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**REGIONS, WINE, AND WOMEN
IN LEADERSHIP: A TEST OF
ENVIRONMENTAL SUSTAINABILITY**

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REGIONS, WINE, AND WOMEN IN LEADERSHIP: A TEST OF ENVIRONMENTAL
SUSTAINABILITY

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REGIONS, WINE, AND WOMEN IN LEADERSHIP: A TEST OF ENVIRONMENTAL SUSTAINABILITY

Abstract: This study examines features of regional clusters and environmental sustainability among member firms. By studying a sample of 646 firms across four regional wine clusters in Australia, the evidence suggests regional export intensity is positively associated with implementation rates of environmentally sustainable practices. Further, as women in leadership roles (as a proxy for social proximity) grow within regional clusters, this strengthens the relationship between export intensity and environmental sustainability. The results advance research on the features of regional clusters that are expected to influence the adoption of organizational practices among member firms. Conclusions are presented along with limitations and future research opportunities.

Keywords: Australia, environmental sustainability, exports, regions, wine

INTRODUCTION

Regional clusters are thought to be at the forefront of economic performance, innovation, advanced learning processes, and even philanthropy (Folta *et al.*, 2006; Galaskiewicz, 1997; Giuliani, 2013; Martin and Sunley, 2003; Poudier and St. John, 1996; Tallman *et al.*, 2004). However, regional clusters are increasingly thought to be at the forefront of environmental sustainability as well (Russo, 2003). Studies have examined the processes of diffusion of environmental responsiveness in regional clusters (Galdeano-Gómez *et al.*, 2008) and whether or not clustered firms demonstrate higher levels of environmental performance than isolated firms (Etzion and McMahon, 2012). Yet, relatively little empirical research has investigated which features of regional clusters lead to a specific emphasis on environmental sustainability. Hence, this paper's main research question: Which features of regional clusters predict environmental sustainability among member firms?

In an effort to advance the literature on regional studies and environmental sustainability, this study makes three contributions. First, the demonstration of environmental sustainability requires a set of processes and practices that enable firms to reduce environmental impacts (Delmas and Toffel, 2008). This paper incorporates firms from four regional clusters to study environmental sustainability. To do that, geographic cluster and institutional theories serve as a basis for hypotheses development. For example, proximity among firms in a cluster amplifies isomorphic processes such that they adapt to prevailing norms and practices (DiMaggio and Powell, 1983; Porter, 1998). In the case of the present study, an argument is put forth that regional cluster export intensity creates an isomorphism such that environmentally sustainable practices are diffused among firms. Some studies have looked at environmental sustainability within regional clusters, yet largely with features in the *local* (e.g. local institutions) geographical context (e.g. Grimstad and Burgess, 2014). The present study advances the literature by theorizing that export intensity creates 'external',

international pressures that lead to environmental sustainability among firms in a regional cluster and tests this postulate.

Second, in addition to main features of regional clusters such as geographic proximity, social proximity is argued to be an accompanying feature that may additionally influence the adoption of organisational practices (Mattes, 2012; Ibarra *et al.*, 2005). Social proximity refers to shared personality characteristics and a sense of familiarity between actors (Mattes, 2012; Ibarra *et al.*, 2005), which can intensify knowledge exchange, the thickness and quality of regional linkages, and a sense of purpose for the good of the regional cluster (Basco, 2015). For example, the simple sharing of a characteristic like gender can intensify bonds between female actors in a regional cluster (Ibarra *et al.*, 2005). With respect to gender, evidence suggests that women, more so than men, are linked to a concern for the natural environment and firms' environmental performance (e.g. Diamantopoulos *et al.*, 2003; Post *et al.*, 2011). Hence, as women working in a regional cluster grows, the expectation is that because of 'within-group' familiarity, support, and a shared concern for the natural environment, social proximity is enhanced such that they are likely to exercise some level of influence over a region's environmental sustainability efforts. More specifically, the present study posits that women in leadership roles working in a regional cluster (as a proxy for social proximity) is a contingent variable, moderating the relationship between export intensity and environmental sustainability—a postulate that has yet to be tested.

Lastly, this study contributes to policy. As consumer pressure on firms to demonstrate environmental sensitivity increases (Delmas and Toffel, 2008), countries' global reputations are at stake. Rather than focus on individual firms or specific industries, policy makers may need to look more closely at regional responses and how regions can be incentivized to tackle the environmental impacts of business.

BACKGROUND AND LITERATURE REVIEW

Economic activity and environmental impacts

The economic activity of business can result in negative environment impacts, or so-called negative externalities (Porter and van der Linde, 1995). These include, among others, air and water pollution, hazardous waste, soil erosion, and even community disruption (EPA, 2015). As a means of perspective, in 2013, global carbon emissions resulting from industrial activity, and changes in land use, were 36 gigatonnes, 61 percent higher than 1990 (the Kyoto Protocol reference year), and 2.3 percent higher than 2012 (CO₂Now, 2015). Alternatively, business activity around the world produces more than 400 million tonnes of hazardous waste each year (The World Counts, 2015). The World Wildlife Fund (2012) reports that humans' footprint is exceeding the Earth's biocapacity—the productive land and ocean areas available to produce renewable resources and absorb CO₂ emissions—by more than 50 percent. The same report suggests that humans now consume 50 percent more resources than the Earth can provide and by 2030, even the carrying capacity of two planets is expected to fail our resource needs.

As scholars, NGOs, economists, and other researchers study such trends, there are beliefs that current modes of production are resulting in unsustainable environmental—if not economic—outcomes (Clark, 2007, Stern, 2007). Others suggest that many Earth system processes (e.g. climate change, biodiversity) have reached or have surpassed their biophysical limits due to human activities (Rockstrom *et al.*, 2009). Grin *et al.* (2010) go as far as to claim that modern systems of production are unsustainable and require a substantial transition in order to become sustainable.

Environmental impacts, firms, and regions

Concerns over the environmental impacts of business has led to a sense of urgency in the study of the means and methods of reducing these environmental impacts (Loorbach and Wijnsman, 2013). Environmental sustainability is an effort to reduce the impacts of business activity on

the natural environment, in order to protect and preserve natural capital for current and future generations (Russo, 2003; WCED, 1987). The locus of attention tends to be the firm. Attention is given to firms because firms are the vehicle for economic progress and growth (Henderson, 2005). However, as noted, in the process of firm economic activity, environmental degradation can be a resultant negative externality. This has sparked interest in the factors that lead firms to reduce their environmental impact.

Scholars studying factors that influence environmental sustainability report varying results. For example, in their study, Darnall and Edwards (2006) study the role of complementary resources and find that firms with existing skills in quality management and experience with pollution prevention practices incur lower implementation costs of an environmental management system (EMS). In their study, Delmas and Toffel (2008) find that firm size appears to be linked to programs and systems that reduce environmental impacts. In a study of Dutch agri-food businesses, Bremmers *et al.* (2007) find that certain stakeholders (e.g. customers, government) influence firms to reduce their environmental impact.

Lastly, there is some evidence suggesting the influence of country on the environmental sustainability of firms. For example, in a study of nine European states, Wagner (2009) finds that country location is related to the implementation of an EMS. More specifically, EMSs are associated with process innovations, yet this is moderated by the interaction of EMS implementation with country location. Evidence such as this aside, what is largely missing from the research is the empirical study of the features of regional clusters that might influence environmental sustainability among member firms.

THEORY AND HYPOTHESES

Export intensity within regional clusters

Theory suggests that being part of a regional cluster is beneficial to firms because it amplifies competitive pressure (Giuliani, 2013; Porter, 1998). Competitive pressure leads to imitation

and the diffusion of organisational practices (DiMaggio and Powell, 1983). However, perhaps a larger issue is *what* drives or creates this pressure? Some have suggested, due to close proximity, direct observation of competitors in the cluster creates pressures to ‘catch up’ (Porter, 1998). Others suggest that norms unique to a regional cluster, such as established habits or routines (Edquist and Johnson, 1997), lead to a pressure to conform (so-called ‘demonstration effects’), which spread methods of production, innovations, or ideas (Boschma, 2005). Such pressures are largely part of features contained within a *localised* context. However, internationalization has led to the need to respond increasingly to not only local pressures, but to international pressures as well (Clark and Mueller, 1996; Mayer and Whittington, 1999). Hence, this study explores a different feature of regional clusters that might increase the pressure to demonstrate environmental sustainability. More specifically, export intensity of regional clusters is examined. There are three key reasons why regional cluster export intensity is expected to diffuse environmentally sustainable practices among member firms.

First, networks of trade connect sellers in a regional cluster in one country with buyers in another country. This provides a channel for the transmission of coercive supply-chain pressures (Coe and Yeung, 2001; Smith, 2003). Porter (1990), for example, suggests that sophisticated and demanding buyers in a home market, acting through value chains, can act as catalysts for the improvement of product quality, productivity, and competitiveness of domestic supplying firms. However, the exercise of coercive power by influential international buyers and its influence on organizational behaviour can be observed as well. For example, Hughes (2000) documents how floricultural suppliers from Kenya are required to meet strict requirements regarding production processes and quality that are set by major retailers in the United Kingdom. Similarly, wine producers who export face considerable pressure, particularly from large retailers, to demonstrate environmentally sound business practices and

production processes (Marshall *et al.*, 2005; Marshall *et al.*, 2010; Rigby *et al.*, 2007; Strachan, 2007; WFA, 2007). Hence, as regional clusters intensify their exports, there is reason to believe that coercive pressure from international buyers could lead to the diffusion of organization practices that reduce environmental impacts among member firms in that cluster (DiMaggio and Powell, 1983).

Second, the economic geography literature argues that close geographic proximity between firms facilitate the adoption and diffusion of organizational practices (e.g. Camagni, 1991; Feldman, 1994; Jaffe *et al.*, 1993; Malmberg and Maskell, 2002; Martin and Sunley, 1998). However, regional clusters that demonstrate higher export orientations are likely to increase the frequency of formal and informal interactions among actors *outside* the cluster, for example, actors in foreign countries (cf. Bathelt, 2005; Belussi and Sedita, 2012; Chiarvesio *et al.*, 2010). These interactions provide opportunities to learn about the technical performance or profitability of specific organizational innovations (Gertler, 2001). Cross-border interactions also are likely to support mimetic-type behaviour whereby firms imitate the practices of others they perceive as especially legitimate or successful, or where they feel the pressure of international institutional expectations regarding their own practices back home (DiMaggio and Powell, 1983). As the export orientation of firms in a regional cluster intensify, and thus global best practice is likely to be more readily observed or international expectations more readily felt, there is expected to be a higher degree of mimetic pressure to adopt practices that reduce environmental impacts among member firms.

Third, the last 20 to 30 years has seen considerable international focus on climate change, global warming, deforestation, and other environmental concerns. Environmental impacts transcend local, regional, and national boundaries and are world-wide in the sense that there is a global responsibility to respond (Grin *et al.*, 2010). Global responsibility has perhaps been best exemplified with the Kyoto Protocol ratified in 1990 through to, at the time of this

study, the most recent climate talks in Paris in 2015. While there has been much debate among nations regarding carbon emission reduction targets, nonetheless an awareness has been increased regarding the environment, and the actions needed to reduce environmental impacts (Pinske and Gasbarro, 2016). Hence, normative pressures are likely to influence the adoption of practices that reduce environmental impacts as a means to gain legitimacy (DiMaggio and Powell, 1983). Gaining legitimacy would be expected to particularly be the case where a regional cluster intensifies its exporting efforts. As export intensity increases, the normative pressures on firms within the regional cluster to reduce environmental impacts, in an effort to meet global values and moral commitments, are expected to be greater. Hence:

Hypothesis 1: Regional export intensity is positively associated with environmental sustainability.

Contingencies (women in leadership roles as a proxy for social proximity)

Mattes (2012) suggests that regional clusters demonstrate many different features, such as different types of proximity. Spatial or geographic proximity, for example, has long been thought to advantage firms in a regional cluster over those firms that are isolated (Boschma, 2005; Giuliani, 2013). However, other forms of proximity are also features of regional clusters (Mattes, 2012). More specifically, social proximity is a feature of regional clusters that tends to received limited empirical study (Adjei *et al.*, 2016; Mattes, 2012).

Social proximity generally refers to shared personality characteristics and a sense of familiarity between individual actors (Ibarra *et al.*, 2005; Mattes, 2012). One such characteristic, gender, is expected to intensify the bonds between women who work in a regional cluster, such that they are likely to spread knowledge and insight about certain organisational practices for the good of all firms within the cluster (cf. Adjei *et al.*, 2016; Pooley *et al.*, 2005). With respect to the specific case of environmental sustainability, women, more so than men, appear to be more attuned to, and may have more influence over,

environmental issues (e.g. Diamantopoulos *et al.*, 2003; Post *et al.*, 2011). Hence, there are at least two key reasons why women would be expected to attenuate the relationship between regional cluster export intensity and member firms' demonstration of environmental sustainability.

First, women have been shown to demonstrate a higher concern for the natural environment than men (Diamantopoulos *et al.*, 2003), while engaging more frequently in environmental behaviour than men (Davidson and Freudenburg, 1996). Women's environmental 'conscience' is likely beneficial with respect to export markets. For example, as women take up leadership roles and have influence on firm strategy and direction, they would be expected to be readily aware of growing consumer interest in environmental sustainability and products that demonstrate environmental sensitivity (cf. Natividad 2005). Thus, as women appear to be more conscious of firms' environmental responsibilities than men (Diamantopoulos *et al.*, 2003), and have values and beliefs that lead them to take action in these areas (Post *et al.*, 2011), they would be expected to advocate on behalf of stakeholders to ensure that environmental sustainability is addressed (cf. Russo and Earle, 2010).

Second, some scholars suggest that regions are the battleground for environmental sustainability (Etzion and McMahon, 2012; Gibbs, 2006; Russo, 2003; Russo and Earle, 2010). For example, natural environmental issues, such as climate change, are largely regional in impact (e.g. Hannah *et al.*, 2013; Hughes, 2011). Following Etzion and McMahon (2012a), Russo (2003) and Russo and Earle (2010), regional clusters face increasing pressure to compete on the basis of their environmental credentials. Pressure is being manifested in a few ways. One way relates to negative externalities. If a regional cluster incurs an environmental accident or has a negative environmental reputation, economic impacts can be severe for member firms in the form of decreased demand for products, loss of image, or increases in legal requirements (Bansal and Roth, 2000).

Alternatively, a strong reputation for environmental responsibility in a regional cluster may constitute a competitive advantage (Russo, 2003; Russo and Earle, 2010). Where business strategies have positive externalities, the more firms that adopt the strategy, the higher the likelihood that those firms will receive benefits (Hill, 1997; O'Neill et al., 1998). Therefore, regional clusters make evident that the environmental behaviour of other actors in the field can benefit individual firms (Jennings and Zandbergen, 1995). Evidence suggests that export markets are, in fact, sensitive to the regional environmental credentials of their product suppliers and therefore non-compliant behaviour among a few firms can affect the reputation of the entire region (Rigby *et al.*, 2007; WFA, 2007).

Women demonstrate higher levels of environmental sensitivity than men. As women working in leadership roles within a regional cluster grows, because they share similar personality characteristics, a sense of familiarity due to 'within-group' identification, and a sense of community (Pooley *et al.*, 2005; Tajfel, 1974; Turner *et al.*, 1987), social proximity would be expected to be deepened. In fact, evidence suggests that women in leadership roles are three times more likely to be in a network that is mostly female (McKinsey & Company, 2016). Hence, social proximity through membership in a social network (i.e. gender) is expected to enhance trust and the chance of reciprocation (Boschma, 2005; Saxenian, 1999). As trust and embeddedness is enhanced, women in leadership roles would be expected to more freely engage in the exchange and transfer of knowledge about activities and practices surrounding environmental sustainability. A flow-on or spillover effect could lead to increasing influence on the types of organizational practices adopted within the region (Boschma, 2005; DiMaggio and Powell, 1983). More specifically, the expectation is that as women working in leadership roles in a regional cluster grows, they would be in a position to build, diffuse, and protect the environmental credentials (and thus, legitimacy) of the regions within which they work, so that export markets can be ensured of environmentally sustainable credentials. Hence:

Hypothesis 2: The relationship between regional cluster export intensity and environmental sustainability is positively moderated by an increase in women in leadership roles in a regional cluster.

METHODS

Sample and data collection

To examine the posited hypotheses, regional wine clusters in Australia are studied. Wine clusters are well-suited for this particular study as the extent to which they address environmental issues is rapidly growing (e.g. Atkin *et al.*, 2012; Rigby *et al.*, 2007; WFA, 2007). Following Krugman (1991) and Shaver and Flyer (2000), state boundaries are used to define regional clusters, which matches the way that Wine Australia, the Government statutory body for the wine industry in Australia, classifies wine clusters in the country. Four regional clusters are included: 1) New South Wales; 2) South Australia; 3) Victoria; and 4) Western Australia. These four regional clusters comprise 99 percent of wine export sales value in Australia. Table 1 provides an overview of key features of each regional cluster, while Figure 1 provides a graphical view of the regional clusters in terms of their location within Australia (wine production is shaded).

[insert Table 1 here]

To collect data on the dependent variable, a survey was used. Company and respondent names were drawn from the Winetitles database. Winetitles is a major publisher of wine-related materials, including the *Australia & New Zealand Wine Industry Directory* ('Directory'). The Directory provides coverage of all wineries in Australia and is updated annually. Data include names of wineries, addresses, locations, key personnel, and a host of fields covering details about operations and production. For this particular study, the CEO (or equivalent) was the targeted respondent for the survey.

[insert Figure 1 here]

For New South Wales, there are 475 wine companies; for South Australia, 680 wine companies; for Victoria, 754 wine companies; and for Western Australia, 387 wine companies. After an initial mailing and two follow ups, 91 useable responses were received from New South Wales (19 percent response rate), 207 useable responses from South Australia (30 percent response rate), 241 useable responses from Victoria (32 percent response rate), and 107 useable responses from Western Australia (28 percent response rate). This equates to 646 useable surveys and the response rates are well in line with studies of the wine industry (Atkin *et al.*, 2012). To test for response bias, I compared responding firms to non-responding firms on two key variables, firm size and firm age, and no differences were found. Hence, non-response bias is unlikely to be a problem.

Variables

Environmental sustainability. There does not appear to be agreement around how to measure environmental sustainability in the wine industry, nor is there a common scale. Hence, following the formative construct convention (Bollen and Lennox, 1991), a literature review was undertaken to identify items that would serve as an index of environmentally sustainability actions. After consultation with academic and scientific experts in the fields of wine production and sustainability, and reference back to the literature, an index of seven items was compiled (Appendix). Environmental sustainability is therefore a formative construct, consisting of seven actions.

To measure environmental sustainability, respondents were asked to assess each action on a seven-point Likert scale, ranging from 1 = not applicable to 7 = implemented (see Appendix). To assess these formative indicators, regression analysis revealed that significant collinearity was not present between the actions in the environmental sustainability index (highest VIF of 1.66). This provides *prima facia* evidence that formative indicators are suitable (Diamantopoulos and Winklhofer, 2001).

Regional export intensity. To measure regional export intensity, I relied on data from Wine Australia (described above). Wine Australia supplied a database of wine export sales volume (in Australian dollars), by regional cluster.¹ To measure export intensity, each region's export sales volume was divided by the total of national export sales volume. I then created a seven-point Likert scale, where 1 = < 1% of export sales volume; 2 = 1%-4% of export sales volume; 3 = 5%-9% of export sales volume; 4 = 10%-15% of export sales volume; 5 = 16%-25% of export sales volume; 6 = 26%-35% of export sales volume; and 7 = > 35% of export sales volume. Firms were assigned a number from the scale based on the appropriate regional cluster export percentage category.

Women in leadership roles (a proxy for social proximity). To measure women in leadership roles, four different roles are used: 1) CEO; 2) marketing manager; 3) winemaker; and 4) viticulturist. CEO and marketing management roles relate directly to strategy, resource allocation decisions, setting goals and objectives, creating an ethical culture, marketing and promotion, and product sales. Winemakers are involved in all aspects of the technical side of making wine including crushing and pressing grapes, fermentation, filtering, quality control, and new product development such as new blends. Viticulturists oversee and manage the vineyard and the technicalities of grape growing, and increasingly rely on scientific techniques and technology to produce optimal grape quality. Given their responsibilities, these four roles constitute roles of leadership within a wine firm. Gender for each role was identified by using the Winetitles database.

For measurement, women in each role was examined, by regional cluster. More specifically, I examined whether or not there were women in the four roles, noted above, in each firm. To create the women in leadership roles variable, the average percentage of women across all roles was calculated, by regional cluster. A seven-point Likert scale was then created,

¹ As the volume (\$) goes up, this suggests that exports are growing, or intensifying.

were 1 = < 5%; 2 = 5% to 10%; 3 = 11% to 15%; 4 = 16% to 20%; 5 = 21% to 25%; 6 = 26% to 30%; 7 = > 30%. Firms were assigned a number from the scale based on the appropriate percentage of women in leadership roles in the specific regional cluster. Following Mattes (2012), gender is a characteristic of social proximity. Therefore, in line with Adjei *et al.* (2016) and Ibarra *et al.* (2005), I argue that gender (i.e. women in leadership roles) serves as a reasonable proxy for social proximity in the specific case of this study.

Control variables. To account for their effects, several control variables are used. Because firms that are larger may have more resources to invest in environmental sustainability (Atkin *et al.*, 2012), firm size is measured by number of cases of wine produced annually, where 1 = up to 2,499 cases; 2 = 2,500 to 19,999 cases; 3 = 20,000 to 99,999 cases; 4 = 100,000 to 1,499,000 cases; and 5 = over 1,500,000 cases. Older firms may have had longer exposure to isomorphic processes related to environmental sustainability (Slawinski and Bansal, 2012); hence, firm age is controlled for by measuring number of years since founding. In the wine industry, firms operating in so-called ‘elite’ sub-clusters within a given region may have more incentive, or motivation, to be on the leading edge of innovation (Costley, 2012; Cross *et al.*, 2011; Schmitt, 2013), such as environmentally sustainable innovations. In this case, elite sub-clusters include Barossa Valley (South Australia); Hunter Valley (New South Wales); Margaret River (Western Australia), and Port Philip (Victoria). Elite sub-regions were determined by reference to Australia’s leading wine writer and critic, James Halliday, who annually publishes the *Australian Wine Companion*. Firms in elite sub-clusters were coded 1, 0 otherwise.

With respect to other controls, given that the size of the regional cluster can influence the outcomes of member firms (Folta *et al.*, 2006; Poudier and St. John, 1996), I created a variable where 1 = 1 to 100 firms in the regional cluster; 2 = 101 to 200 firms in the regional cluster; 3 = 201 to 300 firms in the regional cluster; 4 = 301 to 400 firms in the regional cluster; 5 = 401 to 500 firms in the regional cluster; 6 = 501 to 700 firms in the regional cluster; and 7

= > 700 firms in the regional cluster. Firms were assigned a number from the scale based on the size of their regional cluster. I also created dummy variables for each regional cluster. Firm age was taken from company websites, while, where appropriate, other control variables were taken from the Winetitles database.

RESULTS OF THE EMPIRICAL STUDY

Means, standard deviations, and correlations are presented in Table 2. Although there are significant correlations between some of the control and predictor variables, the correlations are below 0.80. Correlations below 0.80 minimizes concerns over multicollinearity (O'Brien 2007). Further, the highest variation inflation factor (VIF) of 5.594, and the lowest tolerance value of .252, are considered within acceptable standards (O'Brien 2007), providing further evidence that multicollinearity is unlikely to be problematic.

[insert Table 2 here]

Table 3 presents the results of the moderated hierarchical regression analysis. Prior to analysis, interaction variables were centred. In Step 1, the control variables were entered; in Step 2, the independent variable was added; and in Step 3, the interaction variable was added. Significant interaction indicates a moderating effect (Baron and Kenny, 1986). Hypothesis 1 posits that regional export intensity will be positively associated with environmental sustainability. As shown in Model 2, there is support for this hypothesis, as regional export intensity is significant and positively associated with environmental sustainability among member firms ($\beta = 0.29; p < 0.01$).

Hypothesis 2 states that the relationship between regional cluster export intensity and environmental sustainability will be positively moderated by women in leadership roles in a regional cluster. Model 3 suggests that there is support for this hypothesis, as the interaction term is positively associated with environmental sustainability ($\beta = 0.35; p < 0.001$). To help interpret this finding, I plotted the interaction term in Figure 2. The positive effect of export

intensity is more likely to be observed when there are higher levels of women in leadership roles in the regional cluster.

[insert Figure 2 here]

CONCLUSIONS

This study analyses the influence of regional cluster export intensity on environmentally sustainable practices among member firms. Further, the paper explores the influence of women in leadership roles in a regional cluster on the connection between export intensity and environmental sustainability. The research contributes to prior literature on the features of regional clusters that lead to the diffusion of organizational practices. Firstly, as regional clusters increase their exports, this appears to stimulate higher implementation rates of environmentally sustainable practices among member firms. Global markets can expose firms to new pressures in terms of expectations around organizational practices and processes. As these pressures bear on firms in regional clusters, isomorphic processes are amplified such that member firms seek to conform to expectations, creating diffusion effects with respect to organizational practice and process adaptation. Other studies have found that, for example, features of the local context in regional clusters, such as local institutions, create pressures on firms to conform to expectations around environmental sustainability (Grimstad and Burgess, 2014). Perhaps a noted characteristic of the present study is that exposure to external environments, such as export markets, may also open up firms in regional clusters to new, if not heightened, pressures that lead to a coercive, mimetic, and normative isomorphism (DiMaggio and Powell, 1983).

Secondly, this study shows that as women in leadership roles grow in a regional cluster, they appear to increase the relationship between export intensity and environmental sustainability. This study explains, and provides some evidence for, how a feature of regional clusters such as social proximity might influence environmental sustainability due to gendered

characteristics and traits. Previous research has shown that, for example, the number of family members in a firm, as a proxy for social proximity, positively impact on the outcomes of firms in regional clusters (Adjei *et al.*, 2016). Social proximity creates mutuality and an embeddedness among actors that facilitates knowledge exchange and learning about new technology (Boschma, 2005; Mattes, 2012), and is expected to facilitate support for common issues facing a regional cluster (cf. Pooley *et al.*, 2005). This level of support would particularly be the case with respect to environmental sustainability: as regions become more female gendered in terms of their leadership, there is expected to be the demonstration of a high level concern for the natural environment (Carlsson-Kanyama *et al.*, 2010; Diamantopoulos *et al.*, 2003). The results show that regional cluster export intensity can enhance environmental sustainability among member firms and that this relationship can be more intense if there is an overall greater representation of women in leadership roles in the cluster.

Theoretical implications

This study extends research on economic geography and agglomeration. First, substantial research attention has been given to features of the *local* context of regional clusters, such as geographical proximity (Boschma, 2005; Knobens and Oerlemans, 2006). For example, co-located firms can observe each other and they deal with the same local institutions or industry associations. Such closeness is expected to advantage co-located firms in terms of innovation and performance. However, there is some debate as to what extent the ‘local’ context is the only source of advantage or influence on the diffusion of organizational practices (e.g. Carbonara, 2005; Malmberg, 2003; Martin and Sunley, 2003). This study asserts that exporting within a regional cluster exposes firms to influences outside the local milieu as they interact with international actors. In the case of environmental sustainability, these include coercive, mimetic, and normative pressures placed on firms through international exposure and networks. The findings suggest that as the export intensity of regional clusters grow, and thus,

so does the expected international exposure, this appears to have a positive impact, or spillover effect, on the implementation rates of environmentally sustainable practices among member firms. Hence, features of regional clusters are not necessarily limited in the sense that they are locally constrained (c.f. Carbonara, 2005; Malmberg, 2003; Martin and Sunley, 2003), but rather that they may also include external aspects that can shape the diffusion of organizational practices. One implication is that there is likely a dynamic between the advantages of a local milieu and the realities of operating in global environments, particularly through the export efforts of the regional cluster.

Second, Boschma (2005) posits that in addition to geographic proximity, regional clusters demonstrate other dimensions of proximity. These include cognitive, organizational, social, and institutional proximity. Of these, Adjei *et al.* (2016) note that social proximity has received little empirical investigation. Following their lead, this study extends studies of social proximity in regional clusters. Social proximity originates from the work of Granovetter (1985) and the concept of embeddedness. Embeddedness suggests that economic actors are, to some extent, embedded in a social context. Embeddedness leads to social ties that effect outcomes (e.g. economic, innovation, etc.). The more socially embedded are the actors, the greater the chance of learning, knowledge diffusion, and innovation. This study posits that women in leadership roles represent a proxy for social proximity. Women share common traits and characteristics, a sense of kinship, and experience (Eagly *et al.*, 2003). These shared characteristics are expected to lead to greater social ties (Boschma, 2005; Mattes, 2012). Women also demonstrate a higher level of concern for the natural environment than do men. Hence, as more women ascend to leadership roles within a regional cluster, they are expected to be in a position to facilitate knowledge exchange, learning, and influence over environmental sustainability. The results suggest that the increase of women in leadership roles do moderate the relationship between regional cluster export intensity and environmental sustainability

among member firms. In the same vein as Adjei *et al.* (2016) (who use the number of family members as a proxy for social proximity), this investigation therefore further enriches an understanding of how social proximity might influence outcomes in regional clusters. The study also expands insight into features of regional clusters and their influence on the adoption of organizational practices.

Managerial implications

Among implications for management, this study suggests actions, first to carefully consider environmental sustainability as a practice to adopt, and second to increase the representation rates of women in leadership roles. As to the first issue, Bansal and Roth (2000) suggest that an environmental accident or a given regional cluster's negative reputation with respect to the environment could entail a customer backlash, resulting in decreased demand, economic losses, a loss of image, or increased legal requirements. Of importance is that such negative consequences might not only effect the individual firm causing any environmental damage, but all firms in the regional cluster. Alternatively, positive externalities may result from firms in a regional cluster that more readily implement environmentally sustainable business practices. That is, the more firms adapt environmentally sustainable business practices, the higher the benefits are expected to be for the regional cluster (cf. Hill, 1997; O'Neill *et al.*, 1998). Hence, whether firms export or not, there could be a positive spillover effect on a regional cluster that demonstrates sensitivity to the natural environment.

Second, women have long been promoted as having skills, experiences, traits, characteristics, and values that, while differing from that of men, are expected to have positive influence on various firm outcomes, including economic performance (Post and Byron, 2015), corporate social responsibility and firm reputation (Bear *et al.*, 2010), and innovation (Miller and Triana, 2009; Torchia *et al.*, 2011), among others. Yet, women clearly remain underrepresented in leadership roles, where they are particularly expected to have influence

over organizational strategy and practice. For example, various agencies and reports (e.g. Catalyst reports, Davies Report, European Commission, Higgs Report) demonstrate that the percentage of women on corporate boards of directors is well below that of men. For example, in Australia, women on boards stand at around 16 percent; in China 7 percent; in Hong Kong 9 percent; in Japan less than one percent; and in the US 16 percent. In other cases, women in CEO roles in the Australian Securities Exchange (ASX) top 500 firms stands at approximately 3 percent (WGEA, 2012). Similarly, in the UK, women CEOs in the FTSE350 stood at 3 percent in 2013 (HRReview, 2013). In the US, the percentage of women CEOs in the Fortune 500 was 4.4 percent in 2013 (Catalyst, 2014). In Germany, in 2013, firms in the major DAX 30 index did not boast a single woman CEO (Marcus Evans, 2013). Given the empirical evidence noted above with respect to the value that women in leadership roles appear to deliver, and the specific results of this study regarding environmental sustainability, firms in regional clusters should consider ensuring that their leadership roles become more gender diversified. Such a move could improve the overall competitiveness and reputation of the regional cluster.

Policy implications

The regulatory space for environmental sustainability tends to target individual firms or industries. However, scholars such as Porter (1990) argue that national competitiveness is, in part, a result of strong regional clusters. Policy makers could therefore consider aiming environmental policies, while encouraging voluntary effort, at a country's regional clusters. Because regional clusters can have significant effects on national reputation (Porter, 1990), encouraging regional clusters to become more environmentally friendly might bring attention away from individual firms and any feeling of clearing 'hurdles' in isolation; rather, a common effort by the region might stimulate a greater sense of purpose and a perception that individual firms do not have to go it alone. Further, policy makers could consider levers in the form of financial incentives (e.g. tax breaks or incentives) for regional clusters that demonstrate efforts

to reduce environmental impacts. In other words, the greater the *regional* uptake of environmentally sustainable practices, the greater the incentives for firms in those regional clusters.

Limitations and future research

This study is not without limitations. First, only regional wine clusters in Australia are examined. Relying on one type of regional cluster and one country does limit generalizability of the results. Future research could explore different types of regional clusters (e.g. IT, clothes manufacturing, etc.) and different countries (e.g. Brazil or China). Second, another limitation has to do with measurement. For example, there are potentially other ways to measure export intensity. These could include the number of countries that a regional cluster exports to or different measures of the volume (i.e. litres) of exports. However, access to data on alternative measures was not available. I argue that sales volume (\$) is a good measure to indicate the intensity of exports, and the degree to which regional clusters are likely exposed to external, international influences. Future research could explore alternative measures of export intensity. Third, and similarly, women in leadership roles might not be a perfect proxy for social proximity. I followed the lead of Adjei *et al.* (2016), who use the number of family members as a proxy for social proximity. In reality, there does not appear to be much empirical research on social proximity, nor does there appear to be a standardized or benchmark measure of this feature of regional clusters. Further research is therefore needed to continue to expand measurement of social proximity in the study of regional clusters.

APPENDIX

Environmentally sustainable practices^a

1. Use of alternative energy sources (e.g. 'green' power, solar, wind) in the overall production of wine.
2. Use of alternative packaging to bottle wine (e.g. lightweight glass bottles, plastic PET bottles, recycled bottles).
3. Reduction of refrigeration loads (e.g. night-time air cooling, timing of loads).
4. Energy efficient technology in buildings (e.g. variable speed devices, computer-controlled lighting; use of thermal efficient materials).
5. Minimizing the use of agrichemicals (e.g. petiole analysis, optical weed spray controllers).
6. Alternative fuel use (e.g. biodiesel, ethanol) to power tractors, utility vehicles, machinery, etc.
7. Carbon sinks/sequestering (e.g. reduced tillage, use of compost, planting of shrubs, hedgerows, or trees).

^a. 7-point scale were 1 = not applicable, 2 = not considering, 3 = future consideration, 4 = assessing suitability, 5 = planning to implement, 6 = implementing now, and 7 = implemented.

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Tables

Table 1. Regional cluster profiles

	New South Wales wine cluster	South Australia wine cluster	Victoria wine cluster	Western Australia wine cluster
Area of winegrapes:	39,097 ha	71,310 ha	25,409 ha	10,556 ha
Number of firms:	475	680	754	387
Average age of firms:	29.57 years	29.31 years	25.91 years	21.46 years
Export sales volume (\$):	AUD\$471,642,458	AUD\$715,082,140	AUD\$618,960,761	AUD\$44,721,400

Table 2. Descriptives

Variable	Mean	SD	1	2	3	4	5	6	7
1. Environmental sustainability	4.21	1.39	1.00						
2. Firm size	1.80	0.90	0.24**	1.00					
3. Firm age	26.56	30.99	0.12**	.37**	1.00				
4. Elite sub-cluster status	0.39	0.49	-0.07	0.05	-0.03	1.00			
5. Regional cluster size	5.90	1.08	-0.04	-0.11**	0.03	0.02	1.00		
6. Regional export intensity	5.51	1.70	0.02	0.04	0.07	0.02	0.45**	1.00	
7. Women in leadership roles	2.83	0.37	0.31**	0.19**	0.06	0.01	-0.02	0.02	1.00

* $p = 0.05$; ** $p = 0.01$

Table 3. Results

Variables	Model 1	Model 2	Model 3
	Control variables	Direct effects	Interaction effects
	β	β	β
Firm size	0.23**	0.35***	0.34***
Firms age	0.15 [†]	0.11	0.11
Elite sub-cluster status	0.03	-0.07	-0.10
Regional cluster size	-0.24**	-0.22**	-0.22**
Regional cluster dummies	Included	Included	Included
Regional export intensity		0.29**	0.30***
Women in leadership roles		0.40***	0.38***
Regional export intensity x women in leadership roles			0.35***
<i>R</i>	0.38	0.44	0.50
<i>R</i> ²	0.14	0.19	0.25
<i>F</i>	10.38***	8.70***	10.37***
ΔR^2		0.05**	0.06***

n = 649

[†] *p* < 0.10

* *p* < 0.05

** *p* < 0.01

*** *p* < 0.001

FIGURES

Figure 1. Regional clusters under study



Figure 1. Plot analysis

