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A relational natural-resource-based view on product innovation: The influence of green product innovation and green suppliers on differentiation advantage in small manufacturing firms

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ABSTRACT

The resource-based view (RBV) of the firm has been used to examine the role of resources and capabilities in product innovation and how product innovation is related to overall firm performance. Moreover, the natural RBV (NRBV) has addressed how resources affect the natural environment, whereas the relational RBV has highlighted the importance of relational resources, that is, resources shared with stakeholders outside the focal firm. In order to consider these extensions of the RBV in product innovation, this article applies a relational NRBV (RNRBV) on product innovation. Using data from 305 Swedish small manufacturing firms, structural equation modeling is used to examine the relationships between green product innovation (GPI), differentiation advantage and firm performance, and how these relationships are influenced by a relational resource in terms of green suppliers. The results demonstrate that GPI affects differentiation advantage and that this relationship is strengthened by having green suppliers. The article offers a RNRBV on product innovation and illustrates the importance of incorporating additional dependent variables other than aggregated performance measures when researching GPI. Moreover, the study shows that green suppliers can provide important products and complementary resources in order for the focal firm to fully realize its GPI capability.

1. Introduction

The resource-based view (RBV) of the firm (Barney, 1991; Grant, 1991; Peteraf, 1993; Wernerfelt, 1984) has been widely applied in product innovation research (Henard and McFadyen, 2012; Kleinschmidt et al., 2007; Terziovski, 2010; Verona, 1999). From a RBV, successful product innovation can be attributed to a capability consisting of a bundle of resources controlled by the firm (Verona, 1999), and this ability to be innovative in product development will enable the firm to differentiate its products from those of its competitors (Barney, 1991) and ultimately achieve superior overall performance (Peteraf and Barney, 2003). Thus, the RBV can offer a strategic management approach to product innovation by addressing the relationship between product innovation capability and gaining a competitive advantage.

Whereas the RBV has a highly firm-centric approach, an important extension of the RBV, namely, the natural RBV (NRBV), considers the environmental impact of firms' resources and of the processes emanating from these resources (Hart, 1995; Hart and Dowell, 2010). Successful product innovation from a NRBV should both enable a firm to gain a competitive advantage and be beneficial for the natural environment. The research area of green product innovation (GPI) is receiving increased interest but, as illustrated in reviews on GPI and related concepts, this research has mainly concerned antecedents to GPI and not outcomes (De Medeiros et al., 2014). The studies that have addressed outcomes of GPI have mainly examined aggregated financial and economic firm-level outcomes (Dangelico, 2016) and produced mixed results (Lin et al., 2013). However, numerous different factors will influence overall firm performance, and the core notion of the RBV is that resources, such as the capability to excel in GPI, will enable the firm to implement a strategy (Barney, 1991) in order to differentiate its products from those of its competitors (Peteraf and Barney, 2003). As stated by Ray et al. (2004, p. 24), "simply examining the relationship between a firm's resources and capabilities and its overall performance can lead to misleading conclusions." This makes it more relevant to explore the relationship between resources and differentiation per se. Whereas GPI, by definition, will result in improved environmental performance, the relationship between GPI and differentiation advantage is a somewhat overlooked research area (Dangelico, 2016).

A limitation of the NRBV is that it was developed before the breakthrough of the relational RBV (Das and Teng, 2000; Dyer and Singh,

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1998). In contrast to the traditional RBV, the relational RBV acknowledges the importance of resources shared with other organizations (Dyer and Singh, 1998; Lavie, 2006). The importance of suppliers for product innovation is well established in the product innovation literature (Adomako et al., 2019; Lau et al., 2010; Potter and Lawson, 2013; Van Echtelt et al., 2008), and several studies have specifically highlighted the importance of green suppliers for GPI (Chiou et al., 2011; Lee and Kim, 2011; Melander, 2017; Pujari, 2006). This accentuates the importance of considering the role of suppliers when examining the relationship between GPI and differentiation advantage. Therefore, the aim of this study is to contribute to the development of a relational NRBV (RNRBV) on product innovation by examining the relationships between GPI, green suppliers and differentiation advantage. These relationships will be examined in a sample of 305 Swedish small manufacturing firms.

This study makes two main contributions. First, it is the first effort to develop a RNRBV on product innovation. The NRBV has been used in some literature on product innovation (Claudy et al., 2016; Lee and Min, 2015; Zhang and Walton, 2017). However, the NRBV approach used in the present paper is more grounded in the traditional RBV on how resources enable firms to implement strategies and it also considers the importance of relational resources. The results presented in this paper address some key variables to consider in the development of a RNRBV on product development, and the study can constitute a foundation for future research on GPI based on the RBV and extensions of the RBV. Second, a more specific contribution of the study is the focus on the relationship between GPI and differentiation advantage. Disaggregating the outcome of GPI provides a more detailed examination of the underlying mechanisms of how GPI can contribute to firm performance. From a RBV, superior firm performance can be explained by superior differentiation (or superior cost effectiveness), and this study examines how GPI is related to achieving such a strategy instead of examining a direct, but a possibly confounded, relationship between GPI and aggregated firm performance.

2. Theoretical framework

2.1. Theoretical background

The theoretical foundation of this paper is the RBV of the firm. The RBV addresses how firms' internal resources and capabilities are related to sustained competitive advantages (Barney, 1991; Peteraf, 1993; Ray et al., 2004) and is a key research domain in strategic management research (Andersén et al., 2016; Barney et al., 2011; Lockett et al., 2009). However, the RBV is restricted to explaining firm-level outcomes and does not consider the environmental impact of firms' activities. In response to this, Hart (1995) developed the NRBV of the firm. In contrast to the RBV, the NRBV respects the constraints of the natural environment and can be seen as "a theory of competitive advantage based upon the firm's relationship to the natural environment" (Hart, 1995, p. 986). Thus, the NRBV seeks to examine how resources can result in competitive advantages as well as positive outcomes for the natural environment. For example, the capability to continuously improve and refine production processes can result in reduced emissions as well as lower costs (Hart, 1995), and a "capability of strategic proactivity" can result in first-mover advantages as well as more proactive environmental management (Aragón-Correa et al., 2008, p. 92). Moreover, research on the NRBV has shown the importance of considering resources not fully controlled by the focal firm, such as green suppliers (Andersén et al., 2020) and green supply chain management (Guang Shi et al., 2012). This highlights the relevance of incorporating another extension of the RBV, namely the relational RBV (Dyer and Singh, 1998), into the NRBV. In contrast to the traditional RBV, the relational RBV considers how resources not fully controlled by the focal firm (Kale et al., 2002; Lavie, 2006; Norman, 2002) affect a firm's ability to develop competitive advantages and firm performance. Thus, a RNRBV on product innovation considers two key extensions of the RBV and encompasses firm-level outcomes and environmental impact as well as the role of resources that are not fully controlled by the focal firm.

2.2. Conceptual framework

A RNRBV of product innovation is depicted in Fig. 1. As illustrated by the conceptual model, the main variable addressed in this paper is GPI. The overall idea of the NRBV is to identify and examine resources that result in environmental as well as financial performance (Hart, 1995; Hart and Dowell, 2010; Menguc and Ozanne, 2005). Consideration of the environment in product innovation practices is a well explored area, and various concepts such as green product development (Baumann et al., 2002; Chen, 2001), sustainable product innovation (De Medeiros et al., 2014; Severo et al., 2017), eco-design (Donnelly et al., 2006; Knight and Jenkins, 2009), eco-innovation (Bocken et al., 2012; Cheng and Shiu, 2012), and environmental new product development (Pujari, 2006; Pujari et al., 2003) have been used to address this issue. However, GPI is probably the most established concept (Dangelico, 2016) and is, in the present study, defined as new product development practices that "reduce the negative impacts and risks to the environment, utilize less resources and prevent waste generation," thereby resulting in products that provide "environmental benefits higher than conventional products" (Lin et al., 2013, p. 103). Thus, GPI will, by definition, result in improved environmental benefits, and an empirical examination of the relationship between GPI and environmental performance will merely result in tautological reasoning. Relationships not empirically examined in the present study, due to tautology, are represented by dotted lines in Fig. 1.

In contrast to the relationship between GPI and environmental performance, the relationship between GPI and firm-level financial outcomes is less straightforward. From a RBV, GPI can be seen as the realization of a bundle of resources and capabilities (Barney, 1991, 1995, 1997; Dangelico et al., 2017; Sirmon et al., 2007; Verona, 1999). However, the relationship between resources and aggregated firm performance is usually complex, and firms can have competitive advantages that are not reflected in superior firm performance in terms of high profitability (Andersén, 2011). For example, the value generated by the competitive advantage can be appropriated by stakeholders other than the owners (Coff, 1997, 1999), or the firm can have competitive disadvantages offsetting their competitive advantage (Ray et al., 2004). This can explain why "there is little empirical support that clearly demonstrates how green product innovation affects firm performance" and why the empirical studies on the relationship between GPI and overall firm performance have produced mixed results (Lin et al., 2013, p. 101). Moreover, it highlights the relevance of considering that the RBV sets out to explain how resources are used to "conceive of and implement their strategies" (Barney, 1991, p. 101) instead of examining possible direct effects on overall firm performance (Ray et al., 2004). Thus, as illustrated in the conceptual model, and as will be argued in the hypotheses section, GPI is expected to influence the possibility of implementing a differentiation strategy and thereby achieving a differentiation advantage. Moreover, it is the differentiation advantage, that is, the firm's ability to provide products with a higher customer-perceived value than its competitors (Porter, 1980, 1985, 1991), that will affect firm performance (Peteraf and Barney, 2003). Compared to the relationship between GPI and a cost advantage, the relationship between GPI and a differentiation advantage should be less straightforward. GPI includes several elements that, by definition, will result in lower costs. For example, a key dimension of GPI is the development of products that will reduce the use of materials and energy (Dangelico, 2016; Noci and Verganti, 1999; Zhu et al., 2008) and this will, by definition, result in reduced production costs and, as described by Hart (1995), a cost advantage. Thus, there is a risk that examining the relationship between GPI and cost advantage could be highly tautological, making the relationship between GPI and differentiation advantage

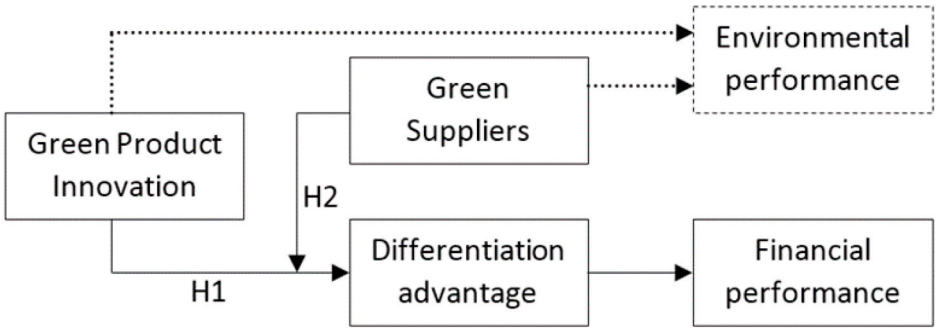

Fig. 1. Conceptual framework.

more relevant to address.

Green suppliers constitute the relational element of the conceptual model. The concept "green suppliers" refers to suppliers that are committed to environmental causes (Kannan et al., 2014; Kumar et al., 2014). Similar to GPI, having green suppliers will, by definition, result in improved environmental performance because a firm's suppliers play a key role in achieving an environmentally sustainable business (Andersén et al., 2020; Guang Shi et al., 2012; Lee, 2008). Thus, from a NRBV, it is relevant to examine how a relational resource, in terms of green suppliers, influences the relationship between GPI and differentiation. Although, several studies on both product innovation (Lau et al., 2010; Van Echtelt et al., 2008) and GPI (Chiou et al., 2011; Lee and Kim, 2011; Li et al., 2016) have highlighted the importance of suppliers' involvement in product development, there is a scarcity of studies specifically examining the role of suppliers in achieving a differentiation advantage based on GPI.

2.3. Hypothesized relationships

2.3.1. Green product innovation and differentiation advantage

The link between GPI and different dimensions of firm performance has been examined extensively in research on both innovation management (Pujari, 2006; Wong, 2012; Zhang and Walton, 2017) and environmental management (Chen et al., 2006; Dangelico et al., 2017). Although these studies have yielded different and contradictory results (Lin et al., 2013), there is some empirical evidence as well as several conceptual arguments to suggest that GPI will have a positive effect on a firm's ability to achieve a differentiation advantage. Concerning empirical studies, Chen et al. (2006) and Chang (2011) identified a positive relationship between GPI and overall competitive advantage. However, because the studies did not measure differentiation per se, they included various items not related to differentiation advantage. On the other hand, Wong (2012) specifically measured dimensions related to differentiation advantage and could confirm that differentiation was positively influenced by GPI in a sample of 203 Chinese firms.

GPI is expected to be related to a differentiation advantage for several reasons. Firms aspiring to achieve a competitive advantage not based on a cost leadership strategy have to "produce greater net benefits, through superior differentiation" (Peteraf and Barney, 2003, p. 314). There is an increased customer demand for green products, and offering greener products than competitors will make environmentally oriented customers value the product more highly than rival products (Chen et al., 2006; Noci and Verganti, 1999; Russo and Fouts, 1997). This notion is further accentuated by the fact that many firms demand that their suppliers deliver greener products in order to get or to maintain their own environmental certifications (Chen, 2005; Walton et al., 1998). Moreover, offering green products can increase the image of the company as environmentally friendly and thereby distinguish the company from its competitors (Porter and Van der Linde, 1995; Porter and Kramer, 2006). Although the attributes of a green product per se are likely to be the most important basis for a differentiation advantage, green products generally require leaner production processes (Florida, 1996; Gerstlberger et al., 2014) as well as lean product development processes (Dhingra et al., 2014; Johansson and Sundin, 2014). Thus, GPI could also result in a differentiation advantage in terms of reduced lead and delivery times.

For a differentiation advantage to be relevant, a firm has to be able to maintain this advantage. Thus, a key issue in the RBV is how competitive advantages can be sustained over time (Andersén et al., 2016; King, 2007; Reed and DeFillippi, 1990). The ability to be innovative in product development is generally based on a bundle of several resources, for example, technological capabilities, marketing capabilities and production capabilities (Verona, 1999). Excelling in GPI adds to the resource complexity because it also requires firms to consider various environmental issues (Dangelico et al., 2017). The RBV (Barney, 1991, 1995, 1997) and the resource management literature (Sirmon et al., 2007, 2011) have demonstrated the importance of bundles of resources for achieving and sustaining a competitive advantage. Thus, the complex resource configurations associated with GPI are likely to enable firms to maintain differentiation advantages based on their capability to develop green products, and this should make GPI an even more important source for differentiation advantage. Hence, the first hypothesis can be formulated as:

H1. Differentiation advantage is positively associated with GPI.

2.3.2. The moderating role of green suppliers on the relationship between green product innovation and differentiation advantage

I argue that using green suppliers will have a positive effect on the hypothesized relationship between GPI and differentiation advantage for two main reasons. First, to fully realize a capability, for example in terms of the bundle of resources needed to innovate green products, a firm generally needs complementary resources (Barney, 1995, 1997). Such resources "have limited ability to generate competitive advantage in isolation," but are necessary in order for a firm to fully realize its potential competitive advantage (Barney, 1995, p. 56). Complementary resources have been argued (King et al., 2003; Verona, 1999) and found (Lichtenthaler, 2009; Stieglitz and Heine, 2007) to be of importance for product innovation. Building long-term and committed relationships with suppliers can, for example, result in joint projects to develop new products, and such relationships can significantly enhance the product innovation processes of the focal firm (Potter and Lawson, 2013; Van Echtelt et al., 2008). For GPI, green suppliers can contribute resources, such as knowledge on environmental issues, and this can enable the focal firm to enhance its differentiation advantage (Chiou et al., 2011; Dangelico et al., 2017). Moreover, as shown by Lee and Kim (2011, p. 535), changing relationships with green suppliers "from traditional arm's length relationships to collaboration in supply chain relationships" can make the underlying capabilities resulting in GPI less imitable and, consequently, the differentiation advantage more sustained.

Second, in addition to the complementary resources provided by green suppliers, having green suppliers will also have a more direct

effect on the relationship between GPI and differentiation advantage. The overall environmental impact of a product will not only be the result of the manufacturing processes of the focal firm but will also be affected by the raw materials used and the components provided by suppliers (Andersén et al., 2020; Lee and Kim, 2011). Thus, using green inputs in the product development process and the resulting manufacturing process is likely to strengthen the differentiation advantage achieved by GPI (Pujari et al., 2003; Van Echtelt et al., 2008).

To summarize the role of green suppliers, in addition to providing green raw materials and components, green suppliers can also contribute important complementary resources and knowledge on environmental issues beneficial for the realization of GPI. Thus, the second hypothesis can be formulated as follows:

H2. The positive relationship between differentiation advantage and GPI will be positively moderated by the use of green suppliers.

3. Methodology

3.1. Sample

The population of the study is Swedish small manufacturing firms, that is, firms with 10–49 employees with a turnover of less than 10 million Euros, according to the European Union definition of small firms. The sample is a part of a larger research project on environmental management in SMEs. The relationships examined in this article have not been addressed in other publications based on this dataset. The sample should be relevant for examining the hypotheses for three main reasons: First, GPI, as defined in the present study, mainly concerns goods and not services, and this makes it relevant to delimit the study to the manufacturing industry. Second, compared to larger firms, small firms have a limited number of operations, and there should be fewer factors that could confound the examined relationships. Moreover, smaller firms are more likely to have cohesive operations (Andersén, 2019) and fewer suppliers (Houthoofd et al., 2010), whereas larger firms can have several competitive advantages and various strategic business units competing with different strategies. Third, compared to respondents from large corporations, the CEO of a smaller company is more likely to have an overview of the firm's operations and should be able to better assess the firm's operations and performance in relation to competitors (Wiklund and Shepherd, 2003).

Based on the European Community (NACE) industry classification, all limited companies from six industries were identified. The industries and other sample characteristics are listed in Table 1. The industries were selected because, in contrast to manufacturing firms focusing on, for example, repairs or food production, companies in these industries generally have some kind of product development of their own. Moreover, these industries had a sufficient number of firms. The database "Bisnode Infotorg Företag" was used to identify the companies. The database contains all Swedish limited companies, and a total of 2188 companies fulfilled the criteria, that is, being a small firm in one of the six industries. The CEO of each company was contacted by e-mail and was asked to complete an online survey. The initial mailing was followed by two reminders. A total of 305 useable answers for the issues addressed in the present paper were received, resulting in a response rate of 13.94%. I tested for non-response bias by comparing the firms answering the first e-mail with subsequent answers and there were no significant differences in the answers. As illustrated in Table 1, return on assets (ROA), adjusted for industry average, is equally distributed among the firms in the sample, and the average adjusted ROA for all firms was close to zero (- 1.15%). This should indicate that the sample is representative for the overall population.

Table 1
Sample characteristics.

	Number	Percentage
Average ROA (in relation to industry average)		
< (−20%)	16	5
(-11%) - (−20%)	42	14
(-1%) - (−10%)	108	35
0%–10%	91	30
11%–20%	31	10
>20%	17	6
Total	305	100
Number of employees		
10–19	157	51
20–29	70	23
30–39	46	16
40–49	32	10
Total	305	100
Industry (NACE)		
Chemicals and chemical products (20)	13	4
Rubber and plastic products (22)	39	13
Other non-metallic mineral products (23)	24	8
Basic metal products (24)	13	4
Fabricated metal products (25)	149	49
Machinery and equipment (28)	67	22
Total	305	100

3.2. Measures

A combination of objective and subjective data was used. The subjective data was collected by the online survey, and the objective data was collected from "Bisnode Infotorg Företag," the same database that was used to identify the companies. The subjective variables, including the results of the confirmatory factor analysis (CFA) described in the scale validation section, are presented in Table 2. The descriptive statistics and bivariate correlations of the variables are presented in Table 3.

3.2.1. Firm performance

Although differentiation advantage is the main dependent variable examined in this paper, it is highly established that a differentiation advantage will have a positive effect on overall firm performance (Peteraf and Barney, 2003; Porter, 1985). Moreover, because the other key variables in the model are subjective, having an objective variable in the model as the main outcome should increase the validity of the model and reduce some of the risks associated with using same source data. Therefore, I use objective ROA to measure overall firm performance. As suggested by Armstrong and Shimizu (2007), I subtracted the industry average (based on the average ROA for the industry defined according to NACE classification) for each company. Moreover, I used the average industry-corrected ROA based on the last three years.

3.2.2. Differentiation advantage

As illustrated in Table 2, five items were used to measure differentiation advantage. The scale is partly based on the scale used by Wong (2012), but it was modified to better reflect key dimensions of differentiation advantage (Campbell-Hunt, 2000). For example, not all products can be evaluated by their technical performance, measured by Wong (2012), and that item was replaced with the more generic concept of customer value and the more straightforward concept of enabling the firm to set higher prices. Two of the items, product quality and product uniqueness, specifically concern the attributes of the product. As recently described, because a differentiation advantage is based on the value, as perceived by customers, the scale takes the customer perspective into account by considering customer value and the possibility of setting higher prices. Finally, one of the items considers delivery reliability.

As previously described, for a differentiation advantage to affect performance it has to be sustained over time. As illustrated by Andersén et al. (2016), most studies on the RBV use non-longitudinal measurements of various competitive advantages, and this is also the most common research design in studies on GPI and competitive advantage (see, for example, Chang, 2011; Chen et al., 2006; Wong, 2012). Thus,

Table 2
Results for confirmatory factor analysis.

Item/Factor	Factor loading	Cronbach Alpha	CR	AVE	MSV
Green Product Innovation		0.89	0.89	0.73	0.43
Importance of the following factors when developing new products…					
Design of products for reduced consumption of material and/or energy	0.83				
Design of products for reuse, recycling and recovery of materials and components	0.93				
Design of products to avoid or reduce use of hazardous products and/or their manufacturing process	0.80				
Green Suppliers		0.90	0.90	0.65	0.43
Importance of the following factors when selecting suppliers…					
Cooperation with suppliers on environmental issues	0.88				
Suppliers' ability to provide environmentally friendly raw material and/or components	0.85				
The supplier's focus on environmental issues	0.93				
Environmental certification of the supplier	0.63				
Second-tier supplier's focus on environmental issues	0.70				
Differentiation Advantage		0.81	0.77	0.41	0.17
We have a competitive advantage in terms of…					
Product quality	0.82				
Product uniqueness	0.64				
Possibility to set higher prices	0.57				
Delivery reliability	0.55				
Delivering customer value	0.58				

CR = Composite Reliability.
AVE = Average Variance Extracted.
MSV = Maximum Shared Variance.
All factor loadings, P < .001.

several studies on different types of competitive advantages have, based on the RBV ideas developed by Barney (1991), assumed that resources that generate a competitive advantage are likely to have some attributes that make them difficult to imitate, which will sustain the competitive advantage. Nevertheless, and in contrast with previous studies on GPI and competitive advantage (Chang, 2011; Chen et al., 2006; Wong, 2012) and most other RBV studies on competitive advantage (Andersén et al., 2016), I also included the objective variable "firm performance" in the structural equation model. As will be addressed in the results section, differentiation advantage was strongly correlated to firm performance (β = 0.28, p < .001). Firm performance is a strong indicator of a competitive advantage (King and Zeithaml, 2001; Newbert, 2007), and the confirmed correlation should further increase the reliability of the measurement of differentiation advantage.

3.2.3. Green product development and green suppliers

GPI was measured using the three-item scale suggested by Zhu et al. (2008) for measuring eco-design. The scale for measuring green suppliers was also inspired by Zhu et al. (2008). However, as illustrated by Table 2, some alterations of the scale were made in order to adapt it to small manufacturing firms. For example, few SMEs are likely to undertake "environmental audit for suppliers' internal management" (Zhu et al., 2008, p. 271), and this item was not included in the scale.

3.2.4. Control variables

Firm size, firm age, and industry are used as control variables. These variables have been found to influence various performance outcomes of small firms (Wiklund and Shepherd, 2003, 2005) and have been used in previous studies applying the NRBV on small firms (Andersén et al., 2020). In order to achieve normality, age and size were transformed by logarithmic transformation. Industry was considered by using dummy variables based on NACE classification.

3.3. Data analysis methods

3.3.1. Scale validation

In order to ensure the reliability of the measurement instrument, I conducted a CFA of the subjective variables. The results of this analysis are presented in Table 2. The CFA indicates a good fit according the thresholds suggested by Hair et al. (2010) [χ^2/df = 0.834, p = .000; comparative fit index (CFI) = 0.979; Tucker Lewis index (TLI) = 0.972; goodness of fit index (GFI) = 0.951; adjusted goodness of fit index (AGFI) = 0.925; Root Mean Square Error of Approximation (RMSEA) = 0.052; standardized root mean residual (SRMR) = 0.040]. As depicted in Table 2, all factor loadings were significant, and the lowest factor score was 0.55. Although the average variance extracted (AVE) was 0.41 for differentiation advantage, composite reliability (CR) for this variable was 0.77, thus convergent validity (Malhotra and Dash, 2011), reliability as well as discriminant validity can be deemed acceptable. Moreover, the Harman's one-factor test was conducted and the one-factor solution explained 41.85% of the variance, indicating that common method variance is not a major issue.

3.3.2. Structural equation modeling

The hypotheses were tested by structural equation modeling (SEM) using maximum likelihood estimation. Hypothesis 2 concerns an interaction effect of GPI and green suppliers on differentiation advantage. As suggested by Dawson (2014), when examining interaction effects, all independent variables (except the industry dummy variables) were standardized, and the standardized values of GPI and green suppliers was multiplied to measure the interaction effect. In order to identify a possible interaction effect, GPI, green suppliers and the interaction effect were included in the SEM model. Moreover, in order to examine the relationships stipulated in the conceptual model (i.e. the expectation

Table 3
Descriptive statistics and correlation matrix.

	Mean	S.D.	1	2	3	4	5
1. Differentiation advantage	5.20	0.93					
2. Firm performance	−1.15	12.94	0.25**				
3. Firm age (log)	1.38	0.29	0.04	0.12*			
4. Firm size (log)	1.29	0.22	−0.07	−0.01	0.21**		
5. Green suppliers	3.58	1.36	0.26**	0.02	0.05	0.00	
6. GPI	5.00	1.54	0.35**	0.02	0.05	0.01	0.57**

**p < .01.
*p < .05.

that the independent variables examined will influence differentiation advantage and that this advantage will influence firm performance), the structural equation model also considers potential direct relationships between the independent variables (i.e. GPI, green suppliers and the interaction effect) and firm performance (i.e. ROA).

4. Results

The result of the SEM is presented in Fig. 2. The model fit was highly satisfactory [χ^2/df = 0.137, p = .340; CFI = 0.998; TLI = 0.977; GFI = 0.996; AGFI = 0.952; RMSEA = 0.021; SRMR = 0.019]. The relationships between the variables are detailed in the figure. Solid lines represent significant relationships, whereas dashed lines represent insignificant relationships. The effects of the control variables are not included in the visual presentation of the model, and the only significant control variable was the industry variable NACE 24. This variable has a negative effect on differentiation advantage ($\beta = -0.12$, p < .005).

As illustrated by Fig. 2, Hypothesis 1 is supported. GPI has a significant effect on differentiation advantage ($\beta = 0.35$, p < .001). Moreover, differentiation advantage has an effect on financial performance ($\beta = 0.28$, p < .001), whereas GPI has no direct effect on financial performance ($\beta = -0.08$, p > .1). Thus, as stipulated in Hypothesis 1 and by the arguments for the conceptual model, GPI will influence differentiation advantage, and it is the differentiation advantage that will affect firm performance.

Hypothesis 2 stipulates a positive moderating effect of green suppliers on the relationship between GPI and differentiation advantage. The interaction effect of GPI and green suppliers on differentiation advantage is significant ($\beta = .12$, p < .05), thus providing support for Hypothesis 2. The nature of the interaction effect is illustrated in Fig. 3 and, as depicted, green suppliers will positively moderate the relationship between GPI and differentiation advantage. Noticeably, the results indicate that firms not focusing on GPI will not benefit at all from having green suppliers in terms of achieving a differentiation advantage, and not having green suppliers can actually be more beneficial for firms inferior in GPI.

5. Discussion

5.1. Theoretical implications

This study provides several contributions to the emerging NRBV on product innovation. Whereas, for example, Claudy et al. (2016) examined antecedents to successful new product development from a NRBV by examining the role of specific resources and capabilities, other NRBV studies (Bermúdez-Edo et al., 2017; Lee and Min, 2015; Li et al., 2016; Pujari, 2006) have studied the relationship between GPI (or related concepts) and overall performance. In this study, I have respected the original ideas of the RBV that resources will affect a firm's ability to implement a strategy (Barney, 1991). The RBV has received some criticism for not addressing the "black box" between resources and firm performance (Kraaijenbrink et al., 2010; Rouse and Daellenbach, 2002; Sirmon et al., 2007), and by focusing on an intermediate step between GPI and firm performance, in terms of differentiation advantage, the present study addresses some aspects of this weakness of the RBV. Thus, the present study provides a more detailed examination of how firms can create customer value by considering environmental issues in their product innovation practices. By confirming the hypothesized relationship on GPI and differentiation advantage, the study provides additional support for the relevance of the NRBV in the context of product innovation. Moreover, the results demonstrate the strength of this less aggregated approach for examining the effects of GPI, and they support the suggestion of Ray et al. (2004) to examine less aggregated outcomes than, for example, overall profitability in RBV studies. When considering differentiation advantage, there is no direct relationship between GPI and firm performance, and this illustrates the usefulness of examining how GPI influences performance by way of specific strategies.

Another contribution to the NRBV on product innovation is that the study incorporates a relational element in terms of the role of green suppliers. Addressing suppliers can contribute to the development of a RNRBV of product innovation. Relational resources, provided by suppliers, can directly contribute to a competitive advantage (by being strategic in terms of being valuable, rare, imperfectly imitable, and non-substitutable) (Barney, 1991), or the supplier's resources can be complementary resources that can help a firm to fully realize its strategic resources (Barney, 1995; King et al., 2003). The correlation matrix illustrates a significant relationship between green suppliers and differentiation advantage. This implies that resources provided by green

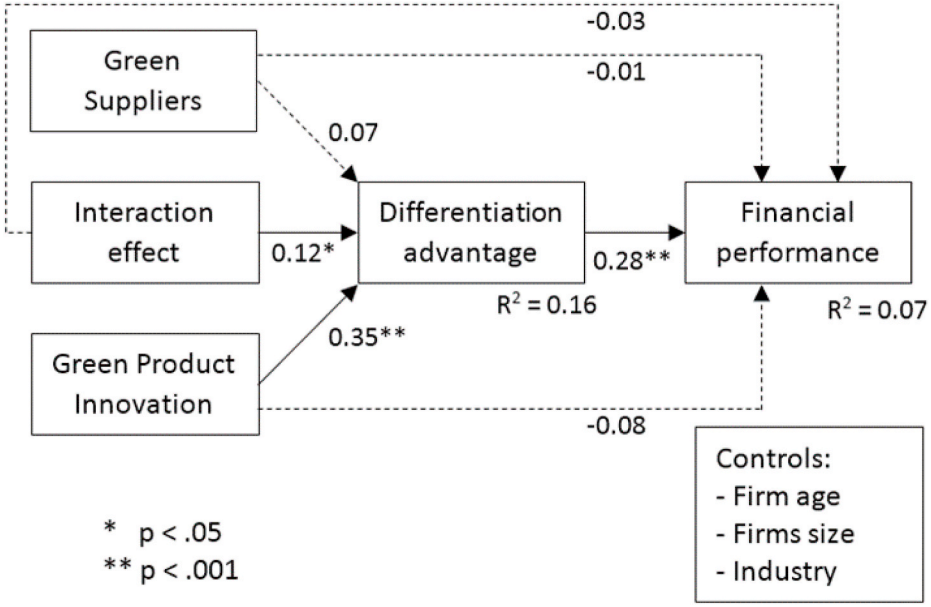

Fig. 2. Results from structural equation modeling.

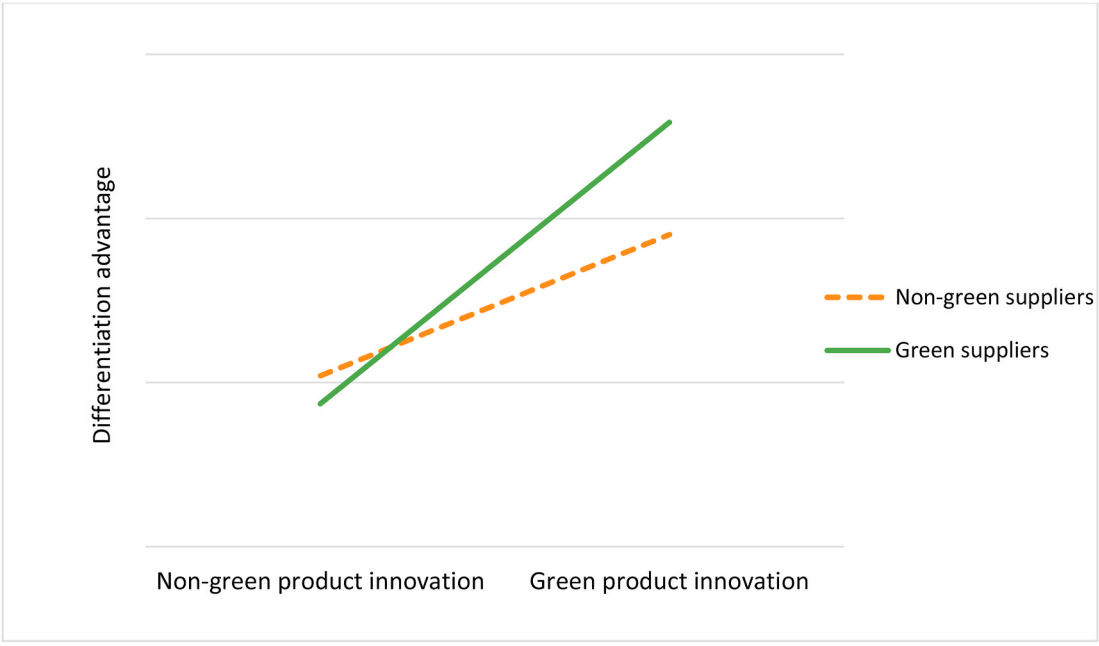

Fig. 3. The moderating effect of green suppliers on the relationship between green product innovation and differentiation advantage. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

suppliers can be of a strategic nature and could, when not scrutinized in detail, seem to provide support for studies that have found green suppliers to be beneficial for aggregated performance outcomes (Andersén et al., 2020; Green et al., 2012; Yu et al., 2017). However, when also considering GPI, the effect of GPI will offset the direct relationship between green suppliers and differentiation advantage. These results indicate that, in the context of GPI, green suppliers mainly provide complementary resources that can help firms to realize GPI, thus, the resources provided by green suppliers for GPI are not of a strategic nature. The findings provide more generalizable empirical support to previously conducted case studies highlighting the role of green suppliers for realizing the full potential of GPI (Lee and Kim, 2011; Melander, 2017).

The study also contributes to research on how GPI contributes to firm performance, regardless of the theoretical framework. In the recent review on GPI by Dangelico (2016), studies examining the outcomes of GPI have mainly addressed aggregated firm performance measures, but a few studies have examined how GPI is related to competitive advantage. Although Wong (2012) could identify a positive relationship between GPI and differentiation advantage in Chinese firms, the present study provides validation of this relationship in a Western business context in terms of small Swedish firms. Moreover, it extends Wong's (2012) findings by considering the role of green suppliers and by confirming that differentiation advantage, originating from GPI, will influence overall firm performance.

5.2. Managerial implications

The results of this study offer some managerial implications. First, they highlight that going green in terms of GPI is not directly related to firm performance, in terms of profitability, and merely suggesting to managers that they adopt GPI in order to increase profitability is an oversimplification of the effects of GPI. Excelling in GPI can help firms to strengthen or to develop a differentiation advantage and this can enhance firm performance, but managers should be aware of this intermediate step from GPI to profitability. Second, although having green suppliers will increase the impact GPI has on the possibility of achieving a differentiation advantage, firms that do not have green suppliers will still benefit from GPI if they seek to achieve a differentiation advantage. On the other hand, having green suppliers cannot compensate for the lack of GPI, and the results indicate that firms inferior in GPI can benefit more by focusing on other supplier attributes besides their "greenness."

Although the study provides a more complex picture of the relationship between GPI and its effect on firm performance than some previous studies (Leenders and Chandra, 2013; Lin et al., 2013), the study does provide additional empirical evidence for the positive firm-level outcomes of considering environmental issues in product innovation. Moreover, it highlights that having green suppliers will enhance these outcomes. Thus, the most important managerial implication is quite straightforward: firms competing on product differentiation will benefit from GPI, and they will benefit even more if they focus on building strong supplier relationships with environmentally oriented suppliers.

5.3. Limitations and future research

The sample examined in this study concerns a specific country and a specific firm size, that is, Swedish firms with 10–49 employees. As previously described, the relationship between GPI and differentiation advantage has also been identified in a sample of Chinese firms (Wong, 2012) of various sizes, and this indicates that the findings of a positive relationship between GPI and differentiation advantage is valid in different empirical settings. Nevertheless, future research is advised to test the applicability of these findings on other samples.

Another limitation and avenue for future research is that relational resources do not necessarily have to be restricted to suppliers. Although the ambition of this study has been to contribute to the development of a RNRBV of product innovation, this article has only provided a first piece of the puzzle. In order to truly consider the relational element of the suggested approach to product innovation, relations other than supplier relationships should be considered. Previous studies have accentuated the importance of customers for GPI (Hoffmann, 2007; Johansson and Sundin, 2014), and the relational RBV has shown the importance of strategic alliances for successful product development (Dyer and Singh, 1998; Wang and Li-Ying, 2015). Thus, in order to develop a more comprehensive RNRBV on product innovation, future research is encouraged to consider additional inter-firm relationships.

The cross-sectional research design has some limitations. Because

data was collected at one specific occasion, it is not possible to examine the exact nature of the relationships between the variables examined. It could, for example, be expected to take some time before a GPI capability is manifested in production processes, for these processes to generate a differentiation advantage, and for the advantage to be manifested in firm performance. Ideally, the data on, for example, differentiation advantage could have been collected on later occasions. However, as shown by other studies on small firms (Choongo, 2017; Wiklund, 1999; Wiklund and Shepherd, 2005), collecting data from the same respondents on several occasions is likely to significantly decrease the response rate. For example, Wiklund (1999) collected data from a specific sample during three consecutive years and this reduced the final sample to merely 16% of the original sample. Thus, in order to maintain an acceptable response rate it was deemed necessary to collect the data on one occasion despite the limitations associated with this approach. Although this approach is common in most studies on GPI and performance (Chang, 2011; Chen et al., 2006; Dangelico et al., 2017; Lin et al., 2013 Wong, 2012; Pujari, 2006), future research is recommended to conduct more longitudinal studies in order to examine how GPI and differentiation advantage are related over time. Such research designs can be inspired by the longitudinal studies on the RBV by, for example, Bogner and Bansal (2007), Choi and Wang (2009) and Ndofor et al. (2011).

6. Conclusion

By addressing how resources that are controlled by a firm contribute to the firm's competitive advantage, it is apparent that the original ideas outlined in the RBV are highly firm-centric. However, research on product innovation has highlighted the importance of other stakeholders for innovating new products and has also focused on the environmental impact of product innovation. By combining the relational RBV and the NRBV, I have argued for, and empirically demonstrated, the relevance of a RNRBV on product innovation. By showing that GPI affects differentiation advantage and that the relationship is strengthened by having green suppliers, I have examined what should be key variables of a RNRBV on product innovation. In order to develop a more comprehensive RNRBV, future research on product innovation is advised to examine the relationships in more detail and in other cultural contexts, and, also, to include additional relational variables.

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