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**Firm Resources and Environmental Sustainable Development among SMEs: Evidence  
from the Australian Wine Industry**

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**Keywords** Sustainable Development, Environmental Sustainability, Firm Performance, Firm Resources, SMEs, Wine Industry

**Abstract**

Scholars and industry professionals are asking for clarification of the specific firm resources that influence the adoption of environmental sustainable development strategies. This article, set in the context of the Australian wine industry, explores different firm resources that are beneficial for environmental sustainable development and examines the role of management attitudes and norms in moderating this relationship. It establishes which resources SMEs should invest in to be more likely to follow environmental principles. This study reports the findings of a survey of the owner-managers of Australian SME wine producers. It utilises PLS-SEM to analyse the data. Results clearly identify that successful firms that manage their resources more effectively influence the application of environmental behaviour, with one distinct resource significantly influencing the disclosure of such behaviour. A moderating effect is established which supports the notion that pro-environmental decision-making in SMEs is heavily influenced by the attitudes and norms held by management.

## Introduction

Firms that possess superior resources are more likely to gain competitive advantages in the marketplace (Runyan, 2007; Dangelico & Pontrandolfo, 2015). One way of achieving such competitive advantage is through implementing environmental sustainability strategies, as today's society demands environmental accountability. Some commentators voice concern that implementing and communicating environmental strategies is costly (Gemrich & Arnold, 2007). Existing research findings differ between establishing a positive association between environmental behaviour and reaping rewarding results (Blacconiere & Patten, 1994; Forbes *et al.*, 2009; Klassen & McLaughlin, 1996; Lo & Sheu, 2007; Schnietz & Epstein, 2005), and identifying a negative relationship between the same variables (Chen & Metcalf, 1980; Jaggi & Freedman, 1992; Wagner *et al.*, 2002). A possible explanation of the negative relationship between environmental sustainability behaviour and performance is that businesses that are investing in environmental efforts might do so at a cost to profitability (Lo, 2010). By implication therefore, behaving in a pro-environmental manner is perhaps easier for resource-rich companies that are better able to absorb such costs, whilst acting as a potential barrier for companies with fewer resources available to achieve this. Environmental firm behaviour is often simultaneously undertaken with disclosing such behaviour to stakeholders, as the public demands organisational accountability and transparency (Blok, 2008). Thus, this research aims to investigate the role of firm resources in driving environmental behaviour and its disclosure.

Although there are a number of extant studies of firm resources, environmental behaviour and environmental disclosure these mainly look into the effect of environmental behaviour and disclosure on firm resources such as firm performance (Al-Tuwaijri, *et al.*, 2004; Cormier, *et al.*, 2004; Richardson & Welker, 2001). This investigation contributes to the literature by adopting the Resource-Based View (RBV) of the firm perspective (Wernerfelt, 1984). It aims to discover, in the context of the Australian wine industry, whether behaving positively towards the environment and disclosing it, is a luxury that is reserved only for successful firms. As well as resources being required for environmental behaviour, we argue that they are also a key factor in influencing environmental disclosure.

Moreover, the research presented here, following the norm-activation theory of altruism (Schwartz, 1977, Stern *et al.*, 1999) - which states that pro-environmental actions are

executed in response to personal moral norms about such actions - considers the role of managerial attitudes towards the environment in affecting environmental behaviour and disclosure. The Australian wine industry is characterised by a high incidence of Small and Medium-Sized Enterprises (SMEs), and these are strongly influenced by the firm's owner/manager's norms and attitudes due to company size and flat hierarchies (Cordano *et al.*, 2010). Thus managers' norms and attitudes are regarded as creating either positive or negative surroundings for environmental behaviour and disclosure, leading to a strengthening or weakening of the likelihood of environmental strategy implementation. It is therefore proposed that these psychological characteristics of SME decision-makers act as a moderator of the relationship between a firm's resources, and environmental behaviour and environmental disclosure.

Whilst previous research has measured the relationship between similar variables considering the RBV perspective, resources are commonly seen as mediators (Ko, 2016) or tested as outcome variables (Wagner, 2015). So this study is unique in its contribution to understanding the role of a firm's resources as antecedents to its environmental activities, and their disclosure by the business. It also adds to the body of literature concerning the RBV of the firm, with a particular focus on SMEs, as recent research suggests an identifiable link between firm size and environmental disclosure (see for example Lee, 2017). Furthermore, this study provides important insights for managers and policy makers who aim to enhance environmentally sustainable behaviour and disclosure by highlighting which specific resources promote such actions in SMEs.

The remainder of this article is structured as follows: The literature on SMEs and environmental sustainable behaviour will be initially presented followed by discussion of the role of business performance in relation to environmental behaviour and environmental disclosure. Environmental behaviour and environmental disclosure in the wine industry will then be considered, together with a review of its association with firms' resources. Subsequently the potential influence of managers' attitudes and norms will be discussed, and the study's hypotheses proposed. Following this the research design and methods are explained and the empirical results presented. The discussion then draws linkages between extant studies and the research findings. In the final section consideration is given to the implications for theory and practice together with the study's limitations and avenues for further investigation.

## **Conceptual Background and Hypothesis Development**

### *Small and Medium-sized Enterprises and Environmental Sustainable Behaviour*

SMEs are starting to be recognized for their importance in the global economy as strong Corporate Social Responsibility (CSR) carriers, with specific plans being established by institutions such as the EU and UN that SME's should adopt CSR strategies (Lopez-Perez et al., 2017). It is acknowledged that SMEs find it more difficult to implement sustainable and CSR strategies (Halme & Korpea, 2014) and thus authors in the field ask for more research on understanding the drivers for SMEs to take part in CSR activities (Baumann-Pauly et al., 2013). Current research on the management of environmental sustainability development among SME's highlights varying findings with regards to firm size. Lopez-Perez et al. (2017) for example find that CSR among SME's effects corporate reputation, brand image and financial performance. When specifically reviewing the moderating role of firm size, it was demonstrated that the larger the firm, the bigger the impact of CSR on corporate reputation and financial value (Lopez-Perez et al., 2017). Other research acknowledges similar findings with regard to firm size, but also recognizes the importance of knowledge of sustainability management tools as hindering SME's from being as successful in implementing sustainability development compared with their larger counterparts (Hörisch et al., 2015). Another reason for SME's being less successful when engaging in sustainable practices is commonly observed as their limited access to financial resources (Lopez-Perez et al., 2017). However SME resource availability and, in particular its relationship with business performance is complex and multi-faceted, especially in the context of environmental sustainable development in the Australian wine industry.

### *Business Performance as an Indicator of Firm Resource Availability*

Runyan (2007) outlines how Sustainable Competitive Advantage (SCA) can be gained by firms through possessing superior resources. In order to achieve SCA, resources must be heterogeneous and imperfectly mobile (Barney, 1991; Coviello & Cox, 2006; Lado & Wilson, 1994). These resource requirements are achieved by fulfilling the criteria of: value, rarity, inimitability and non-substitutability (Barney, 1991; Meso & Smith, 2000). Management and financial resources are stressed as being crucial when establishing the relationship between environmental behaviour, environmental disclosure and economic performance (Al-Tuwaijri *et al.*, 2004; Ullmann, 1985).

Australian wineries possess a number of these resources, which if managed properly function as key firm performance indicators. For example strong brands are seen as an important resource of successful wine businesses. Pugh & Fletcher (2002) stress that Australia's success is not due to its ability to produce quality wines at reasonable prices but instead the skill of Australian wine companies to build brands that compete internationally and perform strongly in regard to this. Australian wine producers also generate a large amount of revenue through the cellar door in the form of wine tourism services (Cambourne & Macionis, 2000). Thus strong performance in attracting visitors to the vineyard and fulfilling their needs provides another important resource for a winery. In addition, sufficient financial means are a valuable resource to support market development strategies (Mahoney & Pandian, 1992), and wineries that are in a strong position with regard to their financial performance are therefore more likely to be able to invest in activities to secure existing markets as well as develop new markets (Westhead *et al.* , 2001). This is particularly evident in recent research when related to the development of new international markets (Pellicanò & De Luca, 2016). Strong financial performance leading to the availability of capital can also provide a buffer for a firm against random shocks (Bruderl, *et al.*, 1992), and enable it to learn and overcome problems (Cooper, 1994). Finally, a key resource in the wine industry is innovativeness. Ritchie & Crouch (2000) find that firms can enhance their competitiveness through performing well in terms of innovation. Technology adoption when changing to organic and biodynamic production methods is essential, and research indicates that businesses that are keen to develop technology will outperform those who do not (Dwyer & Kim, 2003).

Despite many claims that environmental certification and behaviour is costly (Gemrich & Arnold, 2007, Lo, 2010; Synergy, 2000), and consequently requires access to significant resources, no research to date in the wine industry has looked at the role of different aspects of successful business performance, in the form of owning valuable resources, as an antecedent to environmental behaviour and disclosure. This dearth of research might be because the measurement of resource availability in the wine industry is challenging. Extant studies are mainly reliant on accountancy data of large sized companies rather than self-reported management data, which is not available in the wine industry where SMEs predominate. The result is that SMEs have often been excluded from such investigations. This is a particular problem as SME's are generally regarded as being deficient in financial resources, so it is especially important to see how other resources might be helpful in the quest to become more environmentally friendly. Another limitation of the previous research

is the sole reliance on the measurement of a business's financial performance, with stock market information often being used as an objective company performance measure (Lo, 2010). However, the Australian wine industry consists mainly of SMEs usually run as family businesses. Therefore, objective published performance figures related to revenues and profits are often impossible obtain for these businesses.

### *Environmental Behaviour in the Wine Industry*

The wine industry has experienced its share of criticism for its impacts on the society and environment (Baughman *et al.*, 2000). Striving towards a more sustainable future has been on the forefront of many businesses' agenda. Societal goals include maintaining our planet for future generations to guarantee the future wellbeing of human kind (Belz & Peattie, 2009), with the use of pesticides, herbicides, and the wasting of scarce water resources being just some of the environmental issues that winery managers are facing. Additionally, conflicting land-use options (Baughman *et al.*., 2000) and a heavy 'carbon footprint' (Barber, 2010; Colman & Păster, 2009) are other environmental concerns that may be associated with this industry; despite it being ahead of other food producers in steering its business practices in an environmentally friendly direction. Indeed, many wine producers have started to show commitment to overcoming environmental issues by abandoning chemical fertilizers in the vineyards, restoring natural animal habitats, as well as re-using water (Pullman *et al.*., 2010). The Australian wine industry in particular provides a valuable arena for the study of environmental behaviour and disclosure as it is a major player in the global wine industry and offers the opportunity for comparative analysis. There has been a plethora of general sustainability studies in Australia (Lockie, 2002; Patterson, 2006) as well as sustainability research conducted specifically in the wine industry (Alonso & Northcote, 2009; Waye, 2008, Remaud *et al.*, 2008; O'Neill & Charters, 2000).

### *Business Performance as an Indicator of Environmental Behaviour*

Environmental behaviour is often discussed as potentially influencing business competitiveness (Porter & van der Linde, 1995, Clarkson *et al.*, 2011; Fujii *et al.*, 2013, Trumpp, 2017; Wagner & Schaltegger, 2004; Guenther & Hoppe, 2014). Even though some recent research finds a clear link between environmental responsibility and firm performance (Lee *et al.*, 2016) other authors question whether 'it pays to be green' or 'it costs to be green' (Trumpp & Guenther, 2017, p.51-52). They find that there is indeed a U-shaped, rather than linear, relationship between environmental behaviour and financial performance. This

establishes that good business performance is not just an outcome of positive environmental behaviour but might also be an antecedent. Gallego-Álvarez *et al.* (2014) attempted to establish the effect of both business performance and an economic crisis on the environmental behaviour of firms. By analysing panel data they found that firms that support CSR in times of economic crisis perform better. However they did not find support for the hypothesised relationship between high financial performance and good environmental practices, thus rejecting the notion (at least in times of economic crises) that financial performance might be an antecedent of positive environmental behaviour. Albertini (2017) reviewed 151 articles from 1992 to 2014 that dealt with the measurement and management of environmental performance and established the relationship between financial and environmental as the most common theme. Yet, the relationship is always considered from the viewpoint of the extent to which environmental performance affects financial performance. Additional streams of research have focused on other firm capabilities that influence the relationship between environmental and financial performance. Ko & Liu (2017) for example, find that both marketing and R&D competences mediate the relationship between financial and environmental performance indicating that the relationship only exists whilst having those competencies.

Research in the wine industry is consistent with wider research that suggests a negative relationship between environmental behaviour and business performance (Richardson & Welker, 2001). Gemmrich & Arnold (2007) identify that winemakers often highlight environmentally friendly actions as being counterproductive for wine quality and earnings. Further empirical studies show differing results with some research finding that the communication of sustainability efforts in the wine industry increases brand performance through price premiums (Barber *et al.*, 2010; Loureiro, 2003). Such price premiums however depend foremost on the product's quality rather than the fact that it adheres to environmental guidelines (Loureiro, 2003), and the positive impact of an environmentally friendly stance is therefore questionable. The negative effects of environmental behaviour on firm performance in the wine industry, and limited evidence of beneficial outcomes, suggest that wine businesses that are willing to behave positively towards the environment may have access to more resources to achieve this. From a RBV perspective this may be explained in terms of how firms can attain and sustain competitive advantage through exploiting unique resources, as it is argued that a firm requires unique resources (Wernerfelt, 1984) to be able to support environmental behaviour.



In the wine industry, such unique resources can be considered as owning strong brands (Pugh & Fletcher, 2002), being successful in attracting visitors (Cambourne & Macionis, 2000), having sufficient financial means (Mahoney & Pandian, 1992), and the innovativeness of the firm (Ritchie & Crouch, 2000). These resources are inter-related and can be regarded as together forming the overall resources of a wine business. Moreover, it could be argued that there may potentially be an overlap, or even correlation, between owning strong brands and attracting visitors, or between having sufficient financial resources and thus being able to innovate. However, the question remains as to whether any of these individual resources have a stronger association with environmental behaviour and disclosure. It is proposed that firms who own and exploit these unique resources are more likely to behave in an environmentally friendly way than firms who are less able to access such resources, and that a firm's performance in each of these areas is therefore critical to enacting a pro- environmental strategy. The following hypotheses are therefore presented initially for further investigation:

- Hypothesis 1 (H1)      Business performance is positively associated with *environmental behaviour*.**
- Hypothesis 1a (H1a)      Brand performance is positively associated with *environmental behaviour*.
- Hypothesis 1b (H1b)      Service performance is positively associated with *environmental behaviour*.
- Hypothesis 1c (H1c)      Financial performance is positively associated with *environmental behaviour*.
- Hypothesis 1d (H1d)      Innovation performance is positively associated with *environmental behaviour*.

#### *Environmental Disclosure in the Wine Industry*

Environmental disclosure is discussed in terms of the influence of stakeholders on environmental reporting (Cormier *et al.* , 2004; Robertson & Nicholson, 1996), the legal issues of disclosing environmental information (Detienne & Lewis, 2005), and firm credibility in environmental disclosure (Dando & Swift, 2003). Issues of environmental disclosure are discussed in terms of how disclosed information can be fit for diverse interest groups and purposes such as a company's critics, its customers' needs, and legal restrictions (Detienne & Lewis, 2005). It is important to note differences in firm size and environmental disclosure practices. Wirth *et al.* (2016) for example find that large firms tend to focus on reporting long term policies, whereas SME's tend to be more concerned about solving ad-hoc issues. Research on environmental disclosure is predominantly set in large firms relying on stock market data (Lo, 2010). Often previous research refers to publicly available annual reports or environmental reports using content analysis to develop disclosure scores (Al-

Tuwaijri et al., 2004; Brammer & Pavelin, 2008; Clarkson et al., 2008; Wirth et al., 2016; Helfaya & Moussa, 2017). Unfortunately, such information is not often available for SME's. This is due to a number of reasons, the main one being that it is not mandatory for wineries to publish this information. Also, and maybe more importantly, many Australian wineries choose not to disclose their environmental sustainability efforts as they are afraid it might harm their brand due to misconception about organic wine quality (Kroger, 2016). The fact that some wineries choose not to disclose their environmental sustainability efforts makes it hard for the consumer to differentiate them from those firms that do not behave in an environmentally friendly manner at all, which often results in lack of trust. Doane (2000) outlines the problem of trust when it comes to environmental reporting. It is highlighted that although organisations raise levels of disclosure of their social, ethical and environmental performance, there is a lack of confidence among stakeholders in both the data reported and the sincerity of the reporting organisations.

Thus, neither external stakeholders nor internal business units will benefit from such reporting if there is a lack of confidence in its validity (Dando & Swift, 2003). It is therefore questioned whether reporting alone can establish trust between an organisation's environmental behaviour and the stakeholders involved. One way to overcome the barrier of a lack of trust is for businesses to assure their stakeholders of their environmental sincerity through independent third parties (Dando & Swift, 2003). Such third party certification is often applied in the wine industry where environmental business behaviour is disclosed in the form of displaying sustainable, organic, or biodynamic certificates.

The certification landscape in the Australian wine industry is diversified with examples of such certificates being 'Australian Certified Organic', 'ISO14001' and 'Entvine Australia'. Research shows that roughly 30% of Australian wineries have some form of environmental certification (Kroger, 2016). But even when such official certification is missing wineries still report, using various communication tools, how their business is adhering to environmental principles, (Cordano *et al.*, 2010). Furthermore, it has been identified that disclosing such information has a positive effect on the image of firms, and it is suggested that the disclosure of environmental information results in customer trust (Amran *et al.*, 2015). Despite these advantages, gaining official certification is expensive in terms of time and monetary resources (Synergy, 2000). Indeed, current literature on CSR questions whether such environmental disclosure is 'worth it' – and whether there are 'good reasons' to invest in

CSR and the disclosure thereof (Hanke & Stark, 2009, Clarkson *et al.*, 2011; Fujii *et al.*, 2013).

### *Business Performance as an Indicator of Environmental Disclosure*

Although measuring the relationship between environmental disclosure, environmental behaviour and performance is by no means a new avenue for research (Freedman & Jaggi, 1982; Richardson & Welker, 2001; Ullmann, 1985), understanding is limited as to the nature of the relationship between these three constructs. Ullmann (1985) for example, criticises the lack of understanding of the relationship between social performance, social disclosure and economic performance, and blames the absence of theoretical underpinning and unclear terminology for inconclusive results. Others reveal insignificant results when testing the relationship between these variables (Freedman & Jaggi, 1982; Ingram & Frazier, 1980; Wiseman, 1982), whilst more recent research suggests a negative association between social disclosure and firm performance (Richardson & Welker, 2001). Interestingly, firm performance measured in form of Return on Investment (ROI) did not show a significant influence on environmental disclosure. This is similar to the findings of Ahmad *et al.* (2003) who identified the disclosure of environmental information as being negatively related to firms' financial leverage. Cormier *et al.* (2005) also concluded that firm performance does not seem to be a statistically significant determinant of environmental disclosure. Furthermore, D'Amico *et al.* (2016) predicted that environmental disclosure would increase with the profit a business makes and would decrease with increased levels of debt. Yet, and maybe surprisingly, it was found from a study of Italian firms that, especially in times of crisis and high debt accumulation, businesses tend to disclose environmental information to inform stakeholders about their environmental work (D'Amico *et al.* , 2016).

Al-Tuwaijri *et al.* (2004) hypothesised similar relationships but contrarily found that good environmental performance results in good economic profitability. Also, it was established that strong environmental performers would be more willing to disclose information about their pro-environmental behaviour. Weber (2014) finds an interesting relationship in that firms that disclose more environmental information show a positive effect on both environmental and financial performance. Further research reviews other strategic capabilities as antecedents to environmental disclosure and concludes that firms' profitability, product diversification and brand name do indeed affect online environmental disclosure

(Amran *et al.*, 2015). Thus, this research suggests positive relationships between the unique resources in the wine industry and environmental disclosure.

- Hypothesis 2 (H2)**      **Business performance is positively associated with *environmental disclosure*.**
- Hypothesis 2a (H2a)      Brand performance is positively associated with *environmental disclosure*.
- Hypothesis 2b (H2b)      Service performance is positively associated with *environmental disclosure*.
- Hypothesis 2c (H2c)      Financial performance is positively associated with *environmental disclosure*.
- Hypothesis 2d (H2d)      Innovation performance is positively associated with *environmental disclosure*.

### *The Moderating Effect of Environmental Attitudes and Norms*

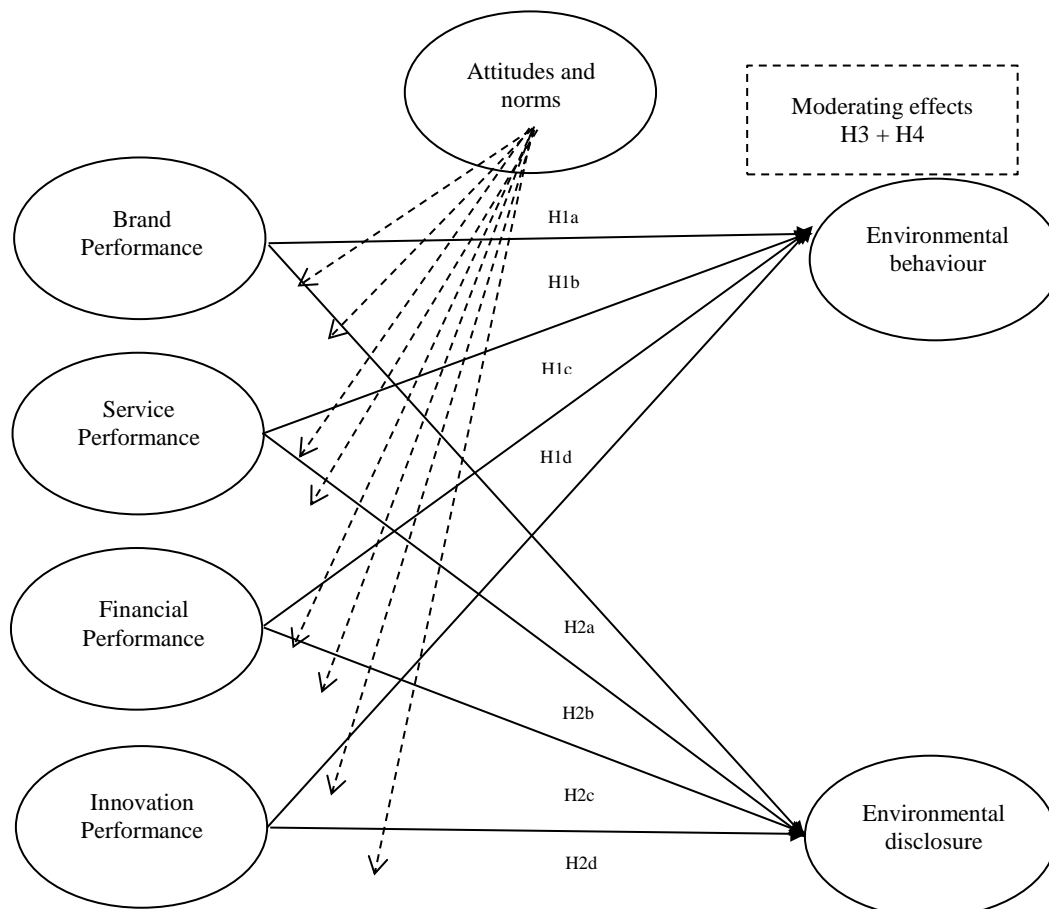
Environmental decision making and the environmental judgement of managers are widely discussed areas when it comes to implementing environmental behaviour and disclosure (Ferrell *et al.*, 2007; Sparks & Pan, 2010). Both Ullmann (1985) and Al-Tuwaijri *et al.* (2004) stress that a firm's management jointly determines the relationship between economic performance, environmental performance, and environmental disclosure, particularly in SMEs where decisions are often based on the attitudes and norms of owner-managers (Rothenberg & Becker, 2004). The fact that the environmental decision making process in SME's is highly influenced by management attitudes and norms can be explained by the norm-activation theory of altruism (Schwartz, 1977, Stern *et al.*, 1999). This theory holds that pro-environmental actions are executed in response to personal moral norms about such actions, which is important when it comes to the management's influence on environmental behaviour as well as environmental disclosure. Gabzdylova *et al.* (2009) examined norms and values regarding environmental behaviour in the wine industry and compared individual and institutional drivers. It was found that individual drivers such as environmental values and personal satisfaction had the strongest influence on sustainable practices among New Zealand wineries. Another stream of research investigates managerial attitudes and norms as drivers of proactive environmental behaviour in the US wine industry, and similar results are found with attitudes and norms being identified as stronger drivers than the community pressure of consumer demand (Marshall *et al.*, 2005). Furthermore, Cordano *et al.* (2010) highlight the importance of organisational structures in the wine industry as they are often quite simple, with the owner-manager being at the head of a small workforce. Thus, it is suggested that managers' attitudes towards the environment are likely to strongly influence decision making. The following additional hypotheses are therefore proposed:

**Hypothesis 3 (H3)** Management attitudes and norms moderate the relationship between business performance and *environmental behaviour*.

**Hypothesis 4 (H4)** Management attitudes and norms moderate the relationship between business performance and *environmental disclosure*.

### *Research Framework*

The main purpose of this study is to explore the positive effect of different firm resources on environmental behaviour and disclosure in the Australian wine industry. It further explores the moderating role of management attitudes and norms in influencing the relationship between firm resources and environmental behaviour as well as disclosure. Firm resources are measured as business performance in the form of four different competitive resources: brand performance, service performance, financial performance, and innovation performance. The research framework and hypotheses are illustrated in Fig. 1.



**Fig. 1** Research Framework and Hypotheses

## **Research Design and Methods**

### *Sample and Data Collection*

This research focuses on SME wineries operating cellar door sales outlets located across all the wine regions of Australia. The concentration of the study in one particular industry is advantageous as it prevents industry variation that needs to be controlled for (see for example in Helfaya & Moussa, 2017). The classification of SMEs in Australia requires that a business employs fewer than 200 employees (ABS, 2004) which led to 1,711 separate businesses forming the sample frame for the research. Wineries and their owner/managers were identified using a database published by Winetitles Pty Ltd (The Australian and New Zealand Wine Industry Directory 2014). Following an adaptation of Dillman's (2007) mail survey approach, respondents received the questionnaire with a pre-paid return envelope. Two weeks after sending the initial questionnaire a reminder letter was sent, with follow-up telephone calls then being undertaken to raise the valid response rate.

The survey instrument is divided into four parts: 1) the measurement of environmental behaviour in the form of sustainability practices among wineries, and management environmental attitudes and norms; 2) environmental disclosure; 3) business performance measures; and 4) characteristics of the responding wine businesses. Prior to sending out the survey five researchers reviewed the questionnaire with regards to structure, content and wording. Following this it was pilot tested with three winery owner-managers who reviewed it concerning ambiguities in terms, meanings and other potential issues. After the different stages of survey administration a total of 220 usable questionnaires were obtained. The response rate of 14% is acceptable for management respondents in small and medium sized enterprises, and is consistent with previous studies of this type (Dennis Jr., 2003).

Since full measurement of the population cannot be achieved, consideration of non-response bias is required (Groves, 2006). The extrapolation method was applied which studies the variation within the existing survey based on a comparison of the first wave and later respondents (Atuahene-Gima & Ko, 2001; Sinha & Akoorie, 2010). The majority of the key variables show a significance value greater than 0.05, and therefore indicate that both groups (early and late respondents) share the same variance. Secondly, the t-tests assuming equality of means for the main study variables are all above the 0.05 significance threshold which

implies that there are no differences between the two groups of early and late respondents. Evidence therefore suggests that problems with non-response bias, or the respondents not being a representative sample, are not present in the study (Armstrong & Overton, 1977).

Further to this, as the same respondents completed the survey questions that related to both the independent and dependent variables, there is potential for concern with regards to common method variance (Podsakoff *et al.*, 2003). In order to establish whether this was present Harman's single factor test using exploratory factor analysis has been applied where all items were loaded on a single factor. The first factor accounted for 26.96% of the variance, which is less than the majority (< 50%), hence indicating that there is an absence of common method bias in the data (Karatepe, 2010).

Table 1 presents the descriptive statistics of the 220 firms studied. The sample characteristics of the wineries in this research are analysed in terms of number of employees, wine cases sold per year, vineyard size in hectares (ha) and ownership style as outlined below.

**Table 1:** Sample Descriptive Characteristics

Number of employees	Frequency	Percent	Cases sold per year	Frequency	Percent
< 5	125	63.1%	< 100	5	2.7%
5 - 9	33	16.6%	100 – 999	45	23.9%
10 – 19	24	12.1%	1,000 – 9,999	95	50.5%
20 – 49	9	4.5%	10,000 – 99,999	35	18.6%
50 – 99	4	2.0%	100,000 – 1 Mio	5	2.7%
Over 100	3	1.5%	> 1 Mio	3	1.6%
Vineyard size in ha	Frequency	Percent	Ownership	Frequency	Percent
< 5	67	34.2%	Sole proprietorship	39	19.7%
5 - 9	37	18.9%	Partnership	53	26.8%
10 – 19	33	16.8%	Family ownership	99	50.0%
20 – 49	33	16.8%	Other	7	3.5%
50 – 99	11	5.6%			
Over 100	15	7.7%			

Based on this profile the sample for this study can be summarized as mainly small to very small, mainly family owned wineries which is representative of the Australian SME wine industry (Cambourne & Macionis, 2000).

### *Measurements of Constructs*

The questionnaire predominantly comprised pre-existing measurement scales, with others being adapted from pre-existing scales or being developed specifically for the study where scales were not available, or appropriate to the wine industry setting. The measurement scales with their constituent items and sources are presented in Appendix 1.

### *Environmental Behaviour*

Environmental behaviour is measured on a second order scale based on the work of Pullman *et al.* (2010), relating to recycling practices, environmental behaviour, and environmental management practices. The measurement of environmental behaviour includes sixteen items in total. Examples from all four variables include ‘At our winery we recycle waste materials from wine making’; ‘At our winery we use herbicides/pesticides that are environmentally friendly’; and ‘At our winery we monitor our environmental impact. Each item was measured on a five-point Likert type rating scales from 1-5 (strongly disagree to strongly agree).

### *Management Attitudes and Norms*

Environmental attitudes and norms are measured based on a second order scale for sustainability attitudes developed by Cordano *et al.* (2010) who researched how SMEs go ‘green’. The existing scale fulfils satisfying reliability and validity measures and has been applied in the wine industry context which justifies their use in this particular research. The scale contains seven items including ‘At our winery people feel a personal obligation to do whatever they can to minimize environmental harm’ and ‘At our winery people feel a personal obligation to exceed the requirement of sustainability regulations’. All items were measured using a five-point rating scale from 1 (strongly disagree) to 5 (strongly agree).

### *Environmental Disclosure*

As extant measures are not applicable in the context of the wine industry a new scale, based on green advertising literature (Banerjee *et al.*, 1995), was developed for disclosing environmental behaviour. In total four items measured using a five-point scale from 1 to 5 (strongly disagree to strongly agree) were used to evaluate environmental disclosure.



Examples of the items include ‘Our wine brands are linked to an environmental cause’ and ‘Our wine brands address the relationship between the environment and our wine’.

### Business Performance

The measurement of winery’s resources is based on business performance measures, as properly managed resources function as key firm performance indicators. There are a number of resources in the wine industry that are perceived as essential to well-performing wine businesses. Winery owners were asked to assess their winery performance in comparison to wineries of similar size over the past five years with regards to possessing certain resources. Five-point Likert scales ranging from 1 (being among the worst 20%) to 5 (being among the best 20%) of comparable wineries measured firm performance. The Australian wine industry is comprised of SME’s that are not required to publish annual reports, thus making objective performance measures harder to attain. It has been established that if objective performance measurements are unavailable, this format of collecting performance information, relative to similar companies in the industry, is likely to produce findings that are consistent with factual measures (Dess & Robinson, 1984).

Brand performance comprises seven items linking to existing brand resources including ‘Creating successful wine brands’ and ‘Brand equity (awareness and positive association) of this winery’ (Chen, 2010). Service performance refers to the ability of wineries to attract visitation and includes eight items: ‘Attracting high income visitors to the winery’ being one of those (Dwyer & Kim, 2003). Financial performance includes eleven items with general financial performance measures, ‘Overall profitability of this winery’ being one example (Rao & Holt, 2005). Finally, innovation performance comprises four items including ‘innovativeness of this winery’ (Gatignon & Xuereb, 1997).

### **Analysis and Results**

This research employs partial least squares structural equation modelling (PLS-SEM) using WarpPLS 5.0 software to undertake the analysis. Partial least squares represents a variance-based technique of SEM and is applied to estimate models with complex, multivariate relationships between latent variables (Henseler *et al.*, 2009). Using this technique, rather than covariance-based SEM, has the advantage of robustness of estimations and statistical power when used with small sample sizes. Additionally, as is the case with this study, it is

identified as being particularly appropriate in the early stages of theory development (Hulland, 1999; Hair *et al.*, 2011).

### *Measurement Model*

The means, standard deviations and correlations among the constructs are presented in Table 2. There are positive correlations among the seven constructs: environmental disclosure, attitudes and norms, environmental behaviour, and brand, service, financial and innovation performance.

**Table 2:** Means, Standard Deviations, and Correlations of the Constructs

Constructs	Mean	Standard deviation	(A)	(B)	(C)	(D)	(E)	(F)
(A) Environmental disclosure	2.951	0.963						
(B) Attitudes and norms	3.338	0.697	0.661**					
(C) Environmental behaviour	3.616	0.703	0.579**	0.647**				
(D) Brand performance	3.734	0.827	0.275**	0.308**	0.375**			
(E) Service performance	2.655	0.917	0.190	0.220	0.264**	0.437**		
(F) Financial performance	3.008	0.851	0.106	0.201	0.242**	0.480**	0.401**	
(G) Innovation performance	3.260	0.881	0.305**	0.422**	0.452**	0.494**	0.341**	0.489**

\*\*  $p < 0.01$

There are a number of different measures to confirm the reliability and validity of the measurement model. One such way of measuring the internal consistency reliability is to review the loadings of each of the construct individual items. Items with loadings of 0.7 and higher are generally acceptable as they show that the variance shared between the constructs is more than error variance (Hulland, 1999). Regarding the quality of the measurement model, the loadings ( $\lambda$ ) of items of the constructs listed in Table 3 are all significant and above 0.7. The construct's internal reliability can be measured with Cronbach's alpha ( $\alpha$ ) which provides an estimate of the reliability based on the inter-correlations of the observed indicator variables (Hair *et al.*, 2014). The measures in this study all achieve  $\alpha$  scores above

the minimum acceptable threshold of 0.7 (Hair *et al.*, 2011). Composite reliability (CR) for all the measures also exceeds the recommended threshold of 0.7 (Hair *et al.*, 2014).

**Table 3:** Item Loadings ( $\lambda$ ), Cronbach's  $\alpha$ , CR, and AVE

Constructs	Items	$\lambda$	CR	$\alpha$	AVE	AVE <sup>2</sup>
Environmental disclosure	IBRA_S1	0.851**	0.904	0.859	0.703	0.838
	IBRA_S2	0.801**				
	IBRA_S3	0.858**				
	IBRA_S4	0.843**				
Attitudes and norms	IV_BEN	0.884**	0.877	0.719	0.781	0.884
	IV_NOR	0.884**				
Environmental behaviour	IV_PRAMNG	0.859**	0.824	0.711	0.547	0.740
	IV_PRAENV	0.620**				
	IV_PRAREC	0.851**				
	IV_PRASOC	0.586**				
Brand performance	PER_BRA1	0.861**	0.893	0.820	0.736	0.858
	PER_BRA2	0.859**				
	PER_BRA3	0.853				
Service performance	PER_SER1	0.784**	0.920	0.895	0.659	0.812
	PER_SER2	0.828**				
	PER_SER3	0.869**				
	PER_SER4	0.861**				
	PER_SER5	0.813**				
	PER_SER6	0.703**				
Financial performance	PER_FIN1	0.887**	0.922	0.898	0.665	0.815
	PER_FIN2	0.869**				
	PER_FIN3	0.738**				
	PER_FIN4	0.841**				
	PER_FIN5	0.806**				
	PER_FIN6	0.740**				
Innovation performance	PER_INN1	0.865**	0.905	0.859	0.705	0.839
	PER_INN2	0.897**				
	PER_INN3	0.840**				
	PER_INN4	0.749**				

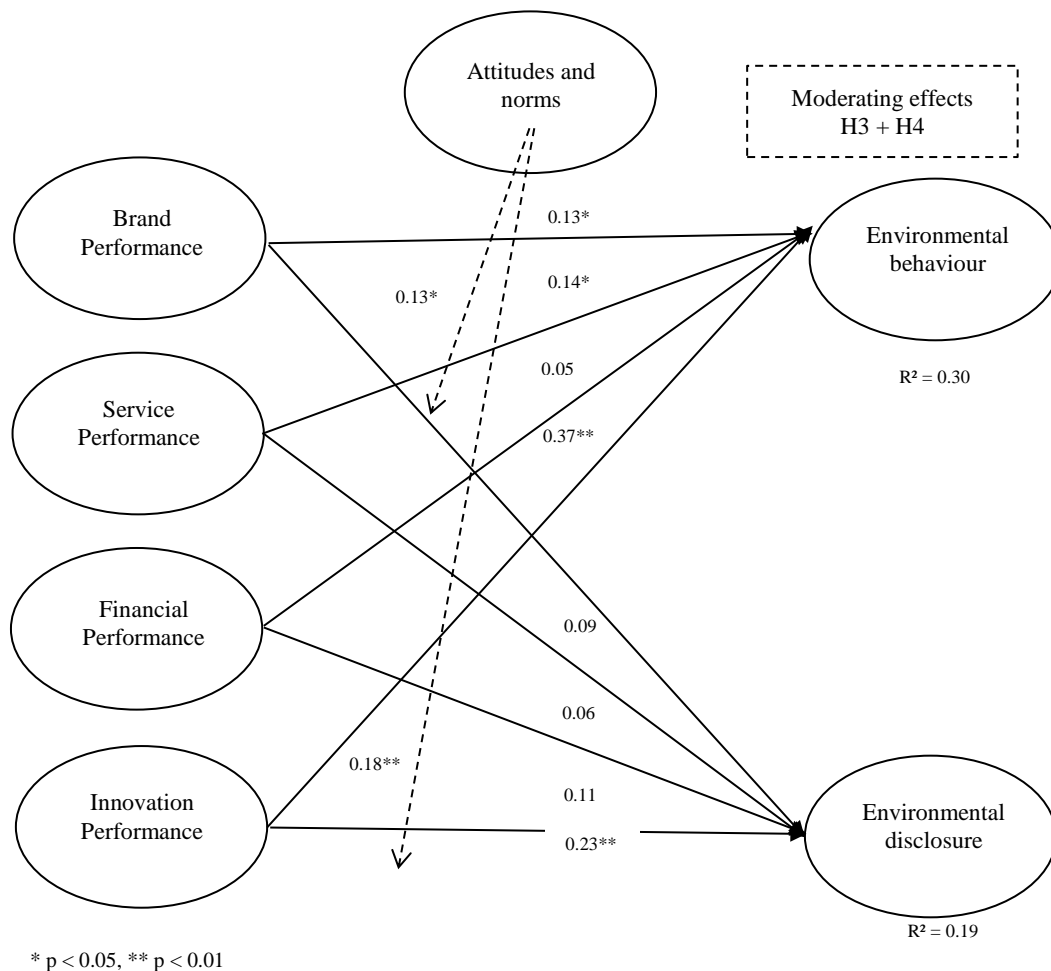
\*\*  $p < 0.01$

Convergent and discriminant validity were also evaluated. For convergent validity the average variance extracted (AVE) is suggested to be higher than 0.50 (Hair *et al.*, 2011) with the latent construct therefore explaining more than 50% of the indicator's variance. All the AVE's in Table 3 show satisfactory convergent validity ( $> 0.5$ ). Discriminant validity is tested using the Fornell-Larcker criterion which requires that the AVE of each latent construct should be higher than the construct's highest squared correlation with any other latent construct (Fornell-Larcker, 1981). The square roots of the constructs' AVEs in Table 3

exceed the correlations for all constructs in Table 2, therefore indicating acceptable discriminant validity.

### *Structural Model and Hypothesis Tests*

The results for the structural model and hypothesis tests are outlined in Figure 2 and Table 4. The full structural model includes both the proposed direct effects between the four performance measures, and environmental behaviour and environmental disclosure. It also proposes moderation of these effects by managerial attitudes and norms. Moderation exists where an additional construct directly affects the relationship between the exogenous and the endogenous latent variable, and changes the strength or direction of a relationship between two original constructs in the model (Hair, 2014). Establishing a moderation effect is achieved by testing the moderating link's strength through the calculation of a path coefficient and determining its statistical significance through the calculation of a p-value (Kock, 2015).



**Fig. 2:** Path Coefficients

**Table 4:** Structural Model and Hypothesis Tests

Hypothesis	Proposed Effect	Path Coefficient	Results
H1	+		H1 partially supported
H1a	+	0.13*	H1a supported
H1b	+	0.14*	H1b supported
H1c	+	0.05	H1c not supported
H1d	+	0.37**	H1d supported
H2	+		H2 partially supported
H2a	+	0.09	H2a not supported
H2b	+	0.06	H2b not supported
H2c	+	0.11	H2c not supported
H2d	+	0.23**	H2d supported
H3	+		H3 partially supported
H4	+		H4 partially supported

\*  $p < 0.05$ , \*\*  $p < 0.01$

Model fit and quality indices are assessed in PLS-SEM using the average path coefficient (APC), average  $R^2$  (ARS) and average variance inflation factor (AVIF). The measures of the overall fit indicate an acceptable fit of the structural model (APC=0.133, ARS=0.245, AVIF=1.300). They suggest a good fit of the data to the model with statistically significant APC and ARS (Hair *et al.*, 2014); and low overall collinearity, AVF < 4 (O'Brien, 2007). Additionally, the coefficient of determination ( $R^2$  value) is most commonly used as a measure of the model's predictive accuracy indicating the percentage of explained variance in connection with each of the endogenous latent variables in the model. This study shows a satisfactory predictive accuracy with  $R^2 = 0.30$  for environmental behaviour and  $R^2 = 0.19$  for environmental disclosure (Hair *et al.*, 2014). The model's explanatory power can be further conveyed by the the Tenenhaus Goodness-of-Fit (Kock, 2015) which at 0.39 can be classified as large, being in excess of the 0.36 threshold proposed by Wetzels and Odekerken-Schröder (2009).

Following the PLS-SEM analysis, estimates can be made for the structural model relationships which embody the hypothesized relationships among the constructs. There is partial support for Hypothesis 1 as some, but not all, of the aspects of overall performance are related directly with environmental behaviour. This study verifies that brand performance is significantly and positively associated with environmental behaviour ( $\beta=0.13$ ,  $p<0.05$ ), as are service performance ( $\beta=0.14$ ,  $p<0.05$ ) and innovation performance ( $\beta=0.37$ ,  $p<0.01$ ). Thus Hypotheses 1a, 1b and 1d are supported. However the positive relationship between financial performance and environmental behaviour, Hypothesis 1c, is not supported. The proposed

positive relationship between business performance and environmental disclosure, Hypothesis 2, is partially supported, but in a very limited way. Only innovation performance ( $\beta=0.23$ ,  $p<0.01$ ) is positively, and significantly, related to environmental disclosure, therefore supporting Hypothesis 2d. None of the other performance measures are significantly associated with environmental disclosure, so Hypotheses 2a, 2b and 2c are all rejected.

This results indicate a moderating effect for a number of relationships but a moderating effect can only be verified if the direct relationship between the two constructs in the model is also significant (Kock, 2015). On this basis only two moderation effects could be established and thus only partial and limited support was evident for Hypotheses 3 and 4. The significant effect between service performance and environmental behaviour is positively moderated by managers' environmental attitudes and norms ( $\beta=0.13$ ,  $p<0.05$ ). Furthermore, the strong, significant relationship between innovation performance and environmental disclosure is positively moderated by the attitudes and norms of managers ( $\beta=0.18$ ,  $p<0.01$ ).

## **Discussion**

Our results provide some interesting empirical and theoretical insights into the suggested relationships. Significant positive effects were identified for owning strong brands together with having strong service resources, and environmental behaviour in SME wineries. This means that SME wine businesses that perform strongly in terms of their branding, and succeed in attracting visitation through tourism service facilities, are more likely to implement environmental behaviour. Moreover, a highly significant relationship between the resources of being innovative and environmental behaviour was identified. Performing at a high level of innovativeness therefore appears to be an important factor in influencing environmental behaviour among wineries.

Interestingly, the financial strength of a winery is not significantly related to environmental behaviour which is contrary to previous findings in regard to its advantages in market development and international expansion (Westhead *et al.*, 2001; Pellicanò & De Luca, 2016). It is also contrary to the sustainability entrepreneurship literature that emphasises profit as one of the three pillars of sustainable entrepreneurship 'leading the firm in making balanced choices between profit, people and planet' (Masurel, 2007, p. 191). However, there

is another stream of research stressing that profit maximization is not the central objective of most SME's, arguing that profit alone is not evidence of successful SME's (Avickson, 2017). Additionally, Ciemleja & Lace (2011) agree that for many SME owners/managers adding value in form of identifying future opportunities, risks and uncertainties is more relevant than maximizing profits.

Receiving investments in the form of bank loans also does not always depend upon SMEs' future profit streams, but instead researchers find that soft information determines loan availability for SME's (Shen et al., 2009). Additionally, Hay & Kamshad (1994) look into SME's managers/owners' desire for growth and the associated investment need for profit. They found that the majority of the sampled SME's regard the increased administrative burden arising from expansion as too demanding on them to pursue a growth strategy. Specifically, they divide reasons hindering expansion into internal and external factors. Raised intensity of competition has been identified as an external factor stopping SME's from wanting to grow (Hay & Kamshad, 1994). Furthermore, and maybe even more pertinent, they identified that internal factors such as wanting to remain small for manageability reasons, reluctance to dilute ownership, and unwillingness to take on new debt were raised as concerns for SME managers/owners not wanting to grow. This lack of growth and profit maximization strategy among SME's is important to note, as our findings indicate that financial resources are not crucial to implementing environmental strategies. This suggests that wine businesses should not rest on the understanding that acting positively toward the environment requires strong financial resources. In light of the literature that establishes SME's reluctance to grow, our findings show that environmental behaviour is feasible without profits and a growth strategy. Rather, innovativeness, developing a strong tourism and retail service infrastructure, and building meaningful brands can be advantageous to implement environmental behaviour in SME wineries. There seems to be a prevailing belief amongst wine businesses generally that acting in an environmentally friendly manner by offering sustainable, organic or biodynamic wine is counterproductive and reserved for financially-rich wineries (Gemrich & Arnold, 2007). Yet, this suggests that a high level of financial performance is not a key antecedent of environmental behaviour, and that it is other key resources that affect levels of environmental behaviour.

The empirical results also demonstrate that being innovative is the only factor that is significantly and positively associated with environmental disclosure. Thus, SME wine

businesses that are seen as strong in their innovation resources are more likely to disclose their environmental behaviour to their stakeholders. This might be in form of certification or general marketing communication, and indicates that wineries that possess highly innovative resources are likely to disclose their environmental behaviour. The finding that financial performance has not been identified as a significant factor of influence over environmental disclosure supports other studies (Ahmad *et al.*, 2003; Cormier *et al.*, 2005; D'Amico *et al.*, 2016) that did not establish financial performance as affecting environmental information dissemination.

Contrary to established research (Amran *et al.*, 2015), this study did not find support for the understanding that owning strong brands influences environmental disclosure. However the Amran *et al.* (2015) study reviewed only online environmental disclosure which might explain the identified positive relationship. Our finding that SME wineries which perform strongly in relation to brand, service and innovation resources positively affect environmental behaviour is in line with the previous study of Al-Tuwaijri *et al.* (2004). Our findings develop this further through specifically highlighting the significance of innovation to both behaving positively towards the environment, and engaging in environmental disclosure. Aragón-Correa & Sharma (2003) propose a contingent view of the RBV and argue that organisations need to identify the resources that generate proactive environmental strategies, suggesting that a firm's resources are drivers of an environmental strategy. They request an examination of the specific resources and capabilities that are crucial for generating such proactive environmental strategies. The research presented here responds to this by demonstrating how brand, service and innovativeness resources are essential for implementing environmental sustainability behaviour in SMEs in the wine industry. It is interesting to note that neither owning strong wine brands, nor financial resources, or the ability to attract visitors has an effect on disclosing information about environmental sustainability efforts. This may suggest that whilst environmental behaviour is influenced by firm's resources, there are other factors that affect whether firms choose to disclose such environmental behaviour.\

Whereas early studies emphasise the external business environment as crucial in testing the relationship between firm resources and environmental behaviour (Aragón-Correa & Sharma, 2003; Sharma & Vredenburg, 1998), this study takes an endogenous approach by looking at firms' internal managerial attitudes and norms as moderator of the relationship. Past literature finds managerial skills and attitudes as important resources in the development of



environmental behaviour (Cordano & Frieze, 2000). Yet, this research suggests that such positive attitudes and norms actually strengthen the relationship between a firm's resources and environmental behaviour as well as environmental disclosure. With this, the moderating role of positive management attitudes towards environmental behaviour supports the postulation that environmental practices and disclosure are both influenced by the quality of management (Porter & v.d. Linde, 1995). This holds particularly true for the wine industry which is characterised by SMEs, as in these organisations decisions are made based on the owner/manager's attitudes and norms (Rothenberg & Becker, 2004). The positive moderating effect of norms and attitudes held by the wineries' management in the relationship between firms' resources and environmental behaviour, as well as environmental disclosure, is consistent with a number of studies. For example Al-Tuwaijri *et al.* (2004) stress how economic and environmental performance depends on how the management of the firms perceives its importance. This is in agreement with other studies set in the wine industry which measure attitudes and norms as drivers for environmental behaviour (Gabzdylova *et al.*, 2009; Marshall *et al.*, 2005; Cordano *et al.*, 2010).

Theoretically, this paper makes an important contribution in examining the relationship between a firm's resources and environmental behaviour and disclosure by recognizing a firms' resources as contributors to pro-environmental activities. The literature is well established, if inconclusive, in testing whether businesses taking part and communicating environmental behaviour perform better in terms of gaining more financial resources than businesses that might not be inclined to behave in a pro-environmental way. Yet, understanding of whether owning such resources is actually a prerequisite of firms behaving in an environmentally friendly manner is limited. Thus our findings support the RBV view of the firm by illustrating how firms with more resources are able to behave positively towards the environment. Additionally, whilst a number of recent studies have investigated the precursors of disclosing environmental behaviour, these have resulted in uncertain results. This research provides some clarity in respect to this through identifying that financial resources are not necessary to disclose environmental information, with innovativeness instead being established as a key resource. Furthermore, the norm-activation theory of altruism can be supported in that managers that have strong environmental attitudes and norms will be more likely to support environmental behaviour and its disclosure, thus increasing the effects of specific resources upon them. Moreover, the multi-dimensional measurement of resources adds to extant research by showing how financial resources are

only one aspect of the environmental implementation discussion, particularly as it is not directly associated with either environmental behaviour or disclosure in the context of this study. Thus, this paper opens up the debate on the nature of which resources influence environmental behaviour and disclosure. In particular it questions the assertion that environmental strategies are limited to high financial performing firms, and indeed suggests that it can be considered by any business capable of utilising appropriate resources to lever the benefits of an environmental positioning such as the SME wineries considered here.

Practically, this research contributes to the understanding of resource necessity for acting environmentally and its disclosure. Our findings suggest that management should change their strategic outlook regarding environmental behaviour and environmental disclosure. Instead of focusing on the financial costs of implementing such behaviour and disclosure, businesses should look at the opportunities afforded by environmental strategies through exploiting their non-financial resources. Furthermore, they indicate that instead of imitable resources such as finance, inimitable and non-substitutable resources such as being highly innovative and having strong brands, are much more important in enacting and disclosing an environmental position. Additionally, policy makers in the wine industry who are interested in environmental solutions should be aware of the important role that the attitude and norms of management play in reinforcing the impact of these resources on environmental strategies. Therefore, measures can be taken to further foster positive attitudes and norms among owners/managers through organizing information events that stress how environmental behaviour and disclosure can be undertaken through capitalising on specific resources, and the positive benefits that may ensue.

### **Limitations and Further Research**

Despite the valuable findings, a number of limitations of this study need to be highlighted. The data used in the study were collected across a sample of Australian SME winery owner-managers which leads to a number of shortcomings. Whilst there are strong arguments for research on environmental behaviour and disclosure being measured in a SME setting, this also has its shortcomings. The study was limited to one representative of wineries subjectively judging the firm's performance in terms of possessing resources, environmental disclosure and environmental behaviour. In future, the relationship between business performance and environmental behaviour and disclosure in the SME context could be tested

based on objective measures by, for example, asking more than one respondent per business. Also it would be possible to triangulate current findings with other corporate communication media such as conducting a web content analysis of the individual businesses (similar to Wirth et al., 2016). Furthermore, this study used firm resources as a measure of performance. Whilst this has been argued as acceptable, the link between owning resources and thus being a strongly performing firm might require further investigation. Future studies could therefore, directly measure resource availability and test how this may influence environmental behaviour and disclosure. Given that the survey was undertaken at a specific point in time its cross-sectional nature does not enable causal relationships to be established. Opportunities therefore exist in future for longitudinal investigation of the same relationships. The context of the study within the Australian wine industry limits the generalizability of the findings, as does the focus upon SME wine producers. Further studies might want to select other countries as the setting and make comparisons with this research in relation to SMEs. They may also consider the applicability of the results in a broader set of organisations that can potentially benefit from further understanding of the relationships between firm resources and environmental positioning. This could take account of firm size and involve larger businesses, and different industries, to see whether the established significance between different aspects of performance and environmental behaviour and disclosure applies.

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## List of Abbreviations

<b>Abbreviations</b>	<b>Full term</b>
$\alpha$	Alpha
APC	Average Path Coefficient
ARS	Average R-squared
AVE	Average Variance Extracted
AVIF	Average Variance Inflation Factor
$\beta$	Beta
CR	Composite Reliability
H	Hypothesis
ha	Hectares
IBRA	Environmental disclosure
IV_PRA	Environmental behaviour
IV_BEN/NOR	Attitudes and Norms
p	P-value
PER	Performance
PER_SER	Service performance
PER_FIN	Financial performance
PER_BRA	Brand performance
PER_INN	Innovation performance
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares Structural Equation Modelling
RBV	Resource-based view
SCA	Sustainable competitive advantage
SEM	Structural Equation Modelling
SME	Small and Medium Size Enterprise
Std. Dev	Standard Deviation
VAF	Variance Accounted For
VIF	Variance Inflation Factor

## Appendix1: Measurement Scales, Items and Sources

CODE	VARIABLE	
<b>FIRST-ORDER SCALES</b>		
<b>Ethical disclosure</b>		
IBRA_S1	Our wine branding strategy stresses the benefits of sustainability.	(Banerjee, Gulas, & Iyer, 1995); (Chen, 2010)
IBRA_S2	Our wine brands address the relationship between the environment and our wine.	
IBRA_S3	Our wine brands are linked to an environmental cause.	
IBRA_S4	Our wine brands are well established for environmental concern.	
<b>SECOND-ORDER SCALES</b>		
<b>Ethical behaviour</b>		
PRA_SOC1	At our winery we ensure worker job satisfaction.	(Pullman, Maloni, & Dillard, 2010)
PRA_SOC2	At our winery we pay fair compensation (living wage) to all employees	
PRA_RECY1	At our winery we recycle waste materials from wine making.	(Pullman, Maloni, & Dillard, 2010)
PRA_RECY2	Our winery uses renewable energy sources.	
PRA_RECY3	At our winery we treat the farm as one cohesive, interconnected living system.	
PRA_ENV1	At our winery we use herbicides/pesticides that are environmentally friendly.	(Pullman, Maloni, & Dillard, 2010)
PRA_ENV2	Our winery uses fertilizers that are environmentally safe.	
PRA_ENV3	Our winery does not use artificial preservatives.	
PRA_ENV4	At our winery we farm grapes organically.	
PRA_ENV5	At our winery we have implemented wildlife habitat protection practices.	
PRA_ENV6	Our winery implements measures to preserve water.	
PRA_MNG1	At our winery we monitor our environmental impact.	(Pullman, Maloni, & Dillard, 2010)
PRA_MNG2	Our winery aims for ecological self-sufficiency.	
PRA_MNG3	At our winery we measure our carbon footprint.	
PRA_MNG4	Our winery provides funds for projects intended to improve environmental performance.	
PRA_MNG5	At our winery we employ ethical considerations.	
<b>Ethical norms and attitudes</b>		
ATT_BEN1	At our winery sustainable initiatives lead to enhanced reputation in the community.	(Cordano <i>et al.</i> , 2010)
ATT_BEN2	At our winery sustainable initiatives lead to cost savings.	
ATT_BEN3	At our winery sustainable initiatives lead to improved wine quality.	
ATT_BEN4	At our winery sustainable initiatives lead to increased customer demand.	
ATT_NOR1	At our winery people feel a personal obligation to exceed the requirements of sustainability regulations	(Cordano <i>et al.</i> , 2010)
ATT_NOR2	At our winery people feel a personal obligation to do whatever they can to minimize environmental harm.	
ATT_NOR3	At our winery sustainable initiatives are implemented completely voluntarily	
<b>Business performance</b>		
IPRF_TOU1	Growth of domestic visitors to this winery	Dwyer & Kim (2003)
IPRF_TOU2	Growth of visitors from Europe to this winery	
IPRF_TOU3	Attracting high income visitors to this winery	
IPRF_TOU4	Rate of revisit (visitor loyalty) to this winery	
IPRF_TOU5	Cellar door sales as percentage of total sales	
IPRF_TOU6	Expenditure of visitors at this winery	
IPRF_FIN1	Revenue growth of this winery	(Rao & Holt, 2005), (Podolny, 1999)
IPRF_FIN2	Sales growth of this winery	
IPRF_FIN3	Volume growth (litres)	

IPRF_FIN4	Overall profitability of this winery	
IPRF_FIN5	Margin growth of this winery	
IPRF_FIN6	Average wine retail price of wines from this winery	
IPRF_MAR1	Creating successful wine brands	(Blain, 2005)
IPRF_MAR2	Success of premium brands offered at this winery	
IPRF_MAR3	Brand equity (awareness and positive association) of this winery	
IPRF_INNO1	Successful new product introductions	(Deshpande, Farley, & Webster, 1993)
IPRF_INNO2	Innovativeness of this winery	
IPRF_INNO3	Responsiveness of this winery to consumer trends	