ENVIRONMENTAL PRACTICE ADOPTION IN SMEs: THE EFFECTS OF FIRM PROACTIVENESS AND REGULATORY PRESSURE

Beverly B. Tyler, Visiting Professor of Management
R.B. Pamplin College of Business, Virginia Tech
Blacksburg, VA 24061 USA
beverlyt@vt.edu, ORCID: 0000-0002-1974-0178

**Brooke Lahneman*, Visiting Assistant Professor of Management
Jake Jabs College of Business & Entrepreneurship, Montana State University
P.O. Box 173040, Bozeman, MT 59717-3040 USA
brooke.lahneman@montana.edu, **ORDIC: 0000-0002-6770-2782**

Daniele Cerrato, Professor of Management
Department of Economic and Social Sciences, Università Cattolica del Sacro Cuore
Via Emilia Parmense, 84, 29100 Piacenza, Italy
daniele.cerrato@unicatt.it, ORDIC: 0000-0002-3282-451X

Allan Discua Cruz, Senior Lecturer
Department of Entrepreneurship and Strategy
Lancaster University Management School
Bailrigg, Lancaster LA1 4YX, UK
a.discuacruz@lancaster.ac.uk, ORCID: 0000-0002-0069-3092

Karin Beukel, Assistant Professor
Department of Food and Resource Economics, University of Copenhagen
Rolighedsvej 23, 1958 Frederiksberg C, Denmark
kab@ifro.ku.dk, ORCID: 0000-0001-8498-6820

Nathalie Spielmann, Professor of Marketing
NEOMA Business School
59 rue Pierre Taittinger, 51100 Reims, France
nathalie.spielmann@neoma-bs.fr, ORDIC: 0000-0002-9860-3269

Marco Minciullo, Assistant Professor of Strategy
Department of Economic and Business Management Sciences
Università Cattolica del Sacro Cuore
Largo Agostino Gemelli, 1, 20123 Milan, Italy
marco.minciullo@unicatt.it

*Corresponding author

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Abstract: *We know little about how internal and external factors combine to motivate SMEs to adopt environmental practices. Research suggests more entrepreneurially-oriented SMEs are more likely to implement environmental practices than less entrepreneurially-oriented SMEs. Furthermore, configurational analysis suggests the proactiveness dimension has a greater effect on environmental practice adoption than the other entrepreneurial dimensions when tested jointly in SMEs, but research has not tested the proactiveness-environmental practices link independently. Furthermore, we do not know whether the regulatory context moderates this relationship. In this study we develop theory to hypothesize a positive relationship between SMEs' proactiveness and their adoption of environmental practices, and posit that this relationship is enhanced when SMEs experience higher regulatory pressure. We test and find support for our hypotheses using global wine industry survey data, showing that external regulatory pressure can further motivate proactively-oriented SMEs to adopt environmental practices, providing new directions for research on sustainability in SMEs.*

Keywords: Environmental practices, proactiveness, regulatory pressure, sustainability, SMEs

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Faced with limited resources and dynamic competition, there are diverse reasons why small- and medium-sized enterprises (SMEs) would choose to adopt, or not adopt, environmental practices. By environmental practices, we refer to the procedures and policies that firms implement in their daily operations to address environmental concerns (Aragón-Correa, 1998; González-Benito & González-Benito, 2006). Even considering the interwoven benefits of reduced impact on the natural environment and increased profit margins in the long-term (Mayr, Mitter, & Aichmayr, 2017; Slawinski & Bansal, 2015), short-term implementation costs often present significant barriers to SMEs adopting environmental practices (Johnson & Schaltegger, 2016; Simpson, Taylor, & Barker, 2004). SMEs with a high entrepreneurial orientation (EO) tend to frame sustainability as an opportunity rather than a competitive threat (DiVito & Bohnsack, 2017), which explains why some SMEs adopt environmental practices in the face of

such obstacles. However, even among SMEs with high EO, the variability in the rate of adoption of environmental practices persists. This suggests a need to search for internal and external forces that explain this variability. In particular, we need to examine whether the EO dimensions influence environmental practice adoption in SMEs independently, and the contextual forces on these otherwise internally motivated choices (Fraj-Andrés, Martínez-Salinas, & Matute-Vallejo, 2009).

Importantly, when tested jointly with risk-taking and innovation in configurational analyses, the proactiveness dimension of EO (hereafter called proactiveness) has been shown to affect environmental sustainability decisions, actions, and performance to a larger extent than other EO dimensions (DiVito & Bohnsack, 2017). However, this research was still examining proactiveness as combined with the other EO dimensions. In the EO literature, proactiveness is defined as an *"*opportunity-seeking, forward-looking perspective involving introducing new products or services ahead of the competition and acting in anticipation of future demand to create change and shape the environment*"* (Lumpkin & Dess, 2001, p. 431). Ostensibly, SMEs with greater proactiveness, relative to risk-taking and innovation, are more likely to frame the adoption of environmental practices as strategic opportunities to both increase profits and reduce harm to the natural environment (Jansson, Nilsson, Modig, & Hed Vall, 2017; Schindehutte, Morris, & Kocak, 2008), particularly in the longer-term (Mayr et al., 2017; Slawinski & Bansal, 2015), rather than threats related to short-term implementation costs (DiVito & Bohnsack, 2017). However, no study has focused specifically on the independent effect of proactiveness on environmental practice adoptions in SMEs. Thus, our first research question asks: Does SMEs' proactiveness have a significant positive effect on their environmental practice adoption?

Considering the external environment, prior research has shown that the regulatory context can have a strong direct influence on SMEs' activities regarding sustainability, guiding the adoption of a range of sustainability-related practices firms adopt through coercion (Banerjee, Iyer, & Kashyap, 2003; Bansal & Roth, 2000), but has not yet considered the moderating effect of regulatory pressure. We propose that the regulatory context can be an important boundary condition that will moderate the effect of proactiveness on environmental practice adoption. We posit that strong regulatory pressure can enhance the relationship between SMEs' proactiveness and environmental practice adoption, by requiring them to adopt particular practices and/or stipulating thresholds firms must stay within but giving them discretion in the specific practices they adopt to comply (Jansson et al., 2017), both of which internalize the costs of harmful practices (Hao, Gu, & Wu, 2021; Ulucak, Khan, Baloch, & Li, 2020). Alternatively, when regulatory pressure is low, SMEs will be less likely to adopt environmental practices because they are not required to do so by law. Therefore, our second question asks: Does regulatory pressure enhance the relationship between SMEs' proactiveness and their adoption of environmental practices?

Thus, we develop hypotheses related to the effect of proactiveness on environmental practice adoption in SMEs, and how regulatory pressure moderates this relationship. We test these hypotheses with survey data collected in the wine industries across four countries, the US, Italy, France, and Denmark, to supply generalizable results across diverse regulatory contexts. We find support for our hypotheses.

We contribute to work at the intersection of sustainability, the proactiveness dimension of EO, and regulation in two primary ways. First, we contribute to sustainability theory and practice and EO research on proactiveness by theorizing and confirming empirically that SMEs'

proactiveness is a significant predictor of their adoption of environmental practices. This finding encourages sustainability researchers and practice to place more emphasis on how they might encourage SMEs' proactiveness, which will in turn motivate them to adopt environmental practices. Second, we contribute to sustainability and EO research by revealing the enhancing effect of high environmental regulatory pressure on the relationship between proactiveness and the adoption of environmental practices. This finding highlights the significant influence of regulation, an important external contextual factor, on SMEs' internal motivations toward adopting environmental practices. We theorize and find evidence to suggest that regulatory pressure encourages SMEs to search for innovative ways to incorporate required environmental practices in ways that further boost their competitiveness via operating efficiency and niche positioning. This finding thus encourages research that investigates how regulatory pressure can encourage SMEs to internalize longer-term costs of the degradation to the natural environment.

We first review the literature on proactiveness, sustainability, and regulation to develop our hypotheses. Next, we describe the study design and the results of our analyses. Finally, we discuss our contributions, limitations, and future research opportunities.

PROACTIVENESS: A DIMENSION OF ENTREPRENEURIAL ORIENTATION

Covin and Slevin (1989) developed the most prominent and best researched operationalization of EO (Rauch, Wiklund, Lumpkin & Frese, 2009), characterizing an entrepreneurial strategic posture as one in which there is frequent and extensive technological and product innovation, an aggressive competitive orientation, and a strong risk-taking propensity by top management (Kreiser, Marino, & Weaver, 2002). They theorized that the three dimensions of EO – innovation, proactiveness, and risk-taking – should be aggregated together when conducting entrepreneurial research to create a unidimensional strategic orientation when

considering how EO influences firm performance outcomes in SMEs. Studies have revealed high levels of reliability and validity for this operationalization of EO (for example, Barringer & Bluedorn, 1999; Becherer & Maurer, 1997; Naman & Slevin, 1993), and found strong support for the cross-cultural validity of the Covin and Slevin (1989) EO scale and its relationship with firm performance outcomes (Kreiser et al., 2002).

However, researchers have also raised concerns pertaining to the dimensionality of the measure (Knight, 1997; Lumpkin & Dess, 1996) and called into question the interdependence of the sub-dimensions (Dess, Lumpkin, & McGee, 1999; Lumpkin & Dess, 1996). Proponents of the multi-dimensional approach have found that dimensions of EO can vary independently rather than covary in their relationship to performance outcomes, and suggest that the extent to which an entrepreneurial approach to strategy making is useful frequently depends on the organizational or environmental conditions under which such decisions are made (Lumpkin & Dess, 2001). For example, Hughes and Morgan (2007) examined the independent impact of various dimensions of EO on performance of young high-technology firms at an embryonic stage of development and found innovativeness and proactiveness had a positive influence on business performance, while risk-taking had a negative relationship, and competitive aggressiveness and autonomy held little business performance value at the embryonic stage of firm growth. Likewise, Kraus (2013) found a significant and positive relationship between EO and corporate performance using a unidimensional model of EO, but also that the three sub-dimensions of EO served as more robust predictors for corporate performance with performance due mostly to innovativeness, less to risk-taking, and not at all to proactiveness.

Thus, while empirical tests, literature reviews, and statistical meta-analyses (for example, Rauch, et al., 2009) almost unanimously confirm a positive relationship between EO and firm

growth and performance (Becherer & Maurer, 1997; Lumpkin & Dess, 1996; Wiklund & Shepherd, 2005), some studies have found that a multi-dimensional model of EO explains more variance in the performance outcome measure and that different dimensions of EO have the strongest effect on these outcomes – depending on organizational, industry and environmental characteristics (Hughes & Morgan, 2007; Kraus, 2013).

EO and Sustainable Practice Adoption

EO research has also established a rich understanding of how EO is related to sustainable practice adoption. While this stream of research has found strong support for a direct positive relationship between EO and the adoption of sustainable practices (Courrent, Chassé, & Omri, 2018), it has also considered how this relationship is mediated by 'environmental' sustainable orientations (Roxas, Ashill, & Chadee, 2017) and moderated by stakeholder integration (Amankwah-Amoah, Danso, & Adomako, 2018). It has also considered how EO moderates the relationship between a 'social' sustainability culture and sustainability practices (Marshall, McCarthy, McGrath, & Claudy, 2015), and the environmental resources and environmental sustainability engagement relationship (Roxas, 2021), the positive effect of EO on internal lean practices that affect environmental performance (Chavez et al., 2020), as well as green supply chain practices (Silva, Gomes, Carvalho, & Geraldes, 2021).

Proactiveness Dimension of EO and Sustainable Practice Adoption

The link between the proactiveness dimension of EO and sustainability strategies has only been explored in configurations with other EO dimensions (de Guimarães, Severo, & de Vasconcelos, 2018; DiVito & Bohnsack, 2017; Kreiser & Davis, 2010; Rank & Strenge, 2018; Wiklund & Shepherd, 2005). This research suggests that varying levels of proactiveness, relative to the other EO dimensions, lead to different sustainability strategies and a more or less effective

balance and integration of economic, social, and environmental aspects of decisions (DiVito & Bohnsack, 2017). Thus, further investigation into the impact of proactiveness on the adoption of environmental practices in SMEs is warranted.

ENVIRONMENTAL REGULATORY PRESSURE

Environmental regulations are an external pressure that coerces SMEs to adopt certain environmental practices versus not adopting them or choosing to adopt other practices (Banerjee et al., 2003; Bansal & Roth, 2000). Notably, regulatory pressure applies the same requirements across all firms in an industry, which could include requiring all firms to adopt a similar set of environmental practices and/or to comply with minimum environmental quality thresholds, such as air and water quality (Banerjee et al., 2003; Bansal & Roth, 2000). When regulations stipulate environmental outcomes or quality thresholds, firms are given discretion regarding which practices are adopted to comply (Jansson et al., 2017). Environmental regulations place constraints on all firms who are required to comply, regardless of their 'environmental orientation', which "contributes to an organization-wide shared vision of the central role of green issues pertaining to product, price, distribution, and promotion" (Hojnik, Prokop, & Stajskal, 2020, p. 147; Banerjee, 2003). For SMEs with a low environmental orientation, environmental regulations counteract managers' opportunistic behavior that maximizes their individual firm's private benefit at the expense of the natural environment, by forcing them to internalize those costs (Hao, Gu, & Wu, 2021; Ulucak et al., 2020). Indeed, regulators can impose financial penalties on firms found to be in non-compliance with environmental regulations, which shifts the equation toward longer-term costs of noncompliance outweighing the short-term costs of adopting required practices or reduced profits due to competitive threats, particularly for SMEs without ample resources to buffer such costs (Seroka-Stolka & Fijorek, 2020). Even for those

SMEs with a positive environmental orientation, who might prefer to adopt certain environmental practices over others – perhaps favoring ones that will aid them in better differentiating from competitors – the regulatory context requires they adopt those that will aid them in complying with the law (Kassinis & Vafeas, 2006).

Although SMEs do not have a choice in whether they adopt certain required practices, they may differ in how they implement and integrate the required practices, adopt additional practices that allow them to meet the required environmental quality thresholds in a unique way (Schmitz, Baum, Huett, & Kabst, 2019), or even choose to go above and beyond minimum compliance to adopt a more diverse set of environmental practices (Aragón-Correa & Sharma, 2003; Muñoz & Cohen, 2018; Nakku, Agbola, Miles, & Mahmood, 2020). Explanations for many of the environmental adoption choices SMEs make may be attributed to their proactiveness as discussed below, however, given that environmental regulatory pressure applies to all firms in an industry, we can expect it to enhance the relationships between proactiveness and SMEs adoption of environmental practices.

HYPOTHESIS DEVELOPMENT

We develop theory to explain why and how internal and external factors influence the adoption of environmental practice adoption in SMEs. Sustainability research has shown that SMEs may focus their attention on issues as opportunities or threats, and that such a focus can influence the decision to adopt environmental practices. For example, although SMEs can benefit financially from adopting environmental practices in the longer-term (Mayr et al., 2017; Revell & Blackburn, 2007), when faced with strong competitive pressure SMEs appear to focus their attention on competitive threats associated with higher costs and the limited opportunities to differentiate (Tyler et al., 2020). This focus on threats can further heighten SMEs' risk aversion

(George, Wiklund, & Zahra, 2005), making them less willing to adopt environmental practices (Johnson & Schaltegger, 2016; Triguero, Moreno-Mondéjar, & Davia, 2016). Alternatively, when SMEs focus on sustainability as an opportunity, research suggests that SMEs are likely to create value by generating operational efficiencies in the long term and/or by finding ways to differentiate themselves from competitors (Jarl Borch & Brastad, 2003; Muñoz & Cohen, 2018; Wu & Pagell, 2011). We propose that proactiveness plays a strong role in focusing SMEs' attention on the opportunities rather than the threats associated with their adoption of environmental practices because higher proactiveness is related to being more opportunity seeking and more forward-looking.

First, based on the opportunity-seeking nature of proactiveness (Lumpkin & Dess, 1996), we propose SMEs with higher proactiveness are more likely to adopt diverse and higher quality applications of environmental practices that will help them increase efficiency and lower costs in internal operations and to improve cost and quality with suppliers (Cohen & Winn, 2007). Opportunities to generate operational efficiencies arise from greater attention to areas in the production process where they can eliminate inefficiencies and waste, and product and process innovations that lower production costs (Cassells & Lewis, 2011; Geffen & Rothenberg, 2000; Wu & Pagell, 2011). SMEs can leverage their ability to implement sustainability practices quickly and adopt a wide variety of environmental practices, achieving an advantage over larger competitors in keeping costs low while implementing more environmental practices (Dean, Brown, & Bamford, 1996; Nakku et al., 2020). Additionally, these opportunity-seeking SMEs will be more likely to see opportunities inherent in a diversity of environmental practices to improve supplier relationships. Influential suppliers, such as those that provide a substantial portion of a firm's raw and intermediate goods, control the flow of the materials necessary for a

firm to produce its finished products, and so can exert influence through supply, price, and quality controls (Krause, Pagell, & Curkovic, 2001). For SMEs, often constrained by limited resources and slim profit margins, supply issues can be very costly (Johnson & Schaltegger, 2016; Pullman, Maloni, & Carter, 2009; Tilley, 1999). Proactive SMEs can reduce such costs and power by developing close relationships with their suppliers, working hand in hand to find opportunities to make the supply chain more efficient, and produce higher quality products, relative to competitors (Bos-Brouwers, 2010; Geffen & Rothenberg, 2000). Process improvements with suppliers create an opportunity for suppliers to reduce operational costs, which can be passed on to proactive SMEs through lower prices and higher quality of materials (Golicic & Smith, 2013). Thus, opportunity focused, proactive SMEs are better able to apply sustainability practices to reduce operational costs and improve quality through internal efficiencies and supplier relationships relative to SMEs that are less proactive.

Second, SMEs with higher proactiveness are more likely to be "forward-looking" (Lumpkin & Dess, 2001, p. 431) than SMEs with a lower proactiveness, and thus are more likely to anticipate future market demands and shape market forces through branding and marketing. These proactive, future-oriented SMEs are more likely to anticipate market demands, which motivates them to continuously search for new market niches. This proclivity toward looking to the future permits such SMEs to introduce new products or services ahead of competition, and thus shape market demand rather than react to competitive pressure (Aragón-Correa & Rubio-López, 2007; Revell & Blackburn, 2007; Schindehutte et al., 2008). Research suggests that SMEs with higher future-orientations are more likely to recognize the potential value generating activities associated with sustainability than SMEs with lower future-orientations, and these value generating activities once implemented have been found to have stronger effects on long-

term firm performance than short-term (Mayr et al., 2017; Slawinski & Bansal, 2015). Moreover, proactive, forward-looking SMEs would also be more likely to focus on opportunities related to operational areas in which they could generate niche positioning and differentiate themselves from competitors to attract customers, than SMEs that are less proactive. These opportunities primarily arise from customers' shifting preferences toward sustainably produced goods, and from proactive SMEs' tendency toward niche-positioning strategies. Customers are increasingly demanding companies implement sustainable practices, preferring products made in ways that mitigate risks or avoid harm to the natural environment and provide social benefits (Shepherd, Chartrand, & Fitzsimons, 2015). Such customers may come from different market segments (Laroche, Bergeron, & Barbaro-Forleo, 2001) whose values may be more generally aligned with sustainability practices in firms (Shepherd et al., 2015). In general, as customers become more informed about environmental issues (for example, climate change), their propensity to consume products manufactured using environmentally-friendly methods, as well as friendly to the environment upon use and disposal, increases (Shepherd et al., 2015). To capture market share among these customers, and maintain this market share in the future, forward-looking SMEs with higher proactiveness are likely to recognize opportunities to implement a wide variety of environmental practices in their production processes and product design (Brécard, Hlaimi, Lucas, Perraudeau, & Salladarré, 2009; Revell & Blackburn, 2007). Based on these arguments, we propose:

H1: *Proactiveness is positively related to environmental practice adoption in SMEs.*

The Moderating Role of Environmental Regulatory Pressure

The environmental regulatory context has been found to have a strong influence on SMEs' activities regarding sustainability, by requiring all firms in an industry to comply with

environmental practices and/or environmental quality thresholds (Banerjee et al., 2003; Bansal & Roth, 2000). There is general consensus that environmental regulations influence positive environmental outcomes for companies, however prior work has elicited varying direct effects of regulatory pressure on SMEs' environmental practice adoption. This in part because regulatory pressure varies in strength depending on its context, and thus more effective when examined in combination with factors internal to firms (Hao et al., 2021; Martínez Hernández, Sanchez-Medina, & Diaz-Pichardo, 2020). For instance, firms with high proactiveness tend to place greater emphasis on strategies that mitigate harm to the natural environment such as sustainable innovation that leads to high environmental performance (Hojnik et al., 2021).

All firms in an industry, SMEs and large firms alike, must adopt environmental practices that permit them to comply with environmental regulation, which pushes all firms toward the adoption of identical or at least similar practices (Jansson et al., 2017). Given the ubiquitous pressure, the competitive playing field is leveled to some degree, as firms have less choice in adopting practices that might differentiate them from competitors, particularly SMEs that have more constrained resources (George et al., 2005). SMEs tend to be more sensitive to environmental regulatory pressure than larger firms, as they have less resources to absorb the costs related to compliance (Seroka-Stolka & Fijorek, 2020). Thus, we propose strong regulatory pressure will enhance the effect of proactiveness on environmental practice adoption in SMEs.

First, we theorized that regulatory pressure enhances the positive link between SMEs high on proactiveness and environmental practice adoption by encouraging them to search for unique ways to implement and integrate required environmental practices to lower cost and differentiate (Wu & Pagell, 2011). Although strong regulatory pressure may force all industry competitors to implement specific required environmental practices or comply with quality

thresholds, SMEs with high proactiveness are primed to search for opportunities to enhance their competitiveness (Lumpkin & Dess, 1996). Environmental regulation internalizes costs associated with degradation of the natural environment that unfolds over the longer-term (Ulucak et al., 2020), which can increase the financial burden unevenly on resource limited SMEs (Seroka-Stolka & Fijorek, 2020). However, SMEs predisposed to search for opportunities can be expected to find ways to implement and integrate any practices required for compliance with their other operational or environmental practices in ways that better absorb the internalized costs from regulation (Wu & Pagell, 2011). Known to be opportunity-seeking and forward-looking, SMEs with high proactiveness are primed to search for ways to implement environmental practices required for compliance in ways that generate greater opportunities for them for them to differentiate (DiVito & Bohnsack, 2017). In effect, regulatory pressure should trigger SMEs high in proactiveness to think even more creatively about how to integrate environmental practices required for compliance with their other operational practices in ways that increase operational efficiency and work with suppliers to reduce costs and increase quality (Cohen & Winn, 2007), allowing them to more effectively absorb the internalized costs imposed by regulations and differentiate their products and services.

Second, we propose that regulatory pressure enhances the positive link between SMEs high on proactiveness and environmental practice adoption by motivating SMEs to anticipate future market demands and shape market forces through branding and marketing by adopting unrequired environmental practices (Aragón-Correa & Rubio-López, 2007; Jarl Borch & Brastad, 2003). Strong regulatory pressure can encourage SMEs with high proactiveness to adopt environmental practices that help them exceed minimum regulatory practice or quality thresholds, allowing them to raise customers perceptions of their superior quality relative to

competitors. As opportunity seeking and forward-looking, SMEs with high proactiveness are thus likely to view going above and beyond required compliance thresholds as an opportunity to shape market forces and demand (Lumpkin & Dess, 2001; Schindehutte et al., 2008), particularly relative to peers subject to the same regulatory pressure and internalized environmental costs (Ulucak et al, 2020). For such SMEs, strong regulatory pressure can thus serve as an exogenous motivator to encourage an even more careful search for niche and future-oriented differentiation positioning through marketing and branding (Jansson et al., 2017), particularly as green or sustainable brands, which can support premium pricing (Shepherd et al., 2015). Based on these arguments we propose:

> ***H2****: Regulatory pressure positively moderates the relationship between SMEs' proactiveness and their environmental practice adoption.*

CONTEXT AND METHODS

Context: The Global Wine Industry

We test these hypotheses in the global wine industry, which is an appropriate context in which to investigate our questions for many reasons. Most importantly, the majority of the firms in this industry are SMEs, intermixed with a few larger firms (Spielmann, Cruz, Tyler, & Beukel, 2019; Hamann, Smith, Tashman, & Marshall, 2017; Robinson, 2006). Additionally, the wine industry is an agricultural industry, as firms are dependent on the availability of high-quality grape crops. For these reasons, climate change and other environmental issues are central to firms that grow grapes and produce wine (Charters, Spielmann, & Babin, 2017; Resco et al., 2016). Finally, though firms' practices can be similar within regions, such practices tend to vary across regions due to differences in the natural environment related to the topography and climate of the particular region in which grapes are being grown (Robinson, 2006). Thus, firms

in the wine industry are embedded in the natural environment, making this industry an excellent context within which to consider links between SMEs' proactiveness and their adoption of environmental practices, and the moderating effect of regulatory pressure on this relationship.

Sample and Data Collection

Researchers in four countries – U.S., Italy, Denmark, and France – solicited top managers of firms in the wine industry in their countries to participate in an industry survey. A survey with five sections was employed to collect data: a) firm profile; b) strategy; c) perceived macro and industry environmental pressure; d) environmental management practices; e) demographic information. The survey questions were developed in English, translated into Italian, Danish, and French, and finally back-translated into English from these three languages. As suggested by Brislin (1970), back-translation cannot be the only technique to minimize issues associated with lack of equivalence in multi-country surveys (Chidlow, Plakoiannaki, & Welch, 2014). Thus, we combined back-translation with other techniques, namely a pilot study and the use of independent reviewers; that is, parties other than the translators, who reviewed the translated questionnaire. We used the same survey questionnaire across samples, although the timeline and process of gathering the data differed somewhat in each country based on local circumstances. Nonetheless, the quantitative methods used are consistent with research methods researchers have called for in studies on SMEs (Mullen, Budeva, & Doney, 2009).

Complete data were collected for 286 firms using the survey: 22 from the U.S.; 135 from Italy; 24 from Denmark; 105 from France. To examine if common method bias was an issue (Podsakoff et al., 2003), we conducted a principal component factor analysis, which revealed the presence of five distinct factors with eigenvalue greater than 1.0, rather than a single factor. Our five factors together accounted for 69 percent of the total variance in the dependent variable; the

first (largest) factor did not account for a majority of the variance (27 percent). No general factor was apparent, suggesting common method bias was not a problem.

U.S. sample. The data collection process began first in the U.S. To capture a representative sample of wineries in the U.S., we drew a random sample from the population of wineries located online in four states: California, North Carolina, Oregon, and Virginia. In the US industry associations were unwilling to support the research. Thus, a search for firms was conducted online. Post cards were mailed to a stratified sample of 1,000 firms from these four states informing the recipients they would be contacted via telephone to be asked if they would be willing to participate in the study. Approximately 20 percent of the post cards were returned, suggesting that many of these firms were no longer operating. We hired a team of students to call the contacts for the remaining firms, who identified more firms that no longer existed and also determined that some potential participants were unwilling to participate in our study. At the end of this process, 77 potential firm managers verbally agreed to participate in our survey. We sent the survey to this group, of which 27 completed the survey either online (Qualtrics) or by returning an e-mailed copy of the survey in the mail, leaving us with a response rate of 35 percent of those agreeing to participate. Missing data in five left a U.S. sample of 22.

Italy sample. We began collecting data in Italy second. With a total number of wineries and vineyards in Italy at slightly higher than 92,000, our data collection effort involved working with ten main consortia located in five wine production regions (Emilia Romagna, Lombardia, Sicilia, Toscana, Veneto). This sample obtained from these ten consortia consisted of 800 firms. In the end, we received 246 responses to the online survey (Qualtrics) (response rate = 30.75 percent), however, due to missing values, our final sample was only 135.

Denmark sample. Data collection began next in Denmark where a co-author worked with

the two national wine associations in the country to generate a list of their members. All 70 active wineries in Denmark received an email invitation sent by the associations requesting that they access a link and fill out the questionnaire online (Qualtrics). The co-author followed up via emails and phone calls to managers that had not participated within the first two weeks. In total 51 respondents submitted a questionnaire (response rate = 72 percent); however, only 24 could be used in the study because of missing data, which resulted in a 34 percent sample of all wineries in Denmark.

France sample. Prior experience in data collection for the study and specific knowledge of the management of French wineries led the co-author collecting the data in France to determine that online data collection methods were unlikely to be effective in France. Thus, they hired a market research firm to call the pool of potential participants and conduct telephone interviews to obtain survey data. An online search resulted in a list of 2,723 wineries in the major wine producing areas of France. A stratified random sample of 500 firms were selected, with each wine region's sample proportionate to the number of firms located in that region. All 500 firms were contacted by telephone by the market research firm, 105 agreed to participate in the study, and all of them participated in telephone interviews.

Variables and Measures

Dependent variable. The dependent variable used in testing our two hypotheses was the extent to which SMEs adopted environmental practices. Our measure for *Environmental practices* consisted of 25 Likert scale items, based on responses to the prompt: “For the following practices, please rate the extent to which your company has implemented each” (1 = Not at all; 2 = A little; 3 = Moderately; 4 = Significantly; 5 = Very significantly). We adopted the 25-item scale developed by Tyler and colleagues (2020), based on a factor analysis of 40

items, resulting in six identifiable factors. The coefficient alphas for the six factors and the overall measure are as follows: signaling commitment to protecting natural environment (alpha = 0.93); waste management packaging design (alpha = 0.86); life cycle assessment of products (alpha = 0.80); transportation and fossil fuel efficiency (alpha = 0.80); waste management packaging disposal (alpha = 0.85); restoration and conservation of natural habitats (alpha = 0.85); and environmental practices (alpha = 0.94) (more generally). Detailed information about the individual items in each factor can be found by referencing Tyler et al. (2020).

The *Environmental practices* scale is posited to be a reflective measure. Consistent with Edwards' (2011) summary of reflective measures, the six factors constructed using exploratory factor analysis represent a single dimension where each factor captures the entire construct, the items within factors are positively correlated because they are designed as alternative indicators of the same underlying construct, the factors are intended to represent the construct of interest, and changes in the constructs are expected to cause changes in the measures. We combined the six factors into a single scale to serve as our dependent variable. In addition, we used the original 40-item scale as the dependent variable in a robustness check.

Independent and moderating variables. We used the three items included in the Covin and Slevin (1989) study to measure *Proactiveness* (alpha = 0.73). We tested Hypothesis 1 with the *Proactiveness* variable. We measured three kinds of legal pressures to adopt environmental practices, (a) supra-national laws, (b) national laws, and (c) sub-national laws, using Likert scale items (1 = very little influence to 7 = very strong influence). Due to high item correlations, we summed up the score for these three items to create our composite measure of *Regulatory Pressure* (alpha = 0.92). We tested hypothesis 2 with the interaction term *Proactiveness* x *Regulatory pressure*.

Control variables. To extract variance explained by firms' operating contexts, we included control variables for manager-, firm-, industry-, and country-level factors. We controlled for SME managers' attitude toward environmental issues (*Environmental attitude*), using the last six items of the ten-item scale developed by Cassells and Lewis (2011). These items were placed on a 7-point Likert-type scale and worded as statements intended to capture a manager's concern toward environmental issues, their perception of environmental regulation, the benefits of environmental actions, and their relevance to their firm's strategy (alpha = 0.82). To control for firm attributes, we also included *Firm age*, measured by the number of years since the firm was established, and *Firm size*, measured by the number of employees. Four variables controlled for the industry based on a factor analysis of industry characteristics. Participants were asked the following question: "Please rate the extent to which the following stakeholders influence your company's adoption of environmental sustainability practices" (from 1 = very little influence to 7 = very strong influence). *Competitive pressure* combined their response to (a) competitors and (b) industry associations (alpha = 0.72). *Customer pressure* to adopt environmental practices was based on their combined response to (a) end customers and (b) distributors (alpha = 0.74). *Supplier pressure* to adopt environmental practices consisted of combined responses to three items: (a) equipment manufacturer suppliers, (b) raw materials suppliers, and (c) landowners (alpha = 0.83). We controlled for *Community pressure* to adopt environmental practices, captured by a two-item scale based on respondents' perceptions of pressures from the local community and not-for-profit groups (alpha = 0.62). Country-level factors were controlled using three binary variables - *France, Denmark, United States* – which captured the differences compared to Italy, which served as the baseline in our model. In addition, in our main models, which use *Proactiveness* as the independent variable, we controlled for two dimensions of EO

that are commonly studied in configurations with proactiveness: risk taking and innovativeness. We measured *Risk taking* and *Innovativeness* using the three items for each from Covin and Slevin's (1989) scale, with Cronbach's alpha = 0.89 and Cronbach's alpha = 0.87 respectively.

RESULTS

Table 1 shows the descriptive statistics and correlation for the variables of the study. Descriptive information about our data reveals that for our sample the average adoption of environmental practices was relatively high with a mean of 72.124 and a range of 26 (minimum) to 122 (maximum). The mean for entrepreneurial orientation was 42.889, ranging from 11 to 76, and the mean for proactiveness was 11.601 with a range of 3 to 21. Table 1 does not show particularly high correlations, suggesting that multicollinearity does not bias our results. As a post-regression test, we also examined the variance inflation factors (VIFs). In our regression model with the largest number of explanator variables the average VIF is 1.57 (max VIF=2.38), which is below the generally employed cut-off of 10 (or, more cautiously, 5), thus confirming that multicollinearity was not an issue.

[*Insert Tables 1 and 2 about here*]

We test our hypotheses using OLS regression as the estimation method and report our results in Table 2. All models reported *Environmental practices*, calculated using 25 items, as the dependent variable. Heteroskedasticity was not an issue either, since the Breusch-Pagan/Cook-Weisberg test was not significant, indicating the null hypothesis of homoskedasticity could not be rejected. In Model 1 only the control and moderating variables are included. Model 2 tests Hypothesis 1, by incorporating the direct effect of *Proactiveness* on SMEs' adoption of environmental practices, while also controlling for the effects of *Risk-taking* and *Innovativeness*. Models 3 displays the full model with the interaction term *Proactiveness* x *Regulatory pressure*

to test Hypothesis 2, the moderating effect of regulatory pressure on the relationship between proactiveness and the adoption of environmental practices in SMEs. To avoid the problem of multicollinearity, these variables were mean centered, both as stand-alone ones, and as components of the interactions (Aiken, West, & Reno,1991).

We first note the impact of the control variables. SME managers' attitude toward environmental issues (*Environmental attitude*) is positively associated with the adoption of environmental practices as expected based on prior research (Models 2-3, $p<.01$). Regarding firm-level characteristics, *firm age* and *size* do not have a statistically significant effect. Many industry pressures also encourage SMEs to adopt environmental practices: *Customer pressure* (Models 2-3, $p<.01$), *Supplier pressure* (Models 2-3, $p<.05$), and *Community pressure* (Models 2-3, $p<.05$) are positively associated with the adoption of environmental practices. On the contrary, *Competitor pressure* is negatively related to the adoption of environmental practices (Models 2-3, $p<.01$). Country-level factors also significantly affect the adoption of environmental practices: "Old World" firms (France and Italy) are more likely to adopt environmental practices than are firms in the "New World" (Denmark and the U.S.). Indeed, the coefficient is negative and significant for *Denmark* and *U.S.*, revealing that SMEs in these countries adopt environmental practices at a lower extent ($p<.01$), relative to Italy (our reference group), while no statistically significant difference is associated with *France*, relative to *Italy*.

Our first hypothesis suggests that SMEs' proactiveness will be significantly related to their adoption of environmental practices. Hypothesis 1 receives support: *Proactiveness* is positive and significant in Model 3 ($p<.05$). It is also worth noting that *Risk-taking* and *Innovativeness* are not significantly related to the adoption of environmental practices in SMEs. In terms of the moderating effect of regulatory pressure, Hypothesis 2 predicts that the effect of

SMEs' proactiveness on environmental practices adoption becomes stronger as regulatory pressure increases. The positive and statistically significant coefficients of the interaction terms *Proactiveness* x *Regulatory pressure* (Model 3, $p<.05$) indicate that regulatory pressure positively moderates the relationship between SMEs' proactiveness and environmental practice adoption, lending support to Hypothesis 2. We graph the interaction term from Model 3 in Figure 1, which provides a visual confirmation of our prediction that the effect of SMEs' proactiveness on their adoption of environmental practices is stronger for higher levels of regulatory pressure.

[*Insert Figure 1 about here*]

Robustness Analyses

We conducted two additional analyses to assess the robustness of our findings. First, as prior research has focused on EO as a driver of sustainability practice adoption, we tested models in which *Entrepreneurial orientation* is the independent variable, instead of including its three dimensions of proactiveness, risk taking and innovativeness separately. An 11-item scale measured EO, including the 9 items in the Colvin and Slevin's (1989) scale and the 2 items added by Anderson et al. (2015) to the original scale (alpha=0.92). Each of these 11 items were rated along a 7-point Likert scale with the number 4 indicating a neutral position between 1=strongly disagree and 7=strongly agree. This measure has been argued to be more robust than the original measure proposed by Covin and Slevin (1989). Models 4 and 5 of Table 2 show the regression results for this robustness check, which are in line with our expectations. We find positive and statistically significant coefficients for *Entrepreneurial orientation* (Model 4, $p<.05$) and *Entrepreneurial orientation* x *Regulatory pressure* (Model 5, $p<.05$). While we see in Table 2 that EO positively affects the adoption of environmental practices in SMEs and regulatory pressure moderates this relationship, Models 2 and 3 reveal that these effects can be primarily

ascribed to proactiveness, rather than to the other two dimensions of EO.

As a robustness check, we also used the composite measure based on all the original 40 items of environmental practices described above as the dependent variable. The results of these analyses were similar to those presented in Table 2, thus showing that our findings are robust to the use of different measures of the dependent variable. Due to space limitations, these analyses are not reported but are available from the authors upon request. In the next section we will offer further interpretation of these findings, as well as discuss the implications of our research.

DISCUSSION AND CONCLUSION

Although the positive link between EO and sustainability is well established, research has only begun to explore how the various dimensions of EO contribute to this relationship, and also does not fully explain the variability in SMEs' adoption of environmental practices. An important external influence on environmental practice adoption in SMEs, regulatory pressure may serve as a boundary condition that moderates the relationship between internally-oriented EO and environmental practice adoption. However, to our knowledge research has yet to examine this. In this study we integrate the literature at the intersection of sustainability, the proactiveness dimension of EO, and regulatory pressure to untangle and enrich our understanding of the significant positive effect of SMEs' proactiveness on their adoption of environmental practices, and how regulatory pressure enhances this relationship, thus showing how internal and external factors combine to motivate SMEs to adopt environmental practices.

Contributions to Theory and Practice

First, we contribute to sustainability and EO theory and practice for SMEs by theorizing and confirming empirically the significant positive relationship between SMEs' proactiveness and their adoption of environmental practices. Prior studies have suggested that the proactiveness

dimension holds explanatory power toward whether and why SMEs engage in sustainability strategies, however such work has only investigated the role of proactiveness in combination with other EO dimensions (de Guimarães et al., 2018; DiVito & Bohnsack, 2017; Kreiser & Davis, 2010; Wiklund & Shepherd, 2005). We theorized that SMEs who are higher in proactiveness are more opportunity-seeking and forward-looking and, thus, are more likely to adopt environmental practices than SMEs with lower proactiveness. We advocate that, because these SMEs are more opportunity-seeking and forward-looking (Lumpkin & Dess, 2001), their managers can better identify and act on a range of opportunities for lowering operational costs and increasing competitive differentiation related to environmental practices, compared to SMEs low in proactiveness. Our findings extend this research by empirically demonstrating that proactiveness is positively related to SMEs' adoption of environmental practices, while the EO dimensions of risk taking and innovativeness are not significantly related to environmental practice adoption. Future research could extend our understanding of how different dimensions of EO differentially affect a variety of sustainable outcomes in different contexts. It could also investigate whether other factors shown to influence SMEs' engagement in sustainability, such as managers' perceptions for their firms' environmental conditions (Kammerlander, Burger, Fust, & Fueglistaller, 2015; Tyler et al., 2020) and firm resources (Pullman et al., 2010; Tilley, 1999), moderate the relationship our study demonstrates between SMEs' proactiveness and their adoption of environmental practices. Thus, our study contributes to theory on the EO and sustainability link in SMEs, showing that an important internal driver of SME's engagement in sustainability is the proactiveness dimension specifically.

Second, we contribute to sustainability and EO research by revealing the enhancing effect of regulatory pressure on the relationship between higher proactiveness and the adoption of

environmental practices, thus showing the important combined effect of internal and external factors on SMEs' engagement in sustainability. We theorized and found support for our contention that strong regulatory pressure serves as an exogenous motivator for SMEs with high proactiveness to adopt more environmental practices. We theorized that regulatory pressure enhances the positive link between SMEs high on proactiveness and environmental practice adoption in two primary ways. By encouraging them to search for unique ways to implement and integrate required environmental practices to lower cost and differentiate (Wu & Pagell, 2011), and to anticipate future market demands and shape market forces through branding and marketing by adopting unrequired environmental practices (Aragón-Correa & Rubio-López, 2007; Jarl Borch & Brastad, 2003; Schindehutte et al., 2008). Thus, we propose that increases in regulatory pressure motivate proactive SMEs to adopt a broader range of environmental practices, beyond what would help them meet the minimum level of regulatory compliance necessary, in order to ensure both lower operational costs and differentiation relative to competitors who are required to adhere to the same environmental quality thresholds. These findings further highlight the significant influence of the regulatory context as an important external influence on SMEs' internal motivations toward adopting environmental practices (Schmitz et al., 2019), demonstrating that the regulatory context can enhance the ability of SMEs to focus on the opportunities related to adopting a broader range of environmental practices. Thus, our study contributes to theory at the intersection of EO, sustainability, and regulatory pressure, showing that SME's engagement in sustainability will be higher given combined effects of internal and external influences rather than one or the other. Future research can build on this study by examining the influence of other external contextual factors that may be important boundary conditions on the relationships between SMEs' proactiveness and the

adoption of environmental practices.

We also contribute to the practice of sustainability by deepening and extending our understanding of when SMEs are likely to engage in sustainability strategies and practices. Research has highlighted the variance in SMEs' engagement in sustainability, showing that SMEs tend to lag behind larger firms in their adoption of environmental practices and thus lose potential for a competitive advantage through a sustainability strategy (Aragón-Correa et al., 2008; Johnson & Schaltegger, 2016; Triguero et al., 2016). Such variance can be due to SMEs' focus on sustainability as a competitive threat due to increased short-term costs of implementation, particularly in the context of a fragmented industry (Tyler et al., 2020). Importantly, we found that SMEs with higher proactiveness are more likely to identify and act on sustainability as an opportunity, rather than a threat, relative to SMEs with lower proactiveness. SMEs can consider how they might increase their proactiveness, to promote engagement in sustainability.

Limitations and Future Research

As with any study ours has limitations, which present opportunities for future research to test the boundary conditions of our findings and extend them further. First, the data collected in our survey was from the wine industry, which is based in agriculture. Future research could test the boundary conditions of our findings to ascertain the generalizability of our insights on the proactiveness dimension of EO, regulatory pressure, and environmental practice adoption to more diverse industry contexts, such as manufacturing or services. Second, the data we collected sampled firms in four countries where wine is produced, however, there are other countries that produce wine. We had to limit the number of countries included in the sample due to the complexity of data collection, including translation and administration of the survey. Future

research could replicate and extend our contributions using data from wine-producing regions in countries not included in this study. Third, challenges were encountered in data collection efforts in the U.S., where associations and managers were much less willing to participate, and in Denmark, where there are few wine-producing firms. These challenges resulted in smaller sample sizes in U.S. and Denmark as compared to France and Italy. However, with these relatively small samples we were able to control for differences in the country samples, and furthermore the coefficient alphas for our scales suggest that the multi-country data collected was internally reliable. Finally, we theorize that proactiveness will focus SMEs' attention on competitive opportunities related to sustainability, specifically as related to lowering costs and differentiation, but we do not measure their attention focus. Future research could directly measure SMEs' focus of attention and further explore the links between SMEs' focus of attention based on opportunity and threat framing, and adoption of environmental practices.

Conclusion

In conclusion, this study integrates sustainability, the proactiveness dimension of EO and regulation research by developing and empirically testing hypotheses on how SMEs' proactiveness is positively associated with their adoption of environmental practices, and how regulatory pressure positively moderates this relationship. While much of the prior research has focused on large firms, we hope this study of SMEs' sustainability strategies encourages future research to further explore the motivations for and outcomes of sustainability in SMEs. In particular, we advocate for future research to build on our study to further enrich our understanding of the important influence of SMEs' proactiveness on their relative focus of attention on opportunities or threats associated with environmental practice adoption, and how regulatory pressure moderates the relationship between proactiveness and environmental practice

adoption. Such research is important because environmental practices continue to offer opportunity seeking and forward-looking SMEs avenues to lower their costs and differentiate themselves from their competition as they seek to compete against larger firms.

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TABLE 1
DESCRIPTIVE STATISTICS AND CORRELATIONS

		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Environmental practices	72.829	20.788	1														
2	Proactiveness	11.601	3.882	0.310*	1													
3	Entrepreneurial orientation	42.889	13.856	0.288*	0.833*	1												
4	Regulatory pressure	13.797	5.533	0.185*	0.069	0.049	1											
5	Environmental attitude	29.913	7.797	0.218*	0.100	0.109	-0.027	1										
6	Firm age	52.164	68.882	0.018	0.009	0.007	0.039	0.012	1									
7	Firm size	10.769	27.474	0.097	0.198*	0.091	-0.041	0.059	0.124*	1								
8	Competitive pressure	5.633	3.057	0.146*	0.160*	0.251*	0.277*	-0.118*	-0.067	-0.028	1							
9	Customer pressure	8.010	3.452	0.382*	0.211*	0.261*	0.283*	0.065	0.022	0.012	0.509*	1						
10	Supplier pressure	7.829	4.363	0.339*	0.182*	0.230*	0.191*	-0.059	-0.130*	-0.024	0.530*	0.506*	1					
11	Community pressure	5.947	3.131	0.299*	0.202*	0.239*	0.349*	-0.009	-0.054	-0.038	0.603*	0.449*	0.534*	1				
12	France	.367	0.483	-0.041	-0.197*	-0.219*	0.220*	-0.141*	0.147*	-0.068	-0.015	-0.101	-0.153*	-0.068	1			
13	Denmark	.084	0.278	-0.255*	0.077	0.126*	-0.137*	0.057	-0.184*	-0.108	-0.067	-0.063	-0.107	-0.112	-0.230*	1		
14	United States	.077	0.267	-0.197*	-0.048	-0.038	-0.187*	0.028	-0.149*	0.067	0.013	-0.123*	-0.055	-0.004	-0.220*	-0-087	1	
15	Risk taking	11.136	4.262	0.207*	0.663*	0.882*	-0.001	0.105	0.007	0.065	0.187*	0.167*	0.124*	0.141*	-0.072	0.174*	0.025	1
16	Innovativeness	11.657	5.049	0.219*	0.524*	0.821*	0.085	0.061	0.015	-0.021	0.304*	0.274*	0.273*	0.248*	-0.233*	0.073	-0.103	0.586*

Notes:
a) $N = 286$
b) * $p<.05$

TABLE 2
DIRECT EFFECT OF PROACTIVENESS ON ENVIRONMENTAL PRACTICES ADOPTION AND MODERATION OF REGULATORY PRESSURE (MODELS 2-3); ROBUSTNESS CHECK USING EO INSTEAD OF PROACTIVENESS (MODELS 4-5)

	Model 1	Model 2	Model 3	Model 4	Model 5
Proactiveness		0.840** (0.372)	0.933**(0.369)		
Proactiveness * Regulatory pressure			0.128** (0.046)		
Entrepreneurial Orientation				0.309*** (0.079)	0.302*** (0.078)
Entrepreneurial orientation * Reg. Pressure					0.026** (0.013)
Regulatory pressure	0.083 (0.210)	0.088 (0.205)	0.110 (0.202)	0.094 (0.205)	0.123 (0.204)
Environmental attitude	0.548*** (0.135)	0.495*** (0.132)	0.473*** (0.131)	0.499*** (0.133)	0.503*** (0.132)
Firm age	-0.014 (0.016)	-0.017 (0.015)	-.018 (0.015)	-0.018 (0.015)	-0.018 (0.015)
Firm size	0.059 (0.038)	.028 (0.038)	.0345 (0.038)	0.044 (0.037)	0.0452 (0.037)
Competitive pressure	-1.111** (0.467)	-1.204** (0.461)	-1.168** (0.456)	-1.308*** (0.458)	-1.309*** (0.455)
Customer pressure	1.444*** (0.380)	1.323*** (0.370)	1.448*** (0.368)	1.320*** (0.372)	1.346*** (0.370)
Supplier pressure	0.851*** (0.313)	0.810*** (0.305)	0.673** (0.305)	0.793** (0.306)	0.730** (0.306)
Community pressure	1.050** (0.449)	.897** (0.438)	0.826* (0.433)	0.922** (0.439)	0.881** (0.437)
France	-1.978 (2.399)	-1.404 (2.467)	-1.539 ((2.437)	-0.574 (2.366)	-0.874 (2.357)
Denmark	-18.776*** (4.004)	-21.447*** (3.993)	-21.373*** (3.944)	-20.792*** (3.937)	-20.806*** (3.914)
United States	-15. 657*** (4.152)	-15.578*** (4.136)	-15.094*** (4.088)	-14.835*** (4.053)	-14.927*** (4.030)
Risk taking		0.531 (0.357)	0.470 (0.353)		
Innovativeness		-0.132 (0.272)	-0.163 (0.268)		
Constant	41.838*** (5.497)	42.212*** (6.211)	44.031***(6.168)	46.516*** (5.491)	46.970*** (5.463)
R^2	0.336	0.381	0.399	0.372	0.381
Adjusted R^2	0.310	0.350	0.366	0.344	0.352
Number of observations	286	286	286	286	286
F	12.65***	11.94***	11.95***	13.47***	12.91***

Notes:
a) Dependent variable is the 25-item scale for environmental practices
b) Standard errors in brackets;
c) * $p<0.1$, ** $p<0.05$, *** $p<0.01$

FIGURE 1
THE MODERATING EFFECT OF REGULATORY PRESSURE ON THE RELATIONSHIP BETWEEN PROACTIVENESS AND ENVIRONMENTAL PRACTICES ADOPTION

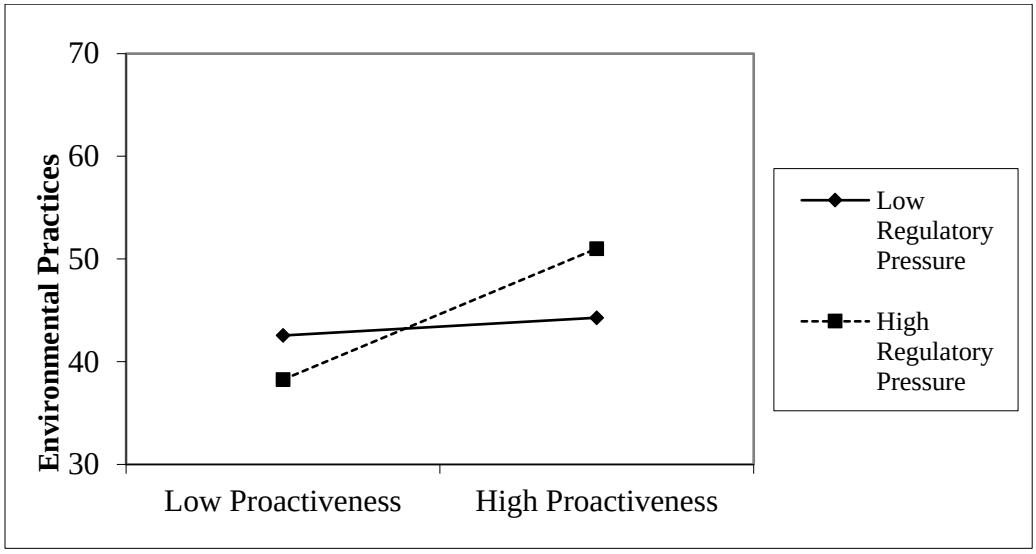

Figure captions:
1: The moderating effect of regulatory pressure on the relationship between proactiveness and environmental practices adoption