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## The product-market performance benefits of environmental policy: Why customer awareness and firm innovativeness matter

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**The product-market performance benefits of environmental policy:  
Why customer awareness and firm innovativeness matter**

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## **The product-market performance benefits of an environmental policy: Why customer awareness and firm innovativeness matter**

**Abstract:** *Researchers have widely studied the nexus between corporate environmental ('green') policy and its green performance and firm financial performance, but with mixed findings. A potential explanation for these mixed findings is the focus of extant studies on the direct and immediate impact of environmental performance on financial performance to the exclusion of firm-specific boundary conditions. Furthermore, all prior research study the effect of environmental performance on either stock market-based performance measures (i.e. stock return) or accounting-based performance measures (i.e. ROA). A missing third dimension of firm performance, product-market-based performance (i.e. market share) has so far remained unexplored despite representing a crucial objective when innovating. Using Newsweek's annual green ranking as a novel measure of environmental performance for a panel of U.S. firms from 2010 to 2015, this paper attempts to fill these voids in the literature. The results show a positive relationship between firms' environmental performance and market share as a measure of product-market-based performance. The findings further demonstrate that this relationship is positively moderated by the level of customer awareness and innovativeness of the firm: the higher the level of awareness of a firm's environmental credentials and innovativeness, the stronger the effects of environmental performance on market share. Our results are robust against endogeneity concerns and alternative measures of firm financial and environmental performance.*

**Keywords:** customer awareness, environmental performance, innovativeness, market share, green, environmental policy, sustainability strategy, stakeholder engagement.

## 1. Introduction

In response to growing pressures from various their stakeholders, firms across various industries now increasingly adopt a broad spectrum of pro-environment initiatives such as the introduction of green products and processes (Rueda-Manzanares, Aragón-Correa, & Sharma, 2008; Pekovic & Rolland, 2016; Oh, Bae, Currim, Lim, & Zhang, 2016; Sun & Price, 2016; Borhan & Hooks, 2016; Arena, Michelin, & Trojanowski, 2018; Khurshid, Park, & Chan, 2019). In light of these environmentally-focused activities, scholars from several disciplines including management, finance, accounting, economics and marketing have rushed to study the link between corporate environmental performance and firm financial performance (Horváthová, 2010; Walker & Wan, 2012; Dixon-Fowler, Slater, Johnson, Ellstrand, & Romi, 2013; Endrikat, 2016; Feng et al., 2018; Arda, Bayraktar, & Tatoglu, 2019). However, it is nearly impossible to draw a definite conclusion based on the extant literature; several studies have shown that better environmental (green) performance positively impacts firm financial performance, but several studies have also shown the exact opposite (Horváthová, 2010; Dixon-Fowler et al., 2013; Endrikat, 2016; Hang, Geyer-Klingeborg, & Rathgeber, 2019). This leaves strategic managers with puzzling dilemma: why and when is environmental policy beneficial to firm performance, and when is it not?

Extant studies suffer from two significant limitations (Wagner, 2005; Horváthová, 2010; Dixon-Fowler et al., 2013). First, no study thus far has explored the nexus between green performance and product–market-based firm performance measures such as market share. That is, all extant studies examined the impact of environmental performance on either stock market-based firm performance measures such as stock return or accounting-based firm performance measures such as return on assets (ROA). Firm performance is a multidimensional construct, and its three preeminent dimensions are stock market-based performance measures, accounting-based performance measures and product–market-based performance measures (Richard, Devinney, Yip, & Johnson, 2009; Carton & Hofer, 2010; Steenkamp & Fang, 2011). We contend that product–market performance matters more for environmental policy precisely because initiatives around green products and process activities are geared towards improving the firm’s position towards market-based stakeholders. Second, the mixed findings of earlier can be further attributed to an absence of firm-specific boundary conditions. Several scholars have called for examination of how boundary conditions affect the link between green performance and firm performance (Horváthová, 2010; Dixon-Fowler et al., 2013), with firm-specific contingencies specifically identified as a possible solution to disentangling the mixed findings of earlier studies (Albertini, 2013; King & Lenox, 2001). Firm-specific boundary conditions potentially matter because they affirm or distract the alignment between the firm’s environmental policy and its initiatives on which the firm’s green performance is based on and its firm performance objectives.

Drawing on instrumental stakeholder theory (Jones, 1995; Jones, Harrison, & Felps, 2018), we argue that an instrumental approach to stakeholder management will enable a firm to better understand and fulfill the explicit and implicit obligations it has with its stakeholders about the utilization and preservation of the natural environment. This should lead to better product–market-based performance as measured by market share. Furthermore, based on instrumental stakeholder theory and the contingency

perspective, we argue that firm-specific boundary conditions will accentuate or attenuate the relationship between environmental performance and product–market-based performance. In keeping with the instrumental stakeholder theory, this study incorporates two contingency factors, namely, the level of customer awareness about firms’ environmental initiatives and firm innovativeness. Instrumental stakeholder theory argues that firms tend to disseminate information about their pro-environmental initiatives to their customers to reap benefits in the form of better market-based performance (i.e. better market share). In essence, firms tend to use better green performance achieved through its environmental policy as an instrument to improve market-based performance by way of keeping existing and potential customers informed about the fulfillment of their social and environmental obligations. Moreover, customers’ awareness about firms’ socially responsible initiatives has been shown to impact the link between corporate social performance and firm performance (Servaes & Tamayo, 2013). However, heterogeneity among firm’s capability to manage various aspects of their operations, such as innovation capability, is thought to impact the nexus between environmental performance and firm performance. Specifically, we argue that firms that use environmental activities as instruments for stakeholder relationship management will tend to stress on firm innovativeness because customers consider both the environmental as well as non-environmental aspects of a product in their buying decisions. Furthermore, firm innovativeness influences the direction and strength of the relationship between firm strategies and performance (Kotabe, Srinivasan, & Aulakh, 2002; Rubera & Kirca, 2012). This study, therefore, also includes firm innovativeness as a second contingency factor in the relationship between environmental performance and firm performance.

This study makes two important and timely contributions to the literature. First, this study investigates and demonstrates that firms that use environmental activities as *instruments* for managing relationships with stakeholders benefit from their green performance in terms of market share, an important product–market-based performance variable omitted from earlier studies. This finding, therefore, extends those of prior studies by providing robust empirical evidence on an essential dimension of firm performance. Second, this study provides theory and empirical evidence as to the effect of firm-related contingency factors on the nexus between green performance and firm performance. More specifically, it demonstrates that firm-specific boundary conditions of firm innovativeness and customer awareness are significant factors in understanding the link between green performance and firm performance. A failure to accrue product–market benefit from an environmental policy may then be due to failings in firm innovativeness and initiatives to establish customer awareness, rather than with any deficiency in environmental performance. For strategic managers, this information is crucial because it sheds new light on how the firm can accrue valuable performance rewards against environmentally focused activities that are no longer optional. We show when and why an environmental policy is a fruitful investment and not a cost. By incorporating two crucial contingency variables, this study has been able to disentangle, to a degree, the mixed findings of earlier studies.

## **2. Literature review**

The large body of research on the relationship between environmental performance and financial performance can be divided broadly into two streams based on the performance measures used (Dixon-Fowler et al., 2013). One stream of research uses *stock-market performance measures* such as abnormal returns, to examine the impact of environmental performance on firm performance (Amato & Amato, 2012; Endrikat, 2016). As firms' environmental activities might be either beneficial or detrimental for the environment, these studies examined the reaction of the stock market to both positive and negative environmental events (Endrikat, 2016). Overall, the results of these studies demonstrated that stock markets react positively to positive environmental events and negatively to adverse environmental events (Endrikat, 2016), which is largely unsurprising because adverse environmental events inherently carry financial and reputational costs. These studies do not tell us enough about the environmental policy and initiatives of these firms as part of their environmental performance, however.

A second stream of literature utilizes *accounting-based performance measures* (Walker & Wan, 2012; Dixon-Fowler et al., 2013). This stream of research uses a wide range of performance variables such as return on assets (ROA) (e.g., Clarkson, Li, Richardson, & Vasvari, 2011; Horváthová, 2012; Walker & Wan, 2012) return on equity (ROE) (e.g., Horváthová, 2012), Tobin's q (e.g., Dowell, Hart, & Yeung, 2000; Delmas, Etzion, & Nairn-Birch, 2013; Jayachandran, Kalaignanam, & Eilert, 2013) and cash flow (Plumlee, Brown, Hayes, & Marshall, 2015). Overall, the results of these studies are mixed, potentially because of the costs involved in environmental policy and achieving environmental performance without a clear financial link to metrics that may operate as a precursor to these classic accounting-based measures. Collectively, these imply that contingencies in the relationship between environmental performance and firm performance as missing among studies to date.

We conducted a thorough literature review and Table 1 summarizes the important and recent studies given that several review articles have already been published on this topic (see, e.g. Horváthová, 2010; Albertini, 2013; Dixon-Fowler et al., 2013; Endrikat, 2016).

### **Insert Table 1 here**

It appears that extant studies examining the link between environmental performance and firm financial performance investigate the impact of the focal variable either on stock market-based performance measures or accounting-based performance measures. No study thus far, to the best of our knowledge, has explored the link between environmental performance and product–market-based performance measures such as market share, despite the fact that market-based performance measures such as market share assist firms in attaining market power leading, to better performance in the long-run.

Product–market performance potentially matters more as an outcome of environmental policy because initiatives around green products and processes are geared towards improving the firm's positioning with market-based stakeholders. For example, earlier studies (e.g., Jacobs, Singhal, & Subramanian, 2010) have shown theoretically how better green performance might positively impact market share.

Considerable pressure flows from market participants onto firms to act in environmentally conscious ways. Competitors will also respond to this pressure, suggesting that the competitive landscape for market share involves how well the firm satisfied customer needs with its products but also the social conscience of customers with their environmental performance. No study so far, however, has empirically investigated the impact of environmental performance on the market share of firms. This is an important omission because market share has an indirect but positive impact on firm financial performance through improvement of competitive position as well as market power (Capon, Farley, & Hoenig, 1990; Behn & Riley Jr, 1999).

Our review of the literature also shows that despite repeated calls from researchers for the incorporation of firm-specific boundary conditions (King & Lenox, 2001; Dixon-Fowler et al., 2013), only a handful of studies have examined how various external contingencies moderate the relationship between these focal variables. But, firm-specific boundary conditions matter because they affirm or distract the alignment between a firm's strategy, policy and its initiatives on which the firm's objectives and performance are based. In essence, while some attempt has been made by earlier studies to explore the impact of external contingency factors on the nexus between green performance and firm performance, the impact of important firm-specific contingencies still remains unexplored. This study seeks to identify and investigate the effects of some other important contingencies, which are identified in the next section.

### **3. Theory and hypotheses**

The hypothesis development for our study is rooted in instrumental stakeholder theory (Jones, 1995; Jones et al., 2018). Instrumental stakeholder theory explains the connection between a firm's *actions* taken with a view to building and maintain relationship with various stakeholders and the performance consequences of those actions (Egels-Zandén & Sandberg, 2010). That is, Instrumental stakeholder theory delineates the relationship between variable X and variable Y wherein variable X is used as an instrument by the firm to attain variable Y (Jones, 1995). In essence, Instrumental stakeholder theory postulates that firms that proactively adopt and implement specific strategies to meet various stakeholders' expectations will consequently be able to attain competitive advantage in the marketplace, thereby positively affecting the financial performance of the firm (Jones et al., 2018). Our reasoning is that the adoption of an instrumental approach to stakeholder management will assist firms in developing strategies for efficient and proper utilization of natural resources, thereby improving green performance, leading to winning a larger market share.

#### ***3.1 Environmental performance and market share***

Firms have *relational obligations* towards various types of internal and external stakeholders (Tang & Tang, 2018; Jones et al., 2018; Laari, Töyli, & Ojala, 2018; Amankwah-Amoah, Danso, & Adomako, 2019). The instrumental approach to stakeholder theory postulates that firms manage these relational obligations in such a way that the firm may benefit financially from discharging these obligations (Jones et al., 2018). While some of these obligations are explicit, others are implicit, and firms must fulfil these obligations so as to avoid conflict with their stakeholders; conflict

that would otherwise adversely impact the firm's social legitimacy and marketplace reputation (Donaldson & Preston, 1995; Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Tashman & Raelin, 2013). Some of these obligations are codified and formal, are based on verifiable information, and are therefore governed by law (Tashman & Raelin, 2013). Examples include government regulations about protection of the natural environment through reduction of pernicious emissions, pollution and effluents. Conversely, other obligations are informal, and are defined as an 'invisible handshakes' or 'arrangements that are not legally binding' such as innovation of eco-friendly products, services and processes (Godley, 2013).

Infringement of explicit firm obligations will have a detrimental effect on firms' reputation and performance because explicit obligations are legally-binding (Jones, 1995; Ruf et al., 2001; Jamali, 2008). By contrast, implicit obligations towards stakeholders lack any legal basis, and therefore may be violated by myopic firms (Ruf et al., 2001). While lacking legal basis, they may carry a social basis that places them strongly in the minds of customers. Driven by opportunism, some firms may, at times, infringe these implicit obligations to maximizing short-term gains (Ruf et al., 2001). Some firms in a given industry, however, may show a propensity not to violate these implicit obligations, however, if the present value of the future benefits of fulfilling these obligations is greater than the loss that will result from violation (Ruf et al., 2001; Jones et al., 2018; Yagi & Managi, 2018).

A firm's approach to explicit obligations will be typically *reactive* and occasionally *proactive* as the firm formulates strategies in keeping with pertinent laws and regulations (Dixon-Fowler et al., 2013). By contrast, a firm may or may not adopt a *proactive* approach as regards to both implicit and explicit obligations depending on contingency factors such as the nature and intensity of competition within the industry and customers' perception (Dixon-Fowler et al., 2013). Under instrumental stakeholder theory then, firms that adopt an instrumental approach to stakeholder management will adopt both a proactive and reactive approach to fulfill explicit and implicit relational obligations towards various stakeholders (Ruf et al., 2001; Jamali, 2008; Tang & Tang, 2018). That is, to fulfill explicit and implicit obligations, such firms will initiate and engage in various pro-environmental activities, leading to the achievement of better environmental performance (Jamali, 2008; Tang & Tang, 2018). The ultimate objective of engaging in such carefully chosen pro-environmental activities is to attain sustainable competitive advantage (Jones et al., 2018).

Adoption of stakeholder-driven eco-initiatives should lead to better product-market-based performance in a multitude of ways (Klassen & McLaughlin, 1996; Baker & Sinkula, 2005; Jacobs et al., 2010; Surroca, Tribó, & Waddock, 2010; Cronin, Smith, Gleim, Ramirez, & Martinez, 2011; Amato & Amato, 2012; Papista & Krystallis, 2013; Walker, Zhang, & Ni, 2019). Engaging in socially responsible activities such as eco-friendly initiatives create a reputation that the firm is honest and reliable, and that customers view the products and services of these firms as more reliable and of better quality (McWilliams & Siegel, 2001; Xie, Zhu, & Wang, 2019; F. Zhang & Zhu, 2019). Moreover, superior environmental performance may be used as a source of product differentiation over competitors' offerings (Boehe & Barin Cruz, 2010; Clarkson et al., 2011; Tashman & Raelin, 2013; Pappas & Tran, 2019; Zhao, Feng, & Shi, 2018). In essence, a firm that fulfills its explicit and implicit obligations towards stakeholders in relation to the natural environment is better able to

differentiate itself from competitors (Hart, 1995; Tashman & Raelin, 2013) and has the basis to outperform market competitors by holding greater social legitimacy in the eyes of increasingly environmentally sensitive customers. Such a differentiated image in the marketplace assists the focal firm in attracting new potential customers, thereby positively affecting its sales performance. Furthermore, it has been documented that customers are willing to pay a higher price for eco-friendly products and services (Chen, 2010; Amato & Amato, 2012) which might positively affect current and future revenue streams (Jacobs et al., 2010), but draw customers back to the firm as well. Its market share should both grow but also become more robust to competitor actions.

Superior environmental performance may also open new revenue-enhancing opportunities by providing access to new market segments. A positive environmental reputation may open new market segments which are particularly sensitive to such issues (Baker & Sinkula, 2005; Jacobs et al., 2010; Liao, 2018; Paparoidamis & Tran, 2019; Du, Zhang, & Feng, 2018). In other words, surpassing customers' expectations with regard to the natural environment through the adoption of a proactive approach to manage its stakeholder obligations (from an environmental perspective) may attract new customers towards the firm's products because environmentally conscious customers are likely to be more enthusiastic about the products of green firms (Klassen & McLaughlin, 1996; Mathur & Mathur, 2000; Jacobs et al., 2010; Cronin et al., 2011; Nyilasy, Gangadharbatla, & Paladino, 2014; Ali, Xiaoling, Ali, Sherwani, & Muneeb, 2019). Pro-green initiatives resonate with consumers and positively impact the brand equity of concerned firms (Klassen & McLaughlin, 1996). In a recent study, Olsen, Slotegraaf, & Chandukala (2014) have demonstrated that the introduction of environmentally friendly products (i.e., green products) has a positive effect on customers' brand attitude, which is one of the crucial dimensions of brand equity. Similarly, Chen (2010) has showed that green brand image is positively related to customer satisfaction and green brand equity. It is well-documented in the brand management literature that firms with higher brand equity outperform competing firms in market-based performance measures such as sales growth and market share (Yeung & Ramasamy, 2008; D. H.-M. Wang, Chen, Yu, & Hsiao, 2015; Vomberg, Homburg, & Bornemann, 2015; H.-M. D. Wang & Sengupta, 2016).

Eighty-seven percent of the adult population in the U.S. has been shown to be environmentally conscious and that these customers are willing to buy green products and services (Lai, Chiu, Yang, & Pai, 2010). Marketplace surveys have also demonstrated that customers view the products and services of firms that engage in pro-environmental activities in a particularly favorable light. One study found that "84% of Americans say they would be likely to switch brands to one associated with a good cause, if price and quality are similar." Another study found that "79% of Americans take corporate citizenship into account when deciding whether to buy a particular company's product, and 36% consider corporate citizenship an important factor when making purchasing decisions (Bhattacharya & Sen, 2010). These marketplace surveys provide support for the fact that an instrumental approach to stakeholder relationship management assists firms in gaining and bolstering trust among the stakeholders. An environmental policy that operates across a series of indicators is necessary to demonstrate sufficient environmental performance that is authentic and legitimate in the eyes of instrumental stakeholders.

While some consumers of green products may be price and quality sensitive (D'Souza, Taghian, & Khosla, 2007), it has been shown that eco-friendly consumers are willing to pay a higher price for a green product that is similar to a regular product (Laroche, Bergeron, & Barbaro-Forleo, 2001). Some studies even report evidence that some consumers are willing to buy green products of lower quality compared to non-green products (D'Souza et al., 2007). In turn, instrumental stakeholder theory leads us to project that firms' able to achieve high environmental performance will exhibit higher relative market share because of the market (or customers) favored impression of the business in terms of meeting formal and informal social and environmental obligations, and doing so is robust even against competition, price and quality.

In view of the foregoing argumentation anchored in instrumental stakeholder theory, it seems reasonable to suggest that the products of firms which are known to be environmentally friendly are likely to be chosen ahead of competitors who do not have a similar reputation. This choice should be evidenced in greater sales leading, in turn, to a larger market share. Therefore, it is hypothesized that:

*H<sub>1</sub>: The greater the environmental (Green) performance of a firm, the greater will be its market share.*

### **3.2 The moderating effect of firm-specific contingencies**

Extant studies on the nexus between environmental performance and firm performance are extremely mixed in their findings (Dixon-Fowler et al., 2013). In view of these mixed findings, scholars have called for the adoption of a contingency approach to disentangle the relationship between environmental (green) performance and financial performance (Clemens, 2006; Albertini, 2013; Dixon-Fowler et al., 2013). Earlier meta-analytical studies have demonstrated that the nexus between green performance and financial performance might be contingent upon firm-related factors, specifically (Dixon-Fowler et al., 2013; Albertini, 2013). It is noteworthy, for example, that prior studies predominantly examined external contingencies as opposed to internal firm specific contingency factors (Russo & Fouts, 1997; Wei, Shen, Zhou, & Li, 2017). The sensitivity of the relationship to internal firm factors is likely due to firm-specific boundary conditions augmenting or diminishing the alignment between the firm's environmental policy and its initiatives on which the firm's green performance is based on and ultimately its firm performance objectives.

Instrumental stakeholder theory provides a theoretical narrative to further understand this anticipated effect. While firms deal with several types of external stakeholders, we argue that the influence of different types of stakeholders on a firm's market share is disproportionate. It can be argued that customers of a firm will have more direct impact on a firm's product market performance (i.e., its market share) as opposed to other stakeholders such as suppliers. Moreover, literature on the link between socially responsible initiatives and firm performance (e.g. Servaes & Tamayo, 2013) has shown that customers' knowledge about a firm's social activities plays an indirect role in determining firm performance. That is, the level of customer awareness impacts the direction and strength of the relationship between socially responsible initiatives and firm performance (Servaes & Tamayo, 2013).

The link between environmental performance and firm performance might also be contingent upon firm-specific factors such as firm size and firms' capabilities (Dixon-Fowler et al., 2013; Albertini, 2013). Relevant literature postulates that all firms do not profit equally from better environmental performance because their ability to appropriate value from this reputational asset rests upon internal capabilities (Rubera & Kirca, 2012; Dixon-Fowler et al., 2013). We argued that innovative firms are more efficient in utilizing natural resources at a lower cost through their ability to process innovate. That is, a firm's level of innovativeness affects a firm's ability to efficiently use and protect natural resources which in turn impact financial performance (Hart, 1995; Rubera & Kirca, 2012). Innovative firm can further build in better product features and elements that augment its green credentials, bolstering the effects previewed in Hypothesis 1. Its processes and products are more likely to better serve stakeholders' perception of environmental obligations and raise its performance accordingly. Indeed, a firm's level of innovativeness has been demonstrated to be one of the most crucial contingency factors such that firm innovativeness impacts firm performance both directly and indirectly (Rubera & Kirca, 2012).

In view of the above, we consider both customer awareness and firm innovativeness as contingency variables to examine whether these two variables play change the relationship between green performance and market share. In the ensuing section, we develop our moderator hypotheses.

### ***3.3 The role of customer awareness***

Firms endeavor to differentiate themselves from their competitors through various strategic and tactical actions such as introduction of eco-friendly product design, green supply chain initiatives, and other socially and environmentally responsible initiatives (Boehe & Barin Cruz, 2010; Olsen et al., 2014). While some green initiatives are aimed at fulfilling explicit relational obligations, others are predominantly for the fulfilment of implicit relational obligations (Jones et al., 2018). Firms across diverse industries are increasingly spending more resources to produce green products and services to attract environmentally conscious customers (Dangelico & Pujari, 2010). For instance, Starbucks announced a goal to have 100% recyclable cups, whereas HP has cut packaging on some products by 97% (Dangelico & Pujari, 2010). Such green initiatives are particularly present in firms that seek to benefit financially from these activities by way of building and bolstering relationship with various stakeholders (Jones et al., 2018). These initiatives matter more when customers are more aware of the firm's efforts in these regards.

Instrumental stakeholder theory posits that the extent to which a firm will reap financial benefit from green activities will depend on the focal firm's *information sharing* capability about its pro-environmental activities with stakeholders (Jones et al., 2018). To achieve differentiation through green initiatives, firms need to disseminate pertinent information to their stakeholders, in particular customers, and advertising and promotions are the main tools used to provide this information (Nyilasy et al., 2014). Without this, those initiatives, while environmentally beneficial, occur in isolation to customers, rendering their effects inert or less effective. Hence, many firms are resorting to environmental marketing and green marketing to inform their customers about these environmental initiatives (Chen, 2010). The ultimate objective of such green marketing is to create competitive

advantage in the marketplace through increased level of customer awareness (Fraj, Martínez, & Matute, 2013; Papista & Krystallis, 2013). In other words, firms use green marketing initiatives as *instruments* for building and maintaining relationship with environmental stakeholders such as customers (Jones et al., 2018).

While firms spend most of their advertisement budget to promote their products and services, some use their advertising to promote their social and environmental activities (Yoon, Kim, & Baek, 2016). Such promulgation of pro-environmental activities through advertising is particularly pronounced among firms that adopt an instrumental approach to stakeholders' relationship management (Jones et al., 2018). For example, many firms opt for environmental advertising to persuade their customers to minimize their general carbon footprint, thereby sending a signal to the marketplace about the completion of their implicit relational obligations (Roberts, 1996; Yoon et al., 2016). Other firms craft their advertising message in such a manner that pro-environmental messages are embedded in their product/service advertisements (Chahal & Sharma, 2006; Yoon et al., 2016; Bhatnagar & McKay-Nesbitt, 2016). Such pro-environmental advertising is not only aimed at raising customer awareness but also aimed at gaining social legitimacy, thereby assisting the focal firm in attaining superior market-based performance (Jones et al., 2018).

The reason for embedding their environmental message in the product advertising is that by enhancing environmental awareness among consumers, they may indirectly lead to heightened purchase intention for green products supplied by these firms (Chan, 2004; Papista & Krystallis, 2013; Taylor, 2015; Bhatnagar & McKay-Nesbitt, 2016). Previous studies have shown that increased environmental awareness can positively affect the purchase intention for green products (e.g., Hartmann & Apaolaza-Ibañez, 2012; Nyilasy et al., 2014). For example, Bhattacharya & Sen (2010) found that customers show a higher buying intention for products and services of firms that carry out socially responsible activities. That is, customers are more attracted to the products of firms that fulfill their relational obligations as regards environmental protection (Jones et al., 2018; Tang & Tang, 2018), commensurate with expectations under instrumental stakeholder theory.

However, this buying intention is dependent upon several factors, and one of the most crucial factors is customers' level of awareness about the firms' activities. This logic drives the choice among some firms to increasingly advertising their pro-environmental initiatives to inform customers, with the ultimate objective of creating a positive image for the firm (Carlson, Grove, & Kangun, 1993; Menguc, Auh, & Ozanne, 2010; Nyilasy et al., 2014; Yoon et al., 2016). Using advertising intensity as a proxy for customers' awareness, Servaes & Tamayo (2013) have demonstrated that a higher level of customer awareness about a firm's socially responsible initiatives positively moderates the relationship between corporate social responsibility activities and firm value as measured by Tobin's q. The more a firm spends for advertising, the greater will be the firm's visibility among its existing and potential customers, and consequently the greater will be the positive impact of pro-environmental initiatives on firm's market-based performance. Thus:

*H<sub>2</sub>: The higher the level of customer awareness, the greater will be the impact of environmental (Green) performance on a firm's market share*

### 3.4 *The role of firm innovativeness*

The literature on firm innovativeness demonstrates that innovative firms can enhance their market position compared to competitors in a multitude of ways (Rubera & Kirca, 2012). For instance, firm innovativeness, as reflected by R&D intensity, lowers costs by providing firms with better access to resources required to produce better quality (or better featured) products and services (Kotabe et al., 2002; Rubera & Kirca, 2012). Firms that use green activities as *instruments* for stakeholder management tend to heighten their innovative activities so as to attain competitiveness by way of offering product and services at a relatively lower price due to cheaper and better access to resources compared to their competitors (Rubera & Kirca, 2012). In other words, firms that adopt an instrumental approach to manage relationships with stakeholders will presumably intensify innovation initiatives so as to create and appropriate more value because customers consider both environmental as well as non-environmental aspects of a product in making purchase decisions (Dixon-Fowler et al., 2013; Jones et al., 2018). Moreover, innovation initiatives will assist firms in gaining access to and better utilizing resources in a relatively more environmentally sensitive (or friendly) way, thereby sending a signal to the marketplace pertaining to the firms' commitment towards the fulfilment of relational obligations (Jones et al., 2018).

In addition to a cost reducing function, firm innovativeness positively affects a firm's ability to design better products with unique and differentiated attributes (Kotabe et al., 2002; Artz, Norman, Hatfield, & Cardinal, 2010). Firms with superior product design attained through greater R&D initiatives gain an advantage over their competitors by differentiating their products (Kotabe et al., 2002). Firms with pro-environmental programs gain more from innovations as they offer *additional* benefits (Jones et al., 2018). Therefore, it appears that firm innovativeness complements the focal firm's environmental strategy in enhancing overall firm performance (Rubera & Kirca, 2012).

Furthermore, innovative firms tend to be better equipped with the essential market sensing capability needed to enable them to find new opportunities in the marketplace and to predict shifts in the market (Penrose, 1959; Rubera & Kirca, 2012). Innovative firms are better able to understand and predict customer behavior and expectations which enable them to design better products in keeping with market expectations (Artz et al., 2010; Rubera & Kirca, 2012), expectations that are increasingly moving from product features towards product merits, which include its environmental properties and characteristics. Furthermore, a better market sensing ability among innovative firms explains their tendency to find new customer segments compared to less innovative firms (Kotabe et al., 2002; Rubera & Kirca, 2012). Concurrently, innovative firms are better able to forecast future changes in the marketplace, reducing the risk of volatility in the future revenue stream (Kotabe et al., 2002; Artz et al., 2010). Thus, firms with an instrumental approach to stakeholder management will augment innovation activities to understand changes in the marketplace with a view to maximizing the benefit from eco-friendly activities (Jamali, 2008; Dixon-Fowler et al., 2013).

Finally, firms that use green initiatives as relational instruments are more likely to pursue innovation strategies to be able to fulfil relational obligations at a lower cost

(Donaldson & Preston, 1995; Rubera & Kirca, 2012; Tashman & Raelin, 2013). Green firms will proactively make endeavor to fulfill the explicit and implicit obligations as regards natural environment, yielding an image advantage (Hart, 1995; Ruf et al., 2001; Tashman & Raelin, 2013). Therefore, green firms that emphasize innovativeness are likely to not only reduce cost through efficient utilization of natural resources but also earn the reputation for being socially responsible (Hart, 1995; Rubera & Kirca, 2012; McWilliams & Siegel, 2001). Customers can more easily identify themselves with such firms as compared to firms with no such initiatives (Olsen et al., 2014). Several studies have shown that doing business in a socially responsible manner has numerous related benefits such as increased trust in the firms by the customers (Olsen et al., 2014).

Based on these arguments, we hypothesize that a higher level of firm innovativeness will accentuate the relationship between green performance and market share. Thus:

*H<sub>3</sub>: The higher the level of firm innovativeness, the greater will be the impact of environmental (Green) performance on market share.*

## **4. Methodology**

### **4.1. Data sources and variable measurement**

To examine the link between environmental performance and market share, this study focused on leading U.S.-based green firms identified in the list of the top green firms in Newsweek's green ranking. Data for the study were gleaned from two databases, namely, Newsweek's ranking of green firms and Compustat, both of which have been utilized by earlier studies and recognized as reliable and robust databases (e.g. Clarkson et al., 2011; Z. Wang & Sarkis, 2013; Lyon & Shimshack, 2015).

*4.1.1. Independent Variable:* Data on environmental performance variable *Green* were collected from Newsweek. Newsweek began ranking U.S.-based firms on their environmental performance in 2009. Numerous articles have used this green performance ranking as a reliable and valid source of firms' environmental performance (e.g. Amato & Amato, 2012; Z. Wang & Sarkis, 2013; Lyon & Shimshack, 2015). The green score of each firm ranges between 1% and 100%, and firms are ranked based on the green score they achieve. See Appendix 1 for a detailed explanation as to how firms' green performance is measured by Newsweek.

*4.1.2. Dependent Variable:* Market share data were obtained from the Compustat database. Following earlier studies (e.g. Rego, Morgan, & Fornell, 2013), market share for each sample firm for each year was operationalized as the percentage of sales revenue as compared to total sales revenue in the firm's industry at a 4-digit SIC level (Rego et al., 2013). Following previous precedent, this study used both the current value of the dependent variable as well as the one-year lagged value (Dixon-Fowler et al., 2013).

*4.1.3. Moderating Variables:* Data for the moderating variables have been gleaned from Compustat. The firm innovativeness construct has been defined and operationalized in multiple ways among earlier studies (Kotabe et al., 2002; Rubera & Kirca, 2012). In general, firm innovativeness is defined as a firm's receptivity and

propensity to explore new ideas as well as the adoption of new processes and practices that lead to reinvention and development of new ways of doing things (Lin, Lee, & Hung, 2006; Rubera & Kirca, 2012). One of the widely used approaches to measuring firm innovativeness is *inputs* such as R&D expenditure and patents (Rubera & Kirca, 2012). Innovativeness inputs may not always turn into increased revenues because R&D expenditures do not always turn into actual products. Nonetheless, scholars argue that money spent on R&D has an impact on profitability (McAlister, Srinivasan, & Kim, 2007; Rubera & Kirca, 2012) because firms that invest more in R&D show greater dynamic efficiency and greater flexibility compared to firms that with fewer investments in R&D (McAlister et al., 2007). The current study followed the traditional approach by operationalizing firm innovativeness as R&D intensity, measured by yearly R&D expenditure divided by yearly sales revenue (Kotabe et al., 2002; Rubera & Kirca, 2012).

Following similar earlier studies (e.g. Servaes & Tamayo, 2013; Rahman, Rodríguez-Serrano, & Lambkin, 2017), advertising intensity was used as proxy for customer awareness. Advertising intensity has been used as a reliable proxy for customer awareness as advertising enhances the visibility of a firm's activities and hence customer awareness (Servaes & Tamayo, 2013; Rahman et al., 2017). A higher level of advertising intensity by a focal firm in a given industry increases the firm's *share of voice* compared to other firms in the industry which consequently positively affect customers' awareness about the firm's messages as regards various activities, including its green initiatives (Eagle, Kitchen, & Rose, 2005; Hansen & Christensen, 2005; Servaes & Tamayo, 2013). Furthermore, higher advertising intensity assists the focal firm in cutting through the message clutter in a given industry. That is, advertising intensity reinforces customers' awareness of the focal firm's socially-responsible initiatives (Servaes & Tamayo, 2013; Rahman et al., 2017). Advertising intensity was operationalized as the ratio of the yearly dollar amount of advertising expenditure to the yearly dollar amount of sales revenue (R. Zhang, Zhu, Yue, & Zhu, 2010; Huang & Wei, 2012; Servaes & Tamayo, 2013).

*4.1.4. Control Variables.* Data for control variables were obtained from Compustat. As firm performance is affected by other activities beyond green performance, a set of firm and industry control variables were introduced, drawn from the firm performance literature. This study included the following control variables: firm size, brand equity, leverage and industry HHI (Herfindahl Hirschman Index). The choice of control variables has been guided by relevant studies (Reynolds & Phillips, 2005; Nath, Nachiappan, & Ramanathan, 2010; Horváthová, 2012; Servaes & Tamayo, 2013). The operationalizations of the control variables are reported in Table 2.

The size of the firm is a variable shown to influence firm performance (Horváthová, 2012). Therefore, we controlled for the effect of firm size. We also controlled for the firm's debt leverage which has been shown to influence financial performance (Horváthová, 2012). Earlier studies have demonstrated that highly leveraged firms generally have a lower level of performance because highly leveraged firms tend to be less efficient (Opler & Titman, 1994; Tallman & Li, 1996). Brand equity has been shown to positively affect firm performance. This study, therefore, controlled for the effect of brand equity, operationalized as the log of intangible assets (Nath et al., 2010). As the intensity of industry competition is also likely to impact firm performance, we controlled for the level of industry competition through the HHI

index (Herfindahl Hirschman Index), which is based on industry sales figures collected using 4-digit SIC codes. Finally, the current study also controlled for firm fixed and year fixed effects. Despite the inclusion of a set of firm-specific variables as control variables, there could be other time-invariant firm-level heterogeneity across the sample of firms, such as managerial capability and firm culture. The inclusion of a firm fixed effect controls for this firm-level heterogeneity. Also, the current study incorporated a year fixed effect to control for year-specific impact on firm performance.

**Insert Table 2 here**

#### **4.2. *Sample size and sample period***

The sampling frame for this study was the green ranking of the top US firms published by Newsweek. The sample for this study covers a panel of 97 firms over the period 2010 to 2015, except for the year 2013 in which Newsweek did not publish a green ranking. Financial firms were excluded due to differences in financial reporting policy between financial and non-financial firms.<sup>1</sup> We also excluded firms that are not consistently present in the green ranking during the analysis period. We also excluded firms for which data for most of our key variables were not available in Compustat.<sup>2</sup> For instance, data on our moderating variables were not available for some firms/years. Combining both Newsweek's green score and Compustat databases left us with a maximum of 497 firm-year observations. We, however, included the firms with missing data in our robustness check section to examine whether our results differ.

#### **4.3. *Model specification and estimation***

We employed the following model specification:

$$\begin{aligned} \text{Marketshare}_{it} = & \alpha + \beta_1 \text{Green}_{it} + \beta_2 \text{Advertising intensity}_{it} + \beta_3 \text{R\&D intensity}_{it} \\ & + \beta_4 \text{Green}_{it} * \text{Adevertising intensity}_{it} + \beta_5 \text{Green}_{it} * \text{R\&D intensity}_{it} \\ & + \text{Year dummies} + \text{Firm dummies} + \varepsilon_{it} \end{aligned}$$

Where *the i* and *t* index represent firm and year, respectively;  $\varepsilon_{it}$  is the disturbance term containing unobserved firm-specific effects, and the idiosyncratic component of the error term. Following earlier studies (e.g. Servaes & Tamayo, 2013; Luo & Du, 2015), we lagged the green performance variable by one period.

Previous studies have predominantly used an ordinary least squares (OLS) estimator (e.g., Servaes & Tamayo, 2013). However, estimating panel data with OLS may result in biased estimates because of unobserved heterogeneity (George, 2005). While the

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<sup>1</sup> Financial firms (sic codes 6000 to 6999) significantly differ from nonfinancial firms in terms of their operating decisions, and the nature of accruals.

<sup>2</sup> Company identifiers including ticker symbols, cusip, sedol, etc., are not available in the Newsweek green ranking. Therefore, we first manually matched ticker symbols for all firms, which were then used to collect financial information on the sample firms.

standard random effect or fixed effects model can capture these relationships, these models do not account for autocorrelation, heteroskedasticity and cross-sectional dependence in the dataset (George, 2005). Hence, we used the feasible generalized least square (FGLS) estimation technique because it provides reliable estimates in the presence of heteroskedasticity, autocorrelation and cross-sectional dependence, which are likely to be present in a panel dataset such as ours (George, 2005).

To examine whether the results of this study are methodological artifacts, we carried out several robustness tests including the use of alternative estimation methods. These are reported in the subsequent section. In our robustness analysis, we also used a System Generalized Method of Moments (System GMM) estimator designed by Arellano & Bover (1995) and Blundell & Bond (1998). Such panels may expose to potential fixed effects and, apart from those fixed effects, idiosyncratic errors that are heteroskedastic and correlated within but not across individual firms (Luo, 2015). The system GMM estimation method accounts for both dynamic endogeneity and unobserved heterogeneity in panel data models and provides less biased coefficients with finite sample-corrected standard errors.

## **5. Empirical analysis and discussion**

### **5.1. Descriptive statistics**

Descriptive statistics and the correlation matrix for the initial sample are presented, respectively, in Panels A and B of Table 3.

**Insert Table 3 here**

### **5.2. Main findings**

The results of the study are reported in Table 4. Results in Table 4 show that the main variable of interest, *Green performance*, yields a positive coefficient with varying levels of statistical significance in all the three models and supports Hypothesis 1. Regarding the economic impact, a one standard deviation increase in green performance results in a 0.08 percentage points increase in market share performance that translates into an increase of approximately 2.6% in the market share of firms from the sample average of 29% in their respective industry.<sup>3</sup> Moreover, the coefficient of the *Green performance* variable not only maintains its significance across the three models, but its magnitude also improves when we control for various firm and industry features. Therefore, we conclude that the higher the green performance, the greater is the impact on market share. That is, firms with better environmental (green) performance increase their market share by attracting more customers towards their products and services.

Hypothesis 2 stipulates that the relationship between environmental performance (*Green*) and market share will be positively moderated by customers' awareness about the firms' green initiatives. The findings of this study also support Hypothesis 2; the moderating variable of customer awareness (*Green performance X Advertising intensity*) is positive and statistically significant at varying levels of significance

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<sup>3</sup> Using coefficient of Green performance in baseline regression of Table 4 and average value of Green we get,  $0.0151 * 0.505 = 0.0076$  or 0.08% increase, which means  $0.0076 / 0.29 = 0.026$  or 2.6% increase in market share from sample average of 29%.

across the three regression models reported in Table 4. This result underlines the importance of informing customers about the firm's green initiatives, because the more aware customers are, the greater the positive impact of environmental performance on market share.

Our findings also support Hypothesis 3 concerning the positive moderating role of firm innovativeness (*Green performance X R&D intensity*). Results reported in Table 4 show that the level of firm innovativeness accentuates the relationship between green performance and market share and the result is positive and statistically significant mainly at 1% (Model 2 & 3) and 5% (Model 1) levels. This finding highlights the importance of a firm's focus on innovation because an innovative firm can produce better quality products with better green features which attract more customers. Hypothesis 3 is therefore supported.

**Insert Table 4 here**

### **5.3. Robustness checks and additional analysis**

We carried out several additional analyses to examine whether the findings of our main analysis are robust.

#### **5.3.1. Endogeneity<sup>4</sup>**

It might be argued that firms with larger market share will have greater financial resources and could invest more in green initiatives, thereby leading to superior environmental performance. In other words, market share may potentially cause firms to perform better in terms of green performance, leading to reverse causality. Therefore, the first robustness check is to account for a possible endogeneity bias that may stem from reverse causality. To address this concern, we used system GMM estimators designed by Arellano & Bover (1995) and Blundell & Bond (1998) described in the method section. The results reported in Panel A of Table 5 demonstrate that our main findings still hold after accounting for this possible endogeneity.

**Insert Table 5 here**

#### **5.3.2. Treatment of missing values and inclusion of additional control variables**

In our main analysis, we excluded observations with missing data for advertising and R&D expenditure. In the second test for the robustness of our findings, and in keeping

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<sup>4</sup> In unreported results, we re-estimated the model using fixed effects and 2-stage least square (2SLS) regression with an instrument variable based on the color of the U.S states in which the sample firms are headquartered (Cahan, Chen, Chen, & Nguyen, 2015). Depending on the ideological leaning, the states in the USA are divided into blue (Democratic) or red (Republican). It has been shown that firms with head offices in Democratic-leaning states tend to be more socially responsible, compared to firms with head offices in Republican-leaning states (Di Giuli & Kostovetsky, 2014). Data were collected from [www.electoral-vote.com](http://www.electoral-vote.com). This variable was used as a dummy variable equaling 1 for a Blue State and 0 for a Red State. Our results with the two alternative estimation techniques remain consistent with the main results, thereby providing support for the robustness of our findings. These results are available on request from the authors.

with similar prior studies (e.g., Servaes & Tamayo, 2013), we replaced the missing values of advertising and R&D expenditure with zero and re-estimated the model (M1). The results reported in Panel B of Table 5 show that our main findings remain qualitatively unchanged. As an additional test for robustness regarding control variables, we followed earlier studies (e.g., Servaes & Tamayo, 2013) and incorporated three additional control variables, namely, *Capital expenditure*, *Selling intensity* and *Efficiency* (the definitions for these variables can be found in the table footnotes). Findings reported in M2 of Panel B in Table 5 demonstrate that the new results are in line with the main findings of the study.

### **5.3.3. Industry effects and alternate measures of financial and environmental performance**

As an additional test for robustness, we controlled for industry effects, and we also used two alternative measures of firm performance (see Panel C Table 5). These two alternative performance measures are firm value, operationalized as the *Log of market value* (M1), and return on assets (*ROA*) (M2), operationalized as net income divided by average total assets. Notably, firm value is a stock market-based performance measure, whereas ROA is an accounting-based performance measure, both of which dominate prior studies. We selected these two additional performance measures to attain comparability with those findings of prior studies. Finally, we carried out an additional robustness check with an alternative measure of firm green performance. To calculate the alternative measure of green performance, data were collected from the Thomson Reuters ESG database. This alternative measure of environmental performance consists of the following three dimensions: utilization of natural resources, emission and environmental innovation (see appendix 2). The results of these additional analyses corroborate our main findings after controlling for industry effects. Also, our results remain robust to the alternative measures of environmental performance.

## **6. Discussion**

The nexus between corporate environmental ('green') policy and its green performance and firm financial performance is widely studied, but with mixed findings. Using instrumental stakeholder theory, we argued that two absent explanations might explain these findings and lead to new insight and a better understanding of when and why the green performance of a firm's environmental policy may reward firm performance. First, extant studies have narrowly treated firm performance solely in stock market or accounting-based terms, missing product-market performance as a critical dimension of firm performance. This oversight matters because while a preponderance of studies show that environmental performance matters for stock price returns (typically treated as reactions to positive and negative environmental events by the firm) (e.g., Amato, 2012; Endrikat, 2016), its return on assets and contribution to profitability are mixed (e.g., Clarkson, 2011; Horváthová, 2012; Plumlee, 2015; Walker, 2012). Under instrumental stakeholder theory, the firm performance consequences of performance against an environmental policy depend on the stakeholder in question and their interpretation of the extent to which the firm meets its explicit and implicit environmental and social obligations. Against this backdrop, the customer is a crucial (and somewhat overlooked)

stakeholder with a direct bearing on the product–market performance as measured by market share. Environmental, green issues matter increasingly to customers and in making purchase decisions, green performance can directly shape their interaction with the firm and their choices towards buying its products and services.

For our first contribution then, we provide a theoretical narrative grounded in instrumental stakeholder theory that predicts how and why firms that use environmental activities as *instruments* for managing relationships with stakeholders benefit from their green performance in terms of market share, an important product–market-based performance variable omitted from earlier studies. In addition, we extend this contribution by providing the first set of empirical evidence that validates this theory and prediction. The results of this study show that the firms that invest in positive green initiatives reap the benefits in the form of better market share. In doing so, this study provides robust empirical evidence regarding the impact of environmental performance on market share, which was theorized without empirical proof by earlier studies (e.g., Jacobs et al., 2010). The results also demonstrate that green performance has a positive impact both in the concurrent year and in the year after, extending theory to show that effects last much longer than extant theory currently anticipates. This finding, therefore, extends those of prior studies by providing robust empirical evidence on an essential dimension of firm performance and a theoretical narrative to understand effects for firm performance from its environmental performance. We deviate from earlier studies precisely by studying the impact of environmental performance on product–market-based performance as opposed to stock market- and accounting-based performance, which dominate prior studies. Nevertheless, our theory is also robust and corroborate the findings of earlier studies that report a positive relationship between environmental performance and firm performance measured by stock market and accounting-based performance (e.g., King & Lenox, 2001; Clarkson et al., 2011; Jo, Kim, & Park, 2015; Wei et al., 2017), but in doing so, we add a new theoretical narrative to these findings.

Second, a further potential explanation for mixed findings reported among prior studies is the focus of extant studies on the direct and immediate impact of environmental performance on financial performance to the exclusion of firm-specific boundary conditions. Firm-specific boundary conditions matter because they augment or frustrate the alignment between the firm’s environmental policy and its initiatives on which the firm’s green performance is based and ultimately its firm performance objectives. Our study extends earlier research in that this study explored the impact of two crucial firm-specific boundary conditions, namely, customer awareness and firm innovativeness. The results of the study show that the relationship between green performance and market share is positively moderated by customers’ level of awareness about a firm’s environmental performance and the firm’s level of innovativeness.

For our second contribution then, we provide theory grounded in instrumental stakeholder theory and an accompanying first set empirical evidence of the effect of customer awareness and firm innovativeness as firm-specific contingency factors on the nexus between green performance and firm performance. More specifically, it demonstrates that firm-specific boundary conditions of firm innovativeness and customer awareness strengthen the link between green performance and firm performance. A failure to accrue anticipated or hoped for product-market benefits

from an environmental policy may then be due to failings in firm innovativeness and initiatives to establish customer awareness, rather than with any deficiency in its environmental performance. These new insights shed new light on how the firm can accrue valuable performance rewards from environmentally focused activities that are no longer optional. As part of our second contribution, then, grounded in institutional stakeholder theory, we provide a theoretical narrative that explains when and why an environmental policy is a fruitful investment and not a cost. By incorporating two new contingency variables, our theory can disentangle, to a degree, the mixed findings of earlier studies.

Our second contribution addresses long-standing calls for an examination of how boundary conditions affect the link between green performance and firm performance (Horváthová, 2010; Dixon-Fowler et al., 2013). Firm-specific contingencies have correctly been identified as a possible solution to disentangling the mixed findings of earlier studies (Albertini, 2013; King & Lenox, 2001). The findings of this research demonstrate that the more customers are aware of a firm's environmental initiatives, the greater is the impact on market share. This finding has demonstrated that firms can accentuate the positive link between green performance and market share by informing customers about their eco-friendly initiatives. Firms can augment the benefit of such pro-environmental initiatives through the enhancement of customer awareness. As customers become aware of companies' environmental initiatives, they tend to choose their products and services in preference to alternatives, positively affecting market share. Furthermore, the results of this research shed light on how firms' innovativeness affects the relationship between environmental performance and market share. The findings show that innovative firms reap more benefits in the form of improved market share from their pro-environmental activities. More innovative firms are in a better position to invent and market products and services with superior quality and design which attract more customers.

### **6.1 Managerial implications**

The findings of this study offer several managerial implications. Managers want to know the tangible impact of better environmental (Green) performance on their firm's financial performance because this requires an investment of limited strategic resources. It stands to reason that managers have to be prudent as to how they prioritize the allocation of their resources to attain short term and long-term objectives. The findings of this study suggest that managers should actively engage in pro-environmental activities as it can assist them in winning market share if they publicize it proactively.

Furthermore, managers are aware of the fact that performance hinges upon how strategies of various departments of the firm are formulated, integrated as well as executed. Therefore, managers want to know how the success or failure of decisions and actions taken by one division depend on the actions taken by other division of the same firm. The need for active coordination between operational divisions, which probably have responsibility for green initiatives and the marketing personnel who communicate with customers and other stakeholders is an essential point that has been highlighted by these findings. From a strategy perspective, operational departments, specifically department mainly responsible for green activities, R&D department and marketing department, should work in tandem to reap the utmost benefits from pro-

environmental initiatives. That is, strategic coordination is a sine qua non for reaping the maximum reward of green activities of a firm.

The findings of this study highlight the value that can be gained by informing stakeholders about the green initiatives undertaken by the firm. Firms that publicize their eco-initiatives through advertisements reap more benefits because this method generates the most awareness. That is, firms should adopt a pro-active advertising strategy to enhance firm visibility among other competing firms. Such a strategy, in turn, will heighten customers' awareness about the firm's socially responsible activities including pro-environmental programs carried out by the firm. Moreover, our results suggest that managers should also focus on the firm's innovative strategy because a pro-active innovation strategy assists firms in gaining more from better environmental performance. That is, while customers prefer to buy products and services from firms with better environmental performance, customers also take the level of innovativeness of a product/service into their buying decision.

## **6.2 Limitations and future direction for research**

As with any research, the current research has some limitations. The present research drew its sample from US-based firms. Therefore, the findings of this study might not be generalizable to firms based in other countries whose context is markedly different. While firms based in other different countries do not encounter identical environmental constraints, the pressure on firms to adopt environmental policies and generate such initiatives is a global one, as is the pressure on strategic managers to achieve returns on their activities. Future studies should draw samples from multiple countries to explore if any country-specific factors impact the nexus between environmental performance and financial performance. Second, our sample of firms for this study consists of large corporations. Hence, the results of this study may not be generalizable to smaller firms. More research is needed to examine whether not different types of firms benefit financially from engaging in pro-environmental initiatives and do so under the same boundary conditions. Also, future studies should examine whether there may be any curvilinear relationship between environmental performance and various measures of firm performance. Such investigation will help further our understanding of the mixed findings reported among extant studies when studying the effects of environmental performance on stock market-based and accounting-based performance metrics. Finally, more fine-grained analyses can help generate new insight into the benefits of specific types of environmental initiatives (e.g., the Newsweek measure of environmental performance has eight specific indicators) and whether certain initiatives are more beneficial for firms than others.

## **7. Conclusion**

This paper fills a gap in the environmental performance literature, and demonstrates the positive impact of green performance on the market share. While several earlier studies explored the link between environmental performance and financial performance, all earlier studies predominantly used either a stock market-based performance such as stock return or an accounting-based performance measures such as return on assets. This study deviates from earlier studies in that this study explored the nexus between environmental performance and an important product-market-

based performance measures, namely, market share. Hence, this study complements the findings of earlier studies in a significant manner.

More specifically, this study adds to the extant literature in two distinct ways. Firstly, from a theoretical perspective, this study demonstrates how the instrumental theory of stakeholder management helps to better understand the theoretical reasoning of the impact of environmental performance on market share. The study postulated that when firms adopt an instrumental approach to stakeholder management and fulfill the explicit and implicit relational obligations with the stakeholders about the protection of the natural environment, they reap the benefits by winning a larger market share. Secondly, the study has been able to disentangle the mixed findings of earlier studies, to an extent, by incorporating two crucial firm-specific moderators, namely customer awareness and firm innovativeness. Our findings bear out the arguments in earlier literature for the value of a contingency (Dixon-Fowler et al., 2013; Albertini, 2013). This research, therefore, makes important contributions by demonstrating the significant impact of two contingency variables—customer awareness and firm innovativeness – on the core relationship between green initiatives and market share. Our findings demonstrate that firms that engage in eco-friendly initiatives due to the adoption of an instrumental approach for managing relationships with stakeholders and disseminate their pro-environmental initiatives to stakeholders gain more in terms of market share from their environmental performance. Furthermore, firms tend to intensify their innovation activities to optimize the benefits from its green performance.

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**Table 1: Review of earlier studies**

Authors	Sample period and country	Sample size	Performance variable	Moderators/mediators	Impact on performance
Wei, Shen, Zhou, & Li (2017)	Survey, China	2838 firms	ROA, ROS, Profit margin, profit growth	Political and business legitimacy	Positive (indirect)
Ramanathan (2016)	2010, UK	134 Firms	Growth	Environmental performance	Curvilinear
Jo, Kim, & Park (2015)	2002-2011, Multi-country	4924 firm/year	Return on assets (ROA)	No	Positive
Delmas, et al. (2013)	2004-2007, USA	475 firms	Tobin's q	No	Mixed
Clarkson, et al. (2011)	1990-2003,	242 firms	Return on assets (ROA) and	No	Positive

	USA		Cash flow		
Earnhart & Lizal (2007)	1996-1998, Czech Republic	1063 Firm/year	ROA, ROE, ROS	No	Neutral
Clemens (2006)	Survey, USA	76 Firms	Profitability, earnings, revenue	Green incentives	Positive
Elsayed & Paton (2005)	1994-2000, UK	227 firms	Return on assets, return on sales and Tobin's q	No	Mixed/negative
King & Lenox (2001)	1987-1996, USA	652 firms	Tobin's q	No	Positive
Russo & Fouts (1997)	1991-1992, USA	243 firms	Return on assets (ROA)	Industry-growth	Positive

**Table 2. Variables for the study**

Types of variables	Variable	Operationalization	Data Source	Literature
Dependent variable	Market share	Percentage of sales revenue as compared to total sales revenue in an industry at 4-digit SIC level	Compustat	Rego, et al. (2013)
Independent variable	Green (environmental performance)	Green score	Newsweek	Amato & Amato (2012); Lyon & Shimshack (2015)
Moderating variable	Customer awareness	Advertising expenditure divided by sales	Compustat	Servaes & Tamayo (2013)
	Firm innovativeness	R&D expenditure divided by sales	Compustat	McAlister, et al. (2007); Rubera & Kirca (2012)
Control Variables	Leverage	Total liabilities over total assets	Compustat	Azeez (2015)
	Brand equity	Log of intangible assets	Compustat	Nath, et al. (2010)
	Firm size	Log of total assets	Compustat	Servaes & Tamayo (2013)
	Industry competition	HHI index (Sales based Herfindahl Index using 4-digit Sic codes)	Compustat	Servaes & Tamayo (2013)

**Table 3. Descriptive statistics and correlation matrix**

Panel A. Descriptive statistics						
<i>Variable</i>	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>St.Dev</i>	<i>Min</i>	<i>Max</i>
<i>Green performance</i>	468	0.53	0.54	0.20	0.00	0.99
<i>Market Share</i>	468	0.32	0.23	0.27	0.01	1.00
<i>Advertising intensity</i>	468	0.03	0.02	0.04	0.00	0.27
<i>R&amp;D intensity</i>	468	0.05	0.02	0.07	0.00	0.30
<i>Brand value</i>	456	7.88	8.18	1.89	1.06	11.53
<i>Leverage</i>	468	0.25	0.23	0.17	0.00	0.88
<i>Total assets</i>	468	34126.26	14406.50	47256.86	2293.10	290479.00
<i>Industry HHI</i>	468	0.29	0.20	0.24	0.00	1.00

Panel B. Correlation Matrix							
<i>Variables</i>	<i>Market Share</i>	<i>Green performance</i>	<i>Advertising Intensity</i>	<i>R&amp;D intensity</i>	<i>Leverage</i>	<i>Brand value</i>	<i>Total assets</i>
<i>Green performance</i>	0.062*						
<i>Advertising intensity</i>	0.031	0.029					
<i>R&amp;D intensity</i>	-0.376*	0.191*	-0.037				
<i>Leverage</i>	0.116*	-0.072*	0.042	-0.242*			
<i>Brand value</i>	0.065*	0.066*	0.066	0.225*	0.073*		
<i>Total assets</i>	0.001	0.089*	-0.071	0.014	0.008	0.372*	
<i>Industry HHI</i>	0.823*	0.058*	0.005	-0.273*	0.117*	0.024	-0.059*

\* Denotes significance at 5%

**Table 4: Hypotheses testing results**

	Baseline model (M1)	Controlling for Size, Leverage and Brand value (M2)	Lagged Green score (M3)
<i>Green performance</i>	0.0151*** (0.01)	0.0260*** (0.00)	0.0111** (0.05)
<i>Advertising intensity</i>	0.0266 (0.69)	0.0676 (0.32)	-0.036 (0.58)
<i>R&amp;D intensity</i>	-0.1704*** (0.00)	-0.1661*** (0.01)	-0.2073*** (0.00)
<i>Green performance * Advertising intensity</i>	0.0018** (0.03)	0.0002 (0.82)	0.0025*** (0.01)
<i>Green performance * R&amp;D intensity</i>	0.0009** (0.01)	0.0013** (0.04)	0.0030*** (0.00)
<i>Brand equity</i>		-0.0014 (0.52)	-0.0042*** (0.01)
<i>Leverage</i>		-0.0234** (0.03)	-0.0316*** (0.00)
<i>Firm size</i>		0.0476*** (0.00)	0.0338*** (0.00)
<i>Constant</i>	0.0891*** (0.00)	-0.3287*** (0.00)	-0.1748*** (0.00)
<i>Year dummies</i>	Yes	Yes	Yes
<i>Firm dummies</i>	Yes	Yes	Yes
<i>N. observations</i>	467	455	363
<i>N. Firms</i>	97	95	93
<i>Wald Chi<sup>2</sup></i>	498511.57	221568.95	651848.46

P-values in parentheses \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%

**Table 5: Robustness tests**

<b>Panel A: System GMM estimates for endogeneity analysis</b>	
	System GMM estimates (M1)
<i>Lagged Market share</i>	0.9893*** (0.00)
<i>Green performance</i>	0.0077*** (0.00)
<i>Advertising intensity</i>	0.0069 (0.135)
<i>R&amp;D intensity</i>	-0.6310* (0.09)
<i>Green performance * Advertising intensity</i>	0.0011** (0.02)
<i>Green performance * R&amp;D intensity</i>	0.0108* (0.01)
<i>Constant</i>	0.0268 (0.00)
<i>Year dummies</i>	Yes
<i>N. observations</i>	366
<i>N. firms</i>	97
<i>Hansen J-stat p-value</i>	0.161
<i>AR(1) p-value</i>	0.038**
<i>AR(2) p-value</i>	0.275
<i>F-stat</i>	12275.20***

P-values in parentheses \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%

**Panel B: Treatment of firms with missing values and additional control variables**

	Treated missing values of advertising and R&D intensities (M1)	Additional control variables (M2)
<i>Green performance</i>	0.0098*** (0.00)	0.0433*** (0.00)
<i>Advertising intensity</i>	-0.1147* (0.06)	0.1581** (0.04)
<i>R&amp;D intensity</i>	-0.0815** (0.02)	0.082 (0.18)
<i>Green performance * Advertising intensity</i>	0.0001 (0.82)	-0.0005 (0.50)
<i>Green performance * R&amp;D intensity</i>	0.0008* (0.06)	0.0013** (0.02)
<i>Brand equity</i>	0.0006 (0.52)	0.0005 (0.76)
<i>Leverage</i>	-0.0125* (0.07)	-0.0287*** (0.00)
<i>Firm size</i>	0.0529*** (0.00)	0.0461*** (0.00)
<i>Capital expenditure</i>		-0.0677** (0.03)
<i>Selling intensity</i>		-0.1781*** (0.00)
<i>Efficiency</i>		0.0372*** (0.00)
<i>Constant</i>	-0.3787*** (0.00)	-0.3311*** (0.00)
<i>Year dummies</i>	Yes	Yes
<i>Firm dummies</i>	Yes	Yes
<i>N. observations</i>	1170	455
<i>N. Firms</i>	237	95
<i>Wald Chi<sup>2</sup></i>	951408.23	619448.44

P-values in parentheses \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%

*Capital expenditure* is capital expenditure over sales revenue

*Selling intensity* is general, selling, and administrative expense over sales

*Efficiency* is measured as the inverse ratio of operating expense over sales

**Panel C: Industry effects and alternate measures of financial and environmental performance**

Dependent variables:	Alternate measures of firm performance		Alternate measure of Environmental performance
	<i>Log of market value (M1)</i>	<i>ROA (M2)</i>	<i>Market share (M3)</i>
<i>Green performance</i>	0.2136** (0.03)	0.0165*** (0.00)	0.0002** (0.04)
<i>Advertising intensity</i>	6.0533** (0.01)	-0.3327*** (0.00)	0.2031** (0.02)
<i>R&amp;D intensity</i>	-2.7363*** (0.00)	-0.9696*** (0.00)	-0.6002*** (0.00)
<i>Green * Advertising intensity</i>	0.0360** (0.04)	0.0026** (0.02)	0.0036*** (0.00)
<i>Green * R&amp;D intensity</i>	0.0208* (0.06)	0.0005 (0.48)	0.0051*** (0.00)
<i>Control variables</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Year dummies</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Firm dummies</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>Industry dummies</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
<i>N. observation</i>	201	455	455
<i>N. Firms</i>	42	95	95
<i>Wald chi2</i>	25368.9589	9086.6588	317722.7799

P-values in parentheses \*\*\* denotes significance at 1%, \*\* denotes significance at 5%, \* denotes significance at 10%

## Appendices

### **Appendix: 1 Newsweek environmental performance measurement methodology**

Several environment-related factors are taken into consideration to arrive at the final green score. For example, in 2015 companies were scored based on their performance on eight specific indicators and a weightage is assigned to each category. These eight categories were energy productivity (15%), water productivity (15%), greenhouse gas productivity (15%), waste productivity (15%), green revenue score (20%), green pay link (10%), sustainability board committee (5%), and audited environmental metrics (5%). Energy Productivity was measured as the total revenue divided by the total Energy Consumption. Greenhouse gas productivity was calculated as Revenue (\$US) divided by total Greenhouse gas emissions (CO<sub>2</sub>e). Water Productivity was defined as Revenue (\$US) divided by total water use. Waste Productivity was defined as revenue (\$US) divided by total waste generated (metric tonnes) minus waste recycled/reused (metric tonnes). The Green Revenue Score was attained by breaking down a firm's revenue into various segments to determine the percentage of a firm's revenue that is green — i.e., derived from products/services that contribute positively to environmental sustainability and societal health. Green pay link was calculated based on the existence or non-existence of mechanisms that linked senior executive pay to corporate environmental performance (Yes =10 percent. No = 0 percent). Sustainability board committee was measured by the existence or non-existence of a committee at the board of directors level whose mandate is related to the sustainability of the firm, including but not limited to environmental matters (Yes =10 percent. No = 0 percent). Audited environmental metrics was measured based on whether or not the environmental metrics were audited by a third party (Yes =10 percent. No = 0 percent).

**Appendix 2:** Resource utilization dimension reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management. Emission dimension measures a company's commitment and effectiveness towards reducing environmental emission in the production and operational processes. Environmental Innovation dimension reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.