.

Environmental salience also varies significantly across industry contexts. Evidence for this variation includes the large differences in average environmental compliance expenditures across industries (see U.S. Census Bureau Pollution Abatement Costs & Expenditures Survey[1]). Firms operating in highly polluting industries such as chemicals and power generation are likely to produce a higher (negative) environmental impact and are thus subject to greater regulatory and public pressure to address environmental issues than other industries. Accordingly, many studies of environmental strategies have gravitated towards using these industries as their samples (c.f. Bansal, 2005; Berrone & Gomez-Mejia, 2009; Clarkson, Li, Richardson, & Vasvari, 2008).

Variation along each dimension of a firm's context, we argue, affects both the value that environmental strategies can generate and rarity of the requisite resources and capabilities. We focus on these two facets of VRIO because they are the most direct linkage between context and competitive advantage. Additionally, they may be closely intertwined as we discuss.

Turning first to value creation, the RBV identifies meeting regulatory demands and satisfying stakeholder expectations as two ways a resource can create value. The former suggests that environmental strategies have greater value generating capacity in countries, industries and times that impose stricter environmental regulations. The strength of environmental regulations may also affect the latter avenue

[1] https://www.census.gov/econ/overview/mu1100.html

of value creation by increasing the salience of environmental issues to stakeholders include customers, and capital providers (Ambec & Lanoie, 2008; Bansal & Clelland, 2004)

Value creation must be weighed against the costs it imposes. Environmental strategies can be costly for firms to implement and maintain, requiring substantial investment in reducing pollution, redesigning products, the production process, restructuring divisions, or developing new human capital (Aragon-Correa, 1988; Hart & Ahuja, 1996). For instance, according to U.S. Census Bureau's Pollution Abatement Costs and Expenditures Survey, in 2005 firms in the U.S. manufacturing sector spent an average of five percent of all capital expenditures on environmental compliance; given the nature of the manufacturing businesses and how much is spent on capital, five percent is a non-trivial amount (Madsen, 2009).

Therefore, contexts in which environmental regulation is weak and/or the salience to stakeholders of environmental issues are low seem to offer relatively little upside to extensive environmental strategies. If firms face minimal legal or social sanctions for dumping untreated industrial waste into a waterway, funds invested in pollution prevention would likely generate more value if used for other business activities. In contexts where regulation is strong and/or stakeholders find environmental issues highly salient, failure to pursue environmental strategies may incur financial punishment from regulators and consumers (e.g., boycotts), increasing the net value of pursuing such strategies (Surroca et al., 2013). Accordingly, we expect that the strength of environmental regulation and salience of environmental issues to increase the value generated by environmental strategies and the requisite resources/capabilities.

However, when context increases the value of a given strategy, it increases the motivation for all firms in that context to pursue that strategy, *certeris paribis* (Oliver, 1997). When the value of an environmental strategy is more obvious to firms as is with strong environmentally related institutions, more firms may attempt adopt similar environmental strategies. To the extent that many firms can do so, the rarity of an environmental strategy will decrease. Although still valuable, environmental strategies stop providing competitive advantage and become a requirement for mere competitive parity.

So, strong environmental regulation should increase the ability of environmental strategies to generate value, which should induce many firms to pursue such strategies decreasing their rarity. Whether the combined influence of value and rarity on competitive advantage—and thus financial performance--is positive or negative depends on which of them changes more with the strength of environmentally related institutions. Unfortunately, current theory provides no clear prediction in this regard. Accordingly, we offer competing hypotheses.

H3: The relationship between environmental strategy and financial performance is stronger in (a) time periods, (b) countries, and (c) industries with high environmental salience with low environmental salience.

$H3_{alternative}$: The relationship between environmental performance and financial performance is weaker in (a) time periods, (b) countries, and (c) industries with high environmental salience than those with low environmental salience.

METHODS

Data Collection

For our meta-analysis, we took several steps in collecting articles related to environmental management strategy and financial performance.. In selecting our journal list, we adopted the lists of journals that previous meta-papers on the link between environmental strategies and financial performance used (e.g., Dixon-Fowler et al., 2013; Albertini, 2013), and then added the management journals that recent review papers included (Helfat & Martin, 2015). These searches resulted in total 42 journals[2]. Our search covered major business journals in accounting, business ethics, environmental policy, environmental innovation, management, supply chain management, and economics areas. Second, because our study focuses on environmental strategy types according to the NRBV, it was important to search for studies that examine capabilities that are referenced in the NRBV. Using Web of Science, we found that 90 percent of the studies (i.e., 801 of 890) were published after 2004.[3] Therefore, we used 2004 as the starting year for

[2] See the Appendix 2 for the journals included.
[3] This statistic is based on the analysis of citation information of Hart (1995) in Web of Science on January 27, 2016.

our search; this also allowed for us to gather 10 years of published studies. We then conducted an issue-by-issue search of the 42 journal papers. Also, to resolve the file drawer problem resulting from exclusion of unpublished studies (Rosenthal, 1979), we requested authors who presented studies about environmental strategies in the 2014 annual Academy of Management and the 2014 Strategic Management Society conferences to share unpublished studies including dissertations, and received eight unpublished studies.

Next, we excluded studies that did not include usable environmental strategy and financial performance variables, as well as studies that were meta-analytic, theoretical, lacked a correlation table, qualitative, review papers, or had overlapping data using the same variables. Ultimately, we identified a total of 193 usable samples from 56 empirical articles in 19 journals and a dissertation (See Appendix 3 for the articles).

Three researchers then independently coded a ten-percent subset of the studies as detailed below. An inter-rater reliability test indicated a 91% agreement rate; all discrepancies were subsequently resolved through discussion (Lipsey & Wilson, 2001; Perreault & Leigh, 1989).

Coding Types of Environmental Strategies

Our coding scheme for the environmental management strategies is based on Hart's (1995) NRBV. As discussed above, we added the category, pollution control, to the original categories of pollution prevention, product stewardship, and sustainable development strategies of the NRBV.

The least involved environmental strategy, pollution control, includes measures related to reducing pollution that is already generated via methods such as end-of-pipe waste treatment, disposal, and recycling. Examples of variables categorized as a pollution control strategy include the amount of toxic waste treated or recycled (e.g., Clarkson et al., 2008; Berrone & Gomez-Mejia, 2009).

Measures categorized as pollution prevention describe firm behaviors that reduce pollution by modifying the production process to minimize input usage and the production of effluent and/or emissions. Examples of variables coded as pollution prevention strategies are the changing business of pro-

cesses to reduce waste (McKeiver & Gadenne, 2005) and the extent to which a firm takes action in order to avoid waste and prevent pollution (Jayachandran, Kalaignanam, & Eilert, 2013).

We categorize measures as a product stewardship strategy, the most involved, if the variable indicates the reduction of pollution during life-cycle of a product by using clean or environmentally preferable inputs or the reduction of pollution by creating products that are environmentally friendly, such as compostable products. An example measure includes green product innovation; this type of innovation involves pollution avoidance during the product design process and the deliberate creation of products that are easy to recycle and/or reuse (Chen, Lai, & Wen, 2006).

Hart's NRBV includes the additional category of a sustainable development strategy. This capability refers to a type of practice or policy that "minimizes environmental burden of firm growth and development" (Hart, 1995: 992). In this paper, Hart (1995: 992) suggests that 'shared vision' is the key resource for this type of strategy. Following his argument, we coded measures such as 'the company has integrated its environmental plans, vision, or mission to company culture' (e.g., Chang, 2011) as sustainable development. In addition, we also coded measures as 'sustainable development' if it captures a firm's effort to "minimize environmental burden of firm's growth and development" for future generation (Hart, 1995: 1005). For instance, a composite measure that includes all items such as 'eliminated or reduced operations in environmentally sensitive locations' and 'protected claims and rights of aboriginal people or local community' is coded as sustainable development (e.g., Bansal, 2005).

Some measures did not fall into any of the aforementioned categories (e.g., aggregate measures of both environmental strengths and concerns from KLD), were too broad to characterize (e.g., a dummy variable for whether or not a firm discloses environmental information), or were environmental performance (e.g., the amount of pollution emitted). We did not categorize these into one of our strategies (i.e., categorized as 'not specified'). Table 1 offers a summary of the environmental strategy categories and measures as described here.

Insert Table 1 about here

Coding for Environmental Salience

We operationalized the effect of *time* based on findings from Flammer (2013). Her study examines the surge of "media attention and shareholder proposals related to environmental CSR" in 2000 (Flammer, 2013: 762). Therefore, we used 2000 as a focal point to separate the sample data into three groups, coded using dummy variables: (1) Year 1, for when the study used data before 2000, (2) Year 2, for when the study used data after 2000, and (3) Year 3, for when the sample study used years that span well before and well after 2000 (extended panel data). Studies with sample data that span from the early 1990s up to 2001 were grouped into the first category as it is less likely that such data reflects changing institutional pressure in 2000s.

We coded the effect of *country* according to the Environmental Performance Index's (EPI), which reflect countries' overall environmental policy and environmental performances.[4] The EPI, jointly developed by the Center for Environmental Law & Policy at Yale University and the Center for International Earth Science Information Network at Columbia University, is a weighted combination of multiple data sources including official statistics and reports from governments and international organizations, spatial or satellite data, and observations from monitoring stations. It includes two broad dimensions: environmental health, which includes the sub-dimensions of health impacts, air quality, and water & sanitation, and ecosystem vitality, which includes the sub-dimensions of water resources, agriculture, forests, fisheries, biodiversity and habitat, and climate & energy. We used a dummy variable to code articles according to the EPI of the countries used in their sample, with 0 indicating countries below the mean EPI score and 1 indicating countries above the mean EPI score. If a study's sample included multiple countries, we coded according to the average EPI of all countries included.

To capture the effect of *industry* context, we used the Environmental Protection Agency (EPA)'s Toxics Release Inventory (TRI) database to distinguish between polluting and less polluting industries. Using NAICS (North American Industry Classification System) information in TRI database, we computed an average toxic quantity released in each industry from 1987 to 2013. We then matched each in-

[4] See http://epi.yale.edu/ for more information on EPI.

dustry's average toxic quantity with industry lists in our sample. Using this information, we coded studies based on less polluting industries (e.g., healthcare, management information, market research and databank industries) as 0 and those based on polluting industries (e.g., automobile, electric power, electronics, mining, steel, and manufacturing industries) as 1.

Meta-Analytic Procedures

We followed the meta-analytic procedures provided by Hunter and Schmidt (2004), which allowed us to correct for statistical artifacts such as sampling error, measurement error, and range restriction to obtain an estimate of the true population correlation between variables of interest. We first performed weighted zero-order correlations by the sample size of the study to calculate the mean weighted correlations across studies. The standard deviations of the correlations were then calculated to estimate variation in the relationships between focal variables across studies. Second, to correct for the effects of potential measurement error, we used reported reliabilities, when given; when reliabilities were not reported, we adopted the conservative value of 0.8 as a reliability estimate (Bommer, Johnson, Rich, Podsakoff, & Mackenzie, 1995; Dalton, Daily, Ellstrand, & Johnson, 1998; Hunter & Schmidt, 2004). Third, we calculated credibility intervals using estimates of the standard deviations of the corrected effect sizes; we also calculated confidence intervals by using the standard deviations of uncorrected effect sizes weighted by respective sample sizes (Whitener, 1990). Analyzing this data allows us to draw conclusions regarding true relationships. A relationship between focal variables is present when the confidence interval using the standard error of sample-size weighted mean effect sizes does not include zero, while moderating effects may be present when the credibility interval using corrected standard deviation is large and includes zero (Dalton et al., 1998; Finkelstein, Burke, & Raju, 1995; Whitener, 1990).

To examine the effects of each moderator—environmental strategy types and the strength of the environmentally related institutional pressure—on the environmental strategy-financial performance relationship, we calculated a Q_b statistic. A moderator analyses is conducted by separating the sample into subsamples. Thus, we divided the sample of overall environmental strategy and financial performance into subgroups based on the moderators. We then compared the corrected correlations among these

groups and obtained a Q_b statistic to determine whether there is a significant difference in the magnitude of correlations among the subgroups.

RESULTS

Hypothesis 1 is our baseline predication that there is a positive relationship between environmental strategies and financial performance. We find support for this hypothesis. As shown in Table 2, the corrected mean correlation coefficient of the overall environmental strategy-financial performance relationship is 0.067, and the 95% confidence intervals (CIs) do not include 0 (lower 95% CIs=0.033; upper 95% CIs=0.075).

Hypotheses 2a, 2b, and 2c collectively predicted that more extensive environmental strategies (pollution prevention, product stewardship and sustainable development strategies respectively) would be more positively correlated with firm performance than would the least extensive strategy, pollution control. Table 2 reveals mixed results. Overall, the Q_b statistic is highly significant (Q_b=2342.05; p<0.001), providing evidence that the effects of the environmental strategies differ from one another. Looking in more detail, however, hypotheses 2a is not supported. The corrected mean correlation coefficients of the environmental strategy-financial performance relationship are 0.054 for pollution control and – 0.002 for pollution prevention. Additionally, the 95% confidence intervals for the coefficients overlap with each other and both include zero.

On the other hand, Hypothesis 2b is supported. The corrected mean correlation coefficient for a product stewardship strategy is significantly higher, 0.118 than the 0.054 found for a pollution control strategy. While its 95% confidence interval (0.004, 0.189) slightly overlaps with that of pollution control (-0.026, 0.111), the mean effect size for pollution control is not significantly different from zero while that for product stewardship is.

Lastly, our additional examination on the moderating effect of sustainable development strategy shows that sustainable development strategy is significantly related to financial performance, supporting Hypothesis 2c. The corrected mean correlation coefficient is 0.284 with 95% confidence interval of 0.067 and 0.393.

Insert Table 2 about here

Tables 3 through 5 reports the results for Hypotheses 3 and 3_{alt}, which considered the moderating effects of environmental-related institutional pressures across the context of time, country and industry. In each case, we found that context had a significant effect, although the direction of that effect differed across contexts.

Starting with the moderating effect of time, we did not find evidence of a negative moderating effect for time. In Table 3, the positive environmental strategy-financial performance relationship is significant for both samples collected after year 2000 (corrected mean correlation coefficient = 0.070; the 95% CI excludes zero) and samples collected before the year 2000 (corrected correlation = 0.126; the 95% CI excludes zero). In addition, although the magnitude of the relationship between an environmental strategy and financial performance seems to decrease over time (and the corrected mean for studies using samples spanning before and after 2000 is 0.23, but insignificant), we find that the 95% confidence intervals for both overlaps, and hence we did not find a significant difference between the environmental strategy-performance relationship over time.

Similarly, Table 4 shows that the environmental strategy-financial performance relationship is positive for both more polluting and less polluting industries, but that the effect is much weaker for polluting industries. In each case, the corrected mean correlation coefficient is positive and its 95% confidence interval excludes zero. However, the coefficient for less polluting industries, 0.341, is higher than that of polluting industries, 0.054. Additionally, the 95% confidence intervals—(0.147, 0.407) and (0.009, 0.078), respectively—do not overlap. This finding is consistent with the added value generated by environmental strategies in more polluting industries being outweighed by their decreased rarity due to more firms pursuing similar strategies.

Insert Table 3 and 4 about here

On the other hand, in Table 5, we find evidence of positive moderation meaning the environmental strategy-financial performance relationship is more positive in countries that score high on the Environmental Performance Index (EPI). In fact, we observe evidence of a positive relationship only in high EPI countries. The corrected mean correlation coefficient of the environmental strategy-financial performance relationship is 0.017 for low EPI countries and its 95% confidence interval (-0.009, 0.037) includes zero. In contrast, the corrected mean correlation coefficient for high EPI countries is 0.138 and its 95% confidence interval (0.079, 0.142) does not include zero. This result is consistent with the additional value generated by environmental strategies in high EPI countries outweighs the negative impact of decreased rarity.

Insert Table 5 about here

Our findings can be summarized as follows. At the broadest level, there appears to be a positive relationship between environmental strategies and financial performance. However, that relationship is highly contingent on the type of environmental strategy pursued. While the effects of pollution control and pollution prevention strategies are indistinguishable from zero or from each other, product stewardship and sustainable development are positively and significantly associated with financial performance.

Additionally, the effect of pursuing an environmental strategy is highly context dependent. On the one hand, environmental strategies are more positively correlated to financial performance in countries where environmental regulation is stronger and stakeholders find environmental issues more salient. On the other hand, we find a less positive relationship in highly polluting industries, where we would anticipate strong regulation and greater salience of environmental issues. Lastly, however, we find no statistically significant evidence of the diminishing environmental strategy-performance relationship over time. This may indicate that there may be a canceling out effect between the value that an environmental strategy may bring about and the rarity that subsides over time.

The mixed results regarding context are consistent with our theoretical argument that context affects both the value generating capability and the rarity of the resources and capabilities that underlie each environmental strategy. In the dimensions which value generation increases faster than it is dissipated by decreasing rarity, we see a positive moderating effect. A negative moderating effect results when the reverse is the case. Examining how the different types of environmental strategies are affected by context could provide additional insights into our results. Our sample is not large enough to fully test these three-way interactions, but we could conduct the more limited supplemental analysis below.

SUPPLEMENTARY ANALYSES

To explore how the effect of each type of environmental strategy might vary across countries with different levels of environmentally related institutional pressures, we created three sub-samples. Specifically, these sub-samples were pollution prevention, product stewardship, and a combination of pollution control and prevention[5]. As presented in Figure 1, a pollution prevention strategy is positively correlated with financial performance only in low EPI countries, while a product stewardship strategy is positively correlated with financial performance only in high EPI countries.

Insert Figure 1 about here

An obvious implication of these findings is that performance impact of different environmental strategies varies depending on how salient environmental issues in a country are. Initially, the direction of this dependence may seem counter-intuitive. However, they are more sensible when viewed through the lens of the (N)RBV. Even when pressures for environmental sustainability on firms are low, pursuing a pollution prevention strategy would generate cost benefits as Hart (1995) asserted. That is, for firms operating in countries where the pressures for adopting 'pollution prevention' practices is low, the cost advantages flowing from a more efficient production represent a source of possible value. So long as most of the firm's competitors pursued the minimal strategy of pollution control, pollution prevention capabilities would have the advantage of being rare.

[5] There was no sample for pollution control in low EPI countries.

On the other hand, if high environmental pressures encourage many companies to pursue a pollution prevention strategy, a lack of rarity means that the value generated by doing so is likely to be competed away rather than generating competitive advantage. Therefore, a firm might be better served by avoiding that cost and disruption by pursuing a pollution control strategy, so long as it could meet regulatory requirements and social expectations.

The performance advantage generated by product stewardship is significant and positive in high EPI countries is consistent with the fact that, while consumers around the world are increasingly conscious of natural environmental protection, few firms have made the necessary investments to pursue such a strategy (Ambec & Lanoie, 2008; Porter & Kramer, 2011). Those that do may be able to generate value by meeting the desires of consumers, a competitive advantage that is enhanced by the rarity of the firm's strategy.

DISCUSSION

Four decades of research have failed to reach a consistent conclusion to a simple question: "Does it pay to be green?" Even the more nuanced question of "When does it pay to be green?" has yet to yield a consistent answer. We seek to demonstrate that fully leveraging the linkages between Hart's (1995) Natural Resource Based View and Barney's (1991) original Resource-Based View, can provide an overarching logic currently absent in our understanding of the environmental strategy-financial performance relationship.

Despite its conceptual influence, we believe the NRBV is underutilized in empirical work (Hart & Dowell, 2011). Our first contribution is demonstrating the empirical tractability of the NRBV and its ability to provide a unifying framework for many of the contingencies previously considered only from distinct theoretical frameworks. While our application was a meta-analysis of prior literature, we believe the greatest potential of the NRBV is to shape the design future studies, a point we will discuss below.

Our second contribution is to empirically verify the importance of recognizing the diversity of environmental strategies a firm can pursue. Considering all environmental strategies, we found a positive correlation with financial performance. However, a finer-grained examination revealed no relationship

between the most reactive strategy, pollution control, and improved financial performance, consistent with such "end of pipe" measures imposing costs, generating minimal value and being commonplace among competitors. Contrary to our expectations, we found that the more proactive strategy of pollution prevention was also not associated with higher financial performance, despite the potential cost savings from an optimized production process. Only product stewardship (and sustainable development) strategies were associated with higher financial performance.

These general findings are subject to important contextual contingencies, of which we considered three: time, industry, and country. We found that environmental strategies as a whole generate positive financial performance only in environmentally demanding countries. Also, although environmental strategies are positively correlated with financial performance in both low and high polluting industries, the effect is significantly weaker for highly polluting industries. Lastly, we found no support for the time effect. While we had a reason for choosing the year 2000, it could be that the year 2000 was not the right split. So, we did an additional test with sample split at different year (i.e., 2006), but we found similar results[6]. Perhaps the value of environmental strategies in general has not decreased as much over the last 15-20 years.

Although constrained by our sample, our supplementary analysis provided additional insights. Pollution prevention strategies were positively associated with financial performance in less environmentally demanding countries, while product stewardship related financial performance in environmentally demanding countries.

It is intriguing that product stewardship was associated with higher financial performance only in environmentally demanding countries. A tentative interpretation of this finding is that environmental strategies generate greater value through increased stakeholder (especially customer) satisfaction than through cost savings (Cho, Guidry, Hageman, & Patten, 2012), as it is the most extensive and costly environmental strategy we considered. Customers will generally be unaware of whether a firm is merely

[6] We followed the adjusted p-values for the two-way interaction using the Sidak/Bonferroni correction, and found similar results (environmental strategies were significant regardless of the year we picked for split). Specifically, the Q_p value is less than .0001 for both before and after 2006.

controlling the pollution it generates or actively preventing (or at least minimizing) its initial production. Product stewardship, on the other hand, is highly visible to the customer and other stakeholders. That said, when stakeholders (e.g., consumers) are environmentally demanding, a product stewardship strategy and the resulting (visibly 'green') products and services may deliver more values to the stakeholders than when the stakeholders in a country on average is not environmentally demanding.

Our meta-analysis could more thoroughly incorporate these contingencies into the analysis than most individual papers. Doing so leads to our third contribution, providing evidence that inconsistency in the existing literature may reflect unrecognized differences in the strategies and contexts studied. Since environmental strategies are not uniformly associated with financial performance, conflicting results may simply reflect differences in the strategies studied. Even when similar strategies are studied, contextual contingencies may lead to conflicting findings. While cross-country effects have been studied at same depth, we found few papers that compared the performance of environmental strategies as a function of the industry in which firms operated.

Fortunately, the NRBV allows us to extract generalizable patterns from past studies. As we have demonstrated, each of the strategies we examined can be understood in terms of whether the underlying resources and capabilities are VRIO: valuable, rare, hard to imitate and embedded in a firm that is organized to take exploit them. Similarly, the impact of any contextual contingencies we examined can be understood in terms of how it changes the VRIO profile of the resources/capabilities underlying an environmental strategy.

Applying the (N)RBV lens to the existing literature suggested a potential resolution to theoretical and empirical contradictions. It also brought into focus important unresolved questions and new research directions. These constitute our final contribution.

Hart's (1995) typology of environmental strategies includes sustainable development, not only limiting the environmental impact generated during the production/manufacturing process and a product's lifetime, but also improving economic and social conditions of countries that are affected by the firms' business activities. Regardless of the relatively small number of effects (k= 6), our analysis provides

an insight on the nature of the relationship. Particularly since we found a significant positive association between financial performance and sustainable development, we see it as an important area for future research.

Furthermore, Hart's typology does not include the pollution control as a strategy, although he discusses activities such "trap, store, treat, and dispose" extensively. Since pollution control strategies among firms and in our sample of articles is prevelant, we extended Hart's typology to include it, taking advantage of the unifying framework provided by the (N)RBV. Indeed, we believe that this is a useful addition to the typology of environmental strategies as many organizations utilize this strategy. Consistent with Hart's (1995) assertion, general findings from our analysis suggest that a pollution control strategy (end-of-pipe control) might not generate competitive advantage (financial performance) as increasing demands for firms go beyond mere pollution control.

Importantly, our findings on this point contrast with those found in a recent meta-analysis by Dixon-Fowler *et al.* (2013). Dixon-Fowler and co-authors concluded that both pollution control and more proactive strategies positively affect financial performance and had similar effect sizes. The difference may reflect a difference in the time frames considered. Dixon-Fowler et al. used studies that spanned from 1970 to 2009, while we used studies from 2004 to 2014. Regardless, the discrepancy has significant managerial and policy implications and merits further examination.

The difference between our results and those of Dixon-Fowler et al. draws attention to the previously underappreciated role of time. Most firms in 70s to 90s might have used compliance strategies (e.g., following regulations and use end-of-pipe strategies). Since 2000s, however, the increasing regulatory and social attention to environmental issues may have increased the value that environmental strategies could generate, but by spurring more firms to pursue such strategies, these same forces made them less rare, reducing their ability to generate competitive advantage. While this explanation is theoretically consistent, our crude separation of history into pre- and post-2000 might not clearly capture many changes. It would be helpful for future studies to study the complex interplay of value and rarity. Furthermore, whatever the detailed cause may be, the effect of environmental demands (reflected in the

country and industry) we observe suggests that based on contexts must be carefully re-examined. Taken together, the managerial implication is that environmental capabilities that brought financial benefits in a certain environment may not continue to do so based on the interplay of value and rarity.

Of course, time, industry and country are only three of the contextual variables that may affect the financial implications of environmental strategies. Applying the criteria of either Hunter, Schmidt, and Jackson (1982)or Whitener (1990)/Koslowsky and Sagie (1993) to our results in Table 2 suggests a strong possibility that there are additional moderators influencing the environmental strategy-financial performance relationship. The (N)RBV offers a unifying framework for moderators suggested by diverse theoretical literatures.

Lastly, our search of the published literature revealed only a narrow set of studies on environmental strategies in "clean" industries. We believe this is an important area for future study for two reasons. First, our findings, although limited by the relative dearth of articles, suggest that firms in low polluting industries can generate financial benefit environmental strategies, although modest efforts may be the most rewarding. More importantly, many firms in clean industries are deploying environmental strategies. For example, many hotel industry have adopted environmentally friendly management practices such as paperless conferences or towel reuse programs (Scanlon, 2007).

The question, "Does it pay to be green?" has never been more relevant to managers, policy makers and the general public. We are keenly aware that ours is yet one more paper in the massive body of research that has tried to answer that question. Nevertheless, we believe that we have been able to make a significant contribution to clarifying the existing literature and empowering future work. We look forward to the discussions and research that we may have inspired through our work.

REFERENCES

3M. 2008. Sustainability progress.

Albertini, E. 2013. Does environmental management improve financial performance? A meta-analytical review. ***Organization & Environment***, 26(4): 431-457.

Ambec, S., & Lanoie, P. 2008. Does it pay to be green? A systematic overview. ***Academy of Management Perspectives***, 22(4): 45-62.

Aragon-Correa, J. A. 1988. Strategic proactivity and firm approach to the natural environment. ***Academy of Management Journal***, 41(5): 556-567.

Aragon-Correa, J. A., Marcus, A., & Hurtado-Torres, N. 2015. The natural environmental strategies of international firms: Controversies and new evidence on performance and disclosure. ***The Academy of Management Perspectives***: amp. 2014.0043.

Aupperle, K. E., Carroll, A. B., & Hatfield, J. D. 1985. An empirical examination of the relationship between corporate social responsibility and profitability. ***Academy of Management Journal***, 28(2): 446-463.

Bansal, P. 2005. Evolving sustainably: A longitudinal study of corporate sustainable development. ***Strategic Management Journal***, 26(3): 197-218.

Bansal, P., & Clelland, I. 2004. Talking trash: Legitimacy, impression management, and unsystematic risk in the context of the natural environment. ***Academy of Management Journal***, 47(1): 93-103.

Barcott, B. 2004. Changins all the rules, ***The New York TImes Magazine***: The New York TImes.

Barney, J. B. 1991. Firm resources and sustained competitive advantage. ***Journal of Management***, 17(1): 99-120.

Barney, J. B. 1995. Looking inside for competitive advantage. ***The Academy of Management Executive***, 9(4): 49-61.

Berchicci, L., Dowell, G., & King, A. A. 2012. Environmental capabilities and corporate strategy: Exploring acquisitions among us manufacturing firms. ***Strategic Management Journal***, 33(9): 1053-1071.

Berchicci, L., & King, A. 2007. Postcards from the edge: A review of the business and environment literature. ***Academy of Management Annals***, 1(1): 513-547.

Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L. R. 2013. Necessity as the mother of 'green' inventions: Institutional pressures and environmental innovations. ***Strategic Management Journal***, 34(8): 891-909.

Berrone, P., & Gomez-Mejia, L. R. 2009. Environmental performance and executive compensation: An integrated agency-institutional perspective. ***Academy of Management Journal***, 52(1): 103-126.

Bommer, W. H., Johnson, J. L., Rich, G. A., Podsakoff, P. M., & Mackenzie, S. B. 1995. On the interchangeability of objective and subjective measures of employee performance: A meta-analysis. ***Personnel Psychology***, 48(3): 587-605.

Brechin, S. R. 1999. Objective problems, subjective values, and global environmentalism: Evaluating the postmaterialist argument and challenging a new explanation. ***Social Science Quarterly***: 793-809.

Chatterji, A. K., & Toffel, M. W. 2010. How firms respond to being rated. ***Strategic Management Journal***, 31(9): 917-945.

Chen, Y.-S., Lai, S.-B., & Wen, C.-T. 2006. The influence of green innovation performance on corporate advantage in taiwan. ***Journal of Business Ethics***, 67(4): 331-339.

Cheng, B., Ioannou, I., & Serafeim, G. 2014. Corporate social responsibility and access to finance. ***Strategic Management Journal***, 35(1): 1-23.

Cho, C. H., Guidry, R. P., Hageman, A. M., & Patten, D. M. 2012. Do actions speak louder than words? An empirical investigation of corporate environmental reputation. ***Accounting, Organizations and Society***, 37(1): 14-25.

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. 2008. Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. ***Accounting, Organizations and Society***, 33(4): 303-327.

Coombs, W. T. 2007. Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. ***Corporate Reputation Review***, 10(3): 163-176.

Dalton, D. R., Daily, C. M., Ellstrand, A. E., & Johnson, J. L. 1998. Meta-analytic reviews of board composition, leadership structure, and financial performance. ***Strategic Management Journal***, 19(3): 269-290.

Darnall, N., & Edwards, D. 2006. Predicting the cost of environmental management system adoption: The role of capabilities, resources and ownership structure. ***Strategic Management Journal***, 27(4): 301-320.

Dasgupta, S., Wheeler, D., & Mody, A. 1999. Environmental regulation and development: A cross-country empirical analysis. ***World Bank Policy Research Working Paper***(1448).

Delmas, M., & Blass, V. D. 2010. Measuring corporate environmental performance: The trade-offs of sustainability ratings. ***Business Strategy and the Environment***, 19(4): 245-260.

DeSimone, L. D., & Popoff, F. 2000. ***Eco-efficiency: The business link to sustainable development***: MIT press.

Dixon-Fowler, H. R., Slater, D. J., Johnson, J. L., Ellstrand, A. E., & Romi, A. M. 2013. Beyond "does it pay to be green?" a meta-analysis of moderators of the cep–cfp relationship. ***Journal of business ethics***, 112(2): 353-366.

Doshi, V. 2017. Indian traders boycott coca-cola for 'straining water resources': The Guardian.

Du, X., Jian, W., Zeng, Q., & Du, Y. 2014. Corporate environmental responsibility in polluting industries: Does religion matter? ***Journal of Business Ethics***, 124(3): 485-507.

Dunlap, R. E., & Mertig, A. G. 1997. Global environmental concern: An anomaly for postmaterialism. ***Social Science Quarterly***: 24-29.

Finkelstein, L. M., Burke, M. J., & Raju, M. S. 1995. Age discrimination in simulated employment contexts: An integrative analysis. ***Journal of Applied Psychology***, 80(6): 652-663.

Flammer, C. 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. ***Academy of Management Journal***, 56(3): 758-781.

Freeman, R. E. 1884. ***Strategic management: A stakeholder approach***. Boston: Pitman.

Friedman, M. 1961. The lag in effect of monetary policy. ***The Journal of Political Economy***: 447-466.

Friedman, M. 1962. ***Capitalism and freedom***: University of Chicago Press.

Friedman, M. 1970. The social responsibility of business is to increase its profits, ***The New York Times Magazine***: 122-124: The New York Times Company.

Frosch, R. A., & Gallopoulos, N. E. 1989. Strategies for manufacturing. ***Scientific American***, 261(3): 144-152.

Gelissen, J. 2007. Explaining popular support for environmental protection a multilevel analysis of 50 nations. ***Environment and Behavior***, 39(3): 392-415.

Gunningham, N., Kagan, R. A., & Thornton, D. 2004. Social license and environmental protection: Why businesses go beyond compliance. ***Law & Social Inquiry***, 29(2): 307-341.

Hart, S. L. 1995. A natural-resource-based view of the firm. ***Academy of management review***, 20(4): 986-1014.

Hart, S. L., & Ahuja, G. 1996. Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. ***Business strategy and the Environment***, 5(1): 30-37.

Hart, S. L., & Dowell, G. 2011. Invited editorial: A natural-resource-based view of the firm fifteen years after. ***Journal of Management***, 37(5): 1464-1479.

Helfat, C. E., & Martin, J. A. 2015. Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. ***Journal of Management***, 41(5): 1281-1312.

Hillman, A. J., & Keim, G. D. 2001. Shareholder value, stakeholder management, and social issues: What's the bottom line? ***Strategic Management Journal***, 22(2): 125-139.

Hincks, J. 2017. Why traders in this south indian state are shunning coca-cola and pepsi: TIME.

Hunter, J. E., & Schmidt, F. L. 2004. ***Methods of meta-analysis: Correcting error and bias in research findings*** (2nd ed.). Thousand Oaks, CA: Sage.

Hunter, J. E., Schmidt, F. L., & Jackson, G. B. 1982. Integrating research findings across studies, ***Aeta-analysis: Cumulating research findings across studies***: 12-27. Beverly Hills: Sage.

Ioannou, I., & Serafeim, G. 2014. The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. ***Strategic Management Journal***, 36(7): 1053-1081.

Jayachandran, S., Kalaignanam, K., & Eilert, M. 2013. Product and environmental social performance: Varying effect on firm performance. ***Strategic Management Journal***, 34(10): 1255-1264.

Kassinis, G. I., & Soteriou, A. C. 2003. Greening the service profit chain: The impact of environmental management practices. ***Production and Operations Management***, 12(3): 386-403.

Kim, E.-H. 2013. Deregulation and differentiation: Incumbent investment in green technologies. ***Strategic Management Journal***, 34(10): 1162-1185.

King, A., & Lenox, M. 2002. Exploring the locus of profitable pollution reduction. ***Management Science***, 48(2): 289-299.

King, B. G. 2008. A political mediation model of corporate response to social movement activism. ***Administrative Science Quarterly***, 53(3): 395-421.

Koslowsky, M., & Sagie, A. 1993. On the efficacy of credibility intervals as indicators of moderator effects in meta-analytic research. ***Journal of Organizational Behavior***, 14(7): 695-699.

Levy, D. L. 1995. The environmental practices and performance of transnational corporations. ***Transnational Corporations***, 4(1): 44-67.

Lipsey, M. W., & Wilson, D. B. 2001. ***Practical meta-analysis***. Thousand Oaks, CA: Sage.

Madsen, P. M. 2009. Does corporate investment drive a "race to the bottom" in environmental protection? A reexamination of the effect of environmental regulation on investment. ***Academy of Management Journal***, 52(6): 1297-1318.

Marcus, A., Aragon-Correa, J. A., & Pinkse, J. 2011. Firms, regulatory uncertainty, and the natural environment. ***California Management Review***, 54(1): 5-16.

McKeiver, C., & Gadenne, D. 2005. Environmental management systems in small and medium businesses. ***International Small Business Journal***, 23(5): 513-537.

McWilliams, A., & Siegel, D. S. 2000. Corporate social responsibility and financial performance: Correlation or misspecification? ***Strategic Management Journal***, 21(5): 603-609.

Oliver, C. 1997. Sustainable competitive advantage: Combining institutional and resource-based views. ***Strategic Management Journal***, 18(9): 697-713.

Orlitzky, M., Schmidt, F. L., & Rynes, S. L. 2003. Corporate social and financial performance: A meta-analysis. ***Organization Studies***, 24(3): 403-441.

Perreault, W. D., Jr., & Leigh, L. E. 1989. Reliability of nominal data based on qualitative judgments. ***Journal of Marketing Research***, 26(2): 135-148.

Porter, M. E. 1991. Towards a dynamic theory of strategy. ***Strategic Management Journal***, 12: 95-117.

Porter, M. E., & Kramer, M. R. 2011. The big idea: Creating shared value. ***Harvard Business Review***, 89(1): 2.

Porter, M. E., & Van der Linde, C. 1995. Toward a new conception of the environment-competitiveness relationship. ***The Journal of Economic Perspectives***, 9(4): 97-118.

Rana, P. 2016. Coca-cola closes plant in india, ***The Wall Street Journal***.

Rosenthal, R. 1979. The file drawer problem and tolerance for null results. ***Psychological Bulletin***, 86(3): 638.

Russo, M. V., & Fouts, P. A. 1997. A resource-based perspective on corporate environmental performance and profitability. ***Academy of Management Journal***, 40(3): 534-559.

Scanlon, N. L. 2007. An analysis and assessment of environmental operating practices in hotel and resort properties. ***International Journal of Hospitality Management***, 26(3): 711-723.

Semenova, N., & Hassel, L. 2014. On the validity of environmental performance metrics. ***Journal of Business Ethics***: 1-10.

Simone, S. J. 2008. Tennessee sludge spill runs over homes, water, ***CNN***, December 24, 2008 ed.

Sirmon, D. G., Hitt, M. A., Arregle, J. L., & Campbell, J. T. 2010. The dynamic interplay of capability strengths and weaknesses: Investigating the bases of temporary competitive advantage. ***Strategic Management Journal***, 31(13): 1386-1409.

Stalley, P. 2010. ***Foreign firms, investment, and environmental regulation in the people's republic of china***: Stanford University Press.

Surroca, J., Tribó, J. A., & Zahra, S. A. 2013. Stakeholder pressure on mnes and the transfer of socially irresponsible practices to subsidiaries. ***Academy of Management Journal***, 56(2): 549-572.

Tsai, S. H. T., & Child, J. 1997. Strategic responses of multinational corporations to environmental demands. ***Journal of General Management***, 23: 1-22.

Walker, K., & Wan, F. 2012. The harm of symbolic actions and green-washing: Corporate actions and communications on environmental performance and their financial implications. ***Journal of Business Ethics***, 109(2): 227-242.

Whitener, E. M. 1990. Confusion of confidence intervals and credibility intervals in meta-analysis. ***Journal of Applied Psychology***, 75(3): 315.

Willig, J. T. 1994. ***Environmental tqm***: McGraw-Hill New York.

Table 1. Categorization of environmental management strategy content

Measure of environmental strategy	Indicators
Pollution control (Hart, 1995)	The amount of chemicals recycled, treated on site, and transferred to other locations for further treatment (e.g., Berrone & Gomez-Mejia, 2009) The amount of toxic waste treated or recycled (e.g., Clarkson et al., 2008))
Pollution prevention (Hart, 1995)	Production process to reduce raw materials consumed and waste (e.g., Menguc, Auh, & Ozanne, 2010; Darnell & Deward, 2006) Production process to reduce the emission of hazardous substances (e.g., Menguc, Auh, & Ozanne, 2010) Limit the use of materials or products that damage environment (e.g., Menguc, Auh, & Ozanne, 2010) Estimation of real waste value that happend during the process compared with the total waste generated (e.g., Berrone & Gomez-Mejia, 2009)
Product stewardship (Hart, 1995)	Develop products or materials of products which are recyclable, reusable and decomposable (e.g., Chang, 2011; Zhu & Sarkis, 2004) Develop products or materials of products consuming less energy and resources (e.g., Chang, 2011; Zhu & Sarkis, 2004) Develop products or services in compliance with the environmental desires of a firm's customers (e.g., Chen, 2008)
Sustainable development (Hart, 1995)	Shared vision of future (deliver environmentally related benefits to third world countries; recognizing the connectedness of the natural environment across countries and develop related competencies) (e.g., Chang, 2011) All three principles of (1) environmental integrity (e.g., reduced environmental impacts of production processes), (2) economic prosperity (e.g., reduced costs of inputs for same level of outputs), and (3) social equity (e.g., considered interests of stakeholders in investment decisions by creating a formal dialogue) (e.g., Bansal, 2005)