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*Published in:*  
Journal of Cleaner Production

*DOI:*  
[10.1016/j.jclepro.2019.07.013](https://doi.org/10.1016/j.jclepro.2019.07.013)

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*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2019

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*  
Eikelenboom, M., & de Jong, G. (2019). The impact of dynamic capabilities on the sustainability performance of SMEs. *Journal of Cleaner Production*, 235, 1360-1370.  
<https://doi.org/10.1016/j.jclepro.2019.07.013>

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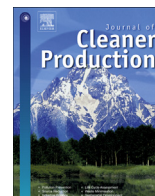
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# The impact of dynamic capabilities on the sustainability performance of SMEs

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## ARTICLE INFO

### Article history:

Received 25 May 2018

Received in revised form

15 June 2019

Accepted 2 July 2019

Available online 2 July 2019

Handling Editor: Tomas B. Ramos

### Keywords:

Sustainability performance

SMEs

Dynamic capabilities

## ABSTRACT

Despite environmental and social goals being identified as key objectives for small- and medium-sized enterprises (SMEs), the literature has not provided an explanation of how these goals can be achieved alongside stable economic outcomes. Several researchers have argued that sustainability performance should be addressed through a process of constant adjustment, which can be facilitated by dynamic capabilities. The aim of this study is to investigate the effect of integrative dynamic capabilities on the social, environmental and economic performance of SMEs. This study is among the first to investigate this effect and uses unique survey data from 297 SMEs in the Netherlands. The empirical results highlight the importance of external integrative dynamic capabilities for all three pillars of sustainability performance in SMEs. These findings contribute to the debate on the ability/inability of SMEs to balance social, environmental and economic objectives by integrating new insights from the dynamic capabilities literature.

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## 1. Introduction

It has been acknowledged that without the systematic support of businesses, society will not achieve the 17 sustainable development goals set by the United Nations in 2015 (Hockerts and Wüstenhagen, 2010; Nawaz and Koç, 2018). Businesses need to address their sustainability performance, which requires achieving a positive economic, social and environmental performance over the long-term (Jamali, 2006 p.812). Sustainability has long been perceived to be the domain of large corporations, with the potentially significant contributions of SMEs to sustainable development receiving less attention (Bos-Brouwers, 2010; Graafland and Smid, 2016). Environmental and social concerns, such as the rising prices of energy and increasing community involvement, can pose significant challenges and offer great opportunities to SMEs (Graafland and Smid, 2016). Research has described approaches to sustainability management in large corporations; however, these approaches are not necessarily suited to SMEs due to the important strategic differences between large and small firms (Johnson and Schaltegger, 2016).

Sustainability management involves balancing the often

conflicting objectives of the three pillars of sustainability, including social, environmental and economic objectives (Lehtonen, 2004). With few exceptions, most studies have not explained how environmental and social goals can be achieved in SMEs alongside stable economic outcomes (Johnson and Schaltegger, 2016). Research addressing this issue has provided conflicting results. On one hand, it has been argued that SMEs are only able to focus on single pillars of sustainability and tackle sustainability issues in an ad-hoc manner (Hockerts and Wüstenhagen, 2010). Due to their financial, human and operational resource constraints, SMEs find the development of capabilities to address sustainability a complicated task that can increase their cost burden and even lead to a loss of competitiveness in the market (Dyllick and Hockerts, 2002; Hockerts and Wüstenhagen, 2010). On the other hand, empirical findings have shown that SMEs can simultaneously act as drivers of all three pillars of sustainability due to their idealism, flexibility and innovativeness (Aragon-Correa et al., 2008). The question of whether and how SMEs can overcome their resource constraints and develop the necessary enabling organizational capabilities to simultaneously drive all three pillars of sustainability performance has remained unexplored to date. The first contribution of this study concerns how organizational capabilities simultaneously relate to all three pillars of the sustainability performance of SMEs. In addressing this issue, this research responds to calls for more SME-level sustainability research (Johnson

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and Schaltegger, 2016).

The second contribution consists of providing a stepping stone towards a more detailed investigation of the link between the dynamic capabilities and sustainability performance of SMEs. Dynamic capabilities are organizational processes that intentionally modify, change and renew a firm's resource base (Ambrosini and Bowman, 2009). Dynamic capabilities are a source of sustained competitive advantages in situations in which the competitive landscape is characterized by rapid and unpredictable changes (Teece, 2007). This research is the first to use insights from the dynamic capabilities literature to explain how SMEs can simultaneously drive their social, environmental and economic performance. Due to the rapidly changing and unpredictable nature of sustainability (O'Neil and Usbasaran, 2016), it has been argued that successful sustainability requires constant adjustments, which can be enabled by dynamic capabilities (Arend, 2014). We propose that in the specific context of SMEs, integrative dynamic capabilities, which are processes that enable a firm to integrate assets and resources, resulting in new resource configurations (Ambrosini and Bowman, 2009), are of major importance. These dynamic capabilities can assist SMEs to constantly integrate the preferences and knowledge of their stakeholders (Ayuso et al., 2006) and to develop holistic solutions for sustainability (Daily and Huang, 2001). Therefore, the authors propose that integrative dynamic capabilities can assist SMEs to: (1) address their sustainability performance at lower costs and (2) increase the success and market performance of their sustainability initiatives, leading to an increased environmental, social and economic performance. Building on the strategic management perspective of dynamic capabilities, owner/manager transformational leadership and perceptions of sustainability are proposed to be highly important in driving these integrative dynamic capabilities (Matzler et al., 2008). By combining insights from the sustainability, dynamic capabilities and strategic management literature with unique survey data from 297 Dutch SMEs, the authors formulated and tested hypotheses.

The remainder of this article is structured as follows. Section 2 reviews the sustainability and dynamic capabilities literature, which serves as the foundation for this research. Building on this background, hypotheses regarding the effects of dynamic capabilities on the sustainability performance of SMEs are formulated. Subsequently, section 3 and 4 present the methods used and the results of the survey study, respectively, and the paper concludes with a discussion of the implications and possible avenues for future research in section 5.

## 2. Literature and hypotheses

### 2.1. Dynamic capabilities and sustainability performance

Teece et al. (1997) distinguished between four main types of dynamic capabilities, including (1) reconfiguration—transforming and recombining assets and resources; (2) leveraging—replicating a process or system operating in one business unit into another; (3) learning—experimenting and reflecting on failures and successes; and (4) integrating—integrating assets and resources, resulting in a new resource configuration. Researchers have suggested that these dynamic capabilities should be applied to understand the process of sustainability, as this process is dynamic, complex and characterized by constant and unpredictable change (Arend, 2014). Guidelines for sustainability are often ambiguous, and technologies, beliefs, and institutional approaches to sustainability are constantly changing (O'Neil and Usbasaran, 2016). Researchers have argued that companies need to be flexible and adaptive through a process of continuous adaptive learning, change, improvement and development to deal with the constantly

changing environment around sustainability (Arend, 2014). Dynamic capabilities are crucial in allowing firms to achieve such adaptive flexibility and make constant adjustments (Arend, 2014; Chen and Chang, 2013).

The impact of dynamic capabilities on firm performance has been a key question among scholars, who have predicted a positive influence of dynamic capabilities on performance (Drnevich and Kriauciunas, 2011). An example of this is the work of Protoyerou et al. (2011), which showed a positive relation between dynamic capabilities and firm profitability. Researchers have also started to explore the links between dynamic capabilities and sustainability, including environmental, social and economic aspects. For example, Marcus and Anderson (2006) investigated how dynamic capabilities can lead to the acquisition of both business and social competencies. Furthermore, in a survey study, Mousavi et al. (2018) found a positive effect from sensing, seizing and reconfiguring dynamic capabilities on innovations for sustainability. The concept of dynamic capabilities has also been translated into a sustainability context, referring to 'the firm's ability to address the rapidly evolving sustainable expectations of stakeholders by purposefully modifying functional capabilities for the simultaneous pursuit of economic, environmental and social competences' (Wu et al., 2012, p.233). Several exploratory articles have indicated a positive relationship between these 'sustainability dynamic capabilities' and different sustainability aspects in firms. For example, through a survey study of 189 manufacturing companies, Dangelico et al. (2017) found a positive relationship between sustainability dynamic capabilities, eco-design capabilities and green innovation capabilities.

However, the relationship between dynamic capabilities and sustainability performance in SMEs has remained unclear in the literature (Arend, 2014). There are several explanations for this. First, researchers have relied on different types of dynamic capabilities without offering a thorough explanation. These types of dynamic capabilities range from general dynamic capabilities (Marcus and Anderson, 2006) to green dynamic capabilities (Chen and Chang, 2013). Researchers have addressed the four main types of dynamic capabilities—reconfiguring, integration, learning and leveraging (Arend, 2014)—as well as other types, such as scanning, identification (Wu et al., 2012), comparing and evaluating (Marcus and Anderson, 2006). This focus on different types of dynamic capabilities has led to incomplete and even contrasting findings. For example, Marcus and Anderson (2006) only found a positive relationship between dynamic capabilities and business competencies, while Arend (2014) found a positive relationship between dynamic capabilities and green activities. A second reason for the lack of clarity in the current literature is that none of the studies identified has focused on the effects of dynamic capabilities on all three pillars of sustainability performance. Researchers have explored the effects of dynamic capabilities on different sustainability concepts, including green innovation, for example (Dangelico et al., 2017), without including the effects on sustainability performance. It is thus unclear whether dynamic capabilities help align economic, environmental and social performance. Finally, researchers have primarily focused on the dynamic capabilities of large corporations, and it thus remains unclear which types of dynamic capabilities are important to SMEs.

### 2.2. Dynamic capabilities driving sustainability performance in SMEs

Some dynamic capabilities may be more important than others depending on specific firm situations (Ambrosini and Bowman, 2009). For instance, resource building and reconfiguration dynamic capabilities were found to positively relate to market

performance in the context of large manufacturing firms (Dangelico et al., 2017). However, resource integration dynamic capabilities were not found to positively relate to market performance within this context. This effect may have been caused by the substantial resource base and established market presence of large firms, which reduce the need for external resource integration dynamic capabilities. SMEs concerned with sustainability experience specific circumstances that differ from those of large firms (Bos-Brouwers, 2010). These circumstances include, among others, a smaller resource base and a lack of communication systems, lower pressure for sustainability from consumers and governments, lower degree of formalization, and stronger local embeddedness. The dynamic capabilities that drive sustainability performance in large firms may thus not drive sustainability performance in SMEs. We propose that in the specific context of SMEs, integrative dynamic capabilities are particularly important, as they can assist SMEs in overcoming resource constraints and increasing the success of sustainability efforts. We make a distinction between the effects of external and internal integrative dynamic capabilities.

External integrative dynamic capabilities relate to processes that integrate the resources and capabilities of parties outside the organization, such as suppliers and customers (Bowman and Ambrosini, 2003). These processes enable SMEs to address their sustainability performance in two ways. First, these processes assist firms in constantly integrating the creative and practical knowledge of their stakeholders (Ayuso et al., 2006). Relationships with stakeholders that foster sustainability are especially important (Ayuso et al., 2006). These dynamic capabilities enable SMEs to address sustainability at lower costs, as each SME does not need to develop all of the sustainability knowledge from scratch, or 'reinvent the wheel' (Boons and Lüdeke-Freund, 2013). Second, external integrative dynamic capabilities can enable SMEs to constantly address the knowledge and preferences in terms of sustainability, of their suppliers, government, consumers and local context (Klewitz and Hansen, 2014), which enables SMEs to continuously adapt their sustainability initiatives to these preferences and can, in turn, increase the success and market performance of the initiatives (Dangelico et al., 2017).

Internal integrative dynamic capabilities relate to processes that integrate the resources and capabilities of individuals inside the organization (Bowman and Ambrosini, 2003). These processes enable SMEs to address their sustainability performance in two ways. First, these processes facilitate the continuous exchange of knowledge among employees and between departments (Petroni, 1998). This continuous exchange not only results in a decrease in duplicated efforts but also enables a holistic and low-cost solution for sustainability (Daily and Huang, 2001). For example, the elimination of pollution from the source requires cooperation between manufacturing, planning and purchasing areas (Kitazawa and Sarkis, 2000). Second, internal integrative dynamic capabilities assist SMEs in executing sustainability, as they facilitate trust among employees (Choi, 2006). Trust is important, as it grants individual employees the confidence to invest in collective activities such as sustainability (Kitazawa and Sarkis, 2000) since they know that others will also do so (Pretty, 2003). Internal integrative dynamic capabilities can thus increase the willingness of employees to engage and invest time in sustainability activities, which in turn, assists the organization in consistently delivering sustainability (Collier and Esteban, 2007).

Thus, when addressing their sustainability performance, SMEs face a highly uncertain and changing environment that requires them to engage in a process of constant adjustment (Arend, 2014). Due to the specific context of SMEs (Bos-Brouwers, 2010), it is argued that integrative dynamic capabilities offer important advantages to SMEs. First, these dynamic capabilities assist SMEs in

addressing their sustainability performance at lower costs, overcoming resource constraints and relieving the cost burden when addressing sustainability (Boons and Lüdeke-Freund, 2013; Daily and Huang, 2001). Taking the above factors into account, it is likely that integrative dynamic capabilities increase the ability of SMEs to invest in constant adjustments of their social and environmental performance while simultaneously addressing their economic performance. Second, integrative dynamic capabilities assist SMEs in consistently executing sustainability, adapting sustainability activities according to the changing preferences of their stakeholders and increasing their market performance and the success of sustainability initiatives (Collier and Esteban, 2007; Dangelico et al., 2017). Therefore, we formulate the following hypotheses:

**H1.** External integrative dynamic capabilities are positively related to the social, environmental and economic performance of SMEs.

**H2.** Internal integrative dynamic capabilities are positively related to the social, environmental and economic performance of SMEs.

### 2.3. Managerial attributes influencing integrative dynamic capabilities in SMEs

Developing dynamic capabilities can be difficult for SMEs and may take years or even several decades (Teece & Pisano, 1994). Despite the challenges, research has shown that SMEs exhibit several dynamic capabilities (Borch and Madsen, 2007). Researchers adopting the managerial perspective on dynamic capabilities have argued that owners/managers play an important role in the development of dynamic capabilities, as they direct operations, decide how resources are used, and sense and grasp new opportunities (Augier and Teece, 2009; Zahra et al., 2006). Owners/managers have considerable strategic discretion over the allocation of resources in SMEs, which offers them the opportunity to drive dynamic capabilities (Augier and Teece, 2009; Matzler et al., 2008). Despite facing similar conditions in the external environment, owners/managers have been expected to make different decisions about the dynamic capabilities that could be further developed (Zahra et al., 2006). The diversity in decision-making largely results from differences in managerial attributes, including managerial social capital and cognition (Adner and Helfat, 2003). Following these arguments, two managerial attributes, transformation leadership and perceptions of sustainability, are likely to have a significant impact on the establishment of integrative dynamic capabilities in SMEs.

Transformational leadership refers to a leader moving their team beyond immediate self-interest by appealing to their values, emotions, attitudes and beliefs (Bass, 1999). Key dimensions of transformational leadership include articulating a vision, fostering the acceptance of group goals, modelling behaviours consistent with the articulated vision, providing individualized consideration, setting high performance expectations, and providing intellectual stimulation (Podsakoff et al., 1996). Transformational leadership behaviours, such as fostering the acceptance of group goals, enable leaders to facilitate a climate of collaboration in the organization (Goody et al., 2009). For instance, findings have shown that transformational leaders increase followers' identification with the group (Kark et al., 2003). In such a climate, employees are more likely to contribute to group objectives and communicate with others in the organization (Bono and Judge, 2003). Transformational leadership can thus enable leaders to motivate group members to work towards common goals and to coordinate and



communicate within the group. For example, Özaralli (2002) found that employees working under transformational leaders expressed high levels of efficient within-group communication. Transformational leaders also experience the benefits of collaboration in overcoming obstacles for goal accomplishment and will thus see a greater need to develop processes that internally integrate employees (Gooty et al., 2009). Therefore, owners/managers who exhibit transformational leadership behaviours will be better able to drive and devote more resources to internal integrative dynamic capabilities, which leads to the third hypothesis:

**H3.** Transformational leadership is positively related to internal integrative dynamic capabilities.

Implementing stakeholder concerns about sustainability can be an ambiguous requirement for owners/managers of SMEs (Seidel et al. 2009). For instance, it has been shown that the awareness and implementation of tools for assisting corporations to systematically address their sustainability performance were low among SMEs (Johnson, 2015). To reduce ambiguity and unpredictability, owners/managers can perceive sustainability as an opportunity or a threat to their organization (Jackson and Dutton, 1988; Sharma, 2000). Adopting sustainability may require radical innovation and can add complexity to production and delivery processes (Russo and Fouts, 1997). Dealing with radical innovation and increased complexity may pose a threat to SMEs due to the previously mentioned resource constraints, including a lack of knowledge and limited financial resources (Hockerts and Wüstenhagen, 2010). Therefore, the owner/managers of SMEs may interpret sustainability as a threat to their organization. On the other hand, owner/managers may interpret sustainability as an opportunity for their organization due to the possibility of increased innovation potential and the opportunity to address niche markets (Darcy et al., 2014). Researchers have emphasized the importance of owner/manager perceptions in the implementation of sustainability in organizations (Patzelt and Shepherd, 2011). Sharma (2000) proposed that owners/managers who perceive environmental issues as threats do not feel a need to change their organization and will devote less time and resources to the acquisition and installation of new technologies that involve environmental goals. Barrales-Molina et al. (2010) found that if owners/managers felt that there was a need to adapt their organization to the external environment, then they would promote the generation of dynamic capabilities. Combining these insights, it is arguable that owners/managers who perceive sustainability as a threat will not feel a need to change their organization, which will in turn, lead them to direct fewer resources toward dynamic capabilities related to the integration of external sustainability-related knowledge and resources. These insights lead to the following hypothesis:

**H4.** The owner/manager's perception of sustainability as a threat is negatively related to external integrative dynamic capabilities.

Fig. 1 Presents the research model of this study.

### 3. Data and method

#### 3.1. Research design

Primary data to test the model was collected in a carefully designed survey. The survey was designed in four steps. First, the literature on dynamic capabilities, transformational leadership, managerial cognitions and sustainability performance was reviewed to identify established measures and items. Second, interviews with owners/managers of SMEs were conducted. SMEs were selected on the basis of their differences in sustainability

reporting and similarities regarding size, geographic region, function and age. The results of the interviews helped in designing the survey and measurements; understanding the logic of dynamic capabilities in the SME setting; validating the core concepts studied in this paper; and interpreting the implications of the findings. Third, the questionnaire was developed following recommendations on survey design by Krosnick and Presser (2009), Forza (2002) and Hinkin (1995). These included, among other suggestions, the use of simple syntax, relevant and clear scales, and an appropriate order of questions. Fourth, the questionnaire was translated using rigorous forward-backward protocols and tested. A panel of four SME owners/managers and two sustainability scholars assessed the survey. The final questionnaire was again tested among ten owners/managers of SMEs in the Netherlands.

#### 3.2. Participants and procedures

The population of this study included Dutch-owned small- and medium-sized enterprises (5–500 employees). A non-probabilistic sampling strategy was adopted, reducing the sample to SMEs in Friesland, a northern province of the Netherlands with approximately 650,000 inhabitants. Respondents from the province were selected to ensure that the enterprises faced similar institutional environments regarding sustainability. For this purpose, a random sample of 1500 SMEs from the regional chamber of commerce was acquired. For each of the targeted companies, the director or senior manager directly responsible for leadership of the firm was identified. This information was used to personalize the invitation letter. Data were collected between May and July 2017. Paper and pencil surveys were sent out to all corporations, followed by a reminder two weeks later. Only 42 questionnaires were not delivered, primarily due to unknown relocation or bankruptcy of the company (2.8%). In total, 333 firms responded to the survey, with 36 responses unusable because the questionnaires were incomplete, leaving 297 useable observations. This represents a 20% response rate with respect to the 1458 questionnaires that were successfully distributed.

The average age of the respondents was 50.65 (SD = 9.53), and their average work duration was 19.44 years (SD = 10.99). The gender of most respondents was male (260 male, 37 female). The average organizational age in this sample was 47.19 years (SD = 42.57), and the average number of employees was 32.40 (SD = 49.29). The firms represented a range of industries: agriculture 3.7%; industry 12.8%; building 11.1%; wholesales 17.5%; recreation 15.5%; business services 5.4%; transportation 13.5%; computers and IT 2.7%; healthcare 9.8%; and other industries 8.1%.

A comparison of the responding to non-responding firms indicated no significant differences concerning the firm size, firm age or sector. Additionally, no significant differences between early and late respondents were found. Several recommended procedural methods to reduce the risk of common method bias were used, including: (1) ensuring anonymity, (2) decreasing the risk of social desirability bias, (3) carefully evaluating all survey items, (4) adopting different scale endpoints and formats for predictor and criterion variables, and (5) distancing dependent and independent variables with a logical order from each other in the survey (Podsakoff et al., 2003). Single-respondent bias was further limited, as the survey addressed small organizations and targeted top managers as respondents (Arend, 2014).

Confirmatory factor analysis (CFA) was performed to investigate whether all survey items were loaded on a 'common' method factor and to assess whether the data may have featured significant common variance. The CFA analysis yielded a poor model fit to the data, with  $\chi^2(209) = 1733.99$ , RMSEA = 0.16, CFI = 0.35 and NFI = 0.33, suggesting that common method bias was unlikely to be

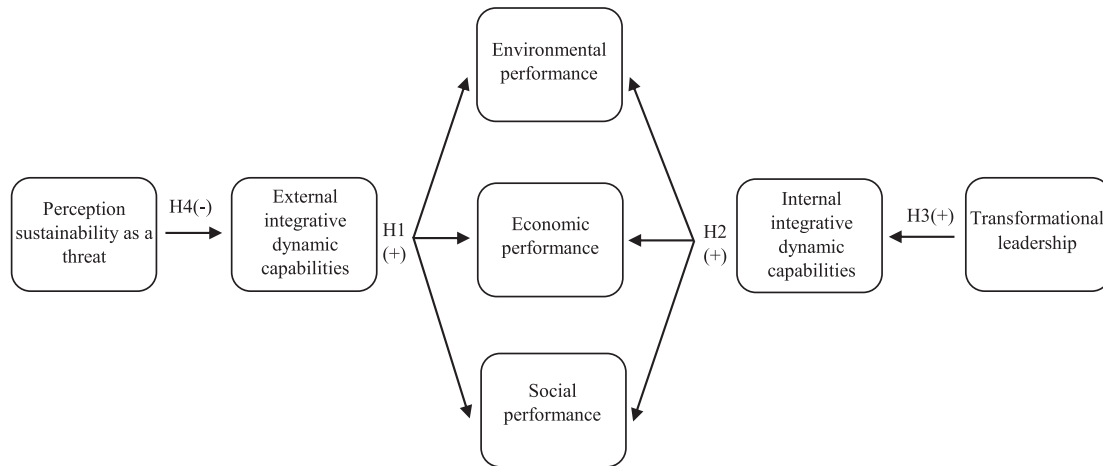


Fig. 1. Research model.

a problem in the data.

### 3.3. Measures

#### 3.3.1. Transformational leadership

To measure transformational leadership, the Global Transformational Leadership Scale developed by Carless et al. (2000) was adopted. Following the prompt of 'How often do you engage in the following behaviours?', items included: (1) 'Communicating a clear and positive vision of the future', (2) 'Fostering trust, involvement and cooperation among team members', (3) 'Treating staff as individuals, support and encourage their development', (4) 'Giving encouragement and recognition to staff', (5) 'Encouraging thinking about problems in new ways and questioning assumptions', (6) 'Being clear about my values and practising what I preach', and (7) 'Instilling pride and respect in others' ( $\alpha = 0.80$ ). Owners/managers responded to these items on a frequency scale ranging from 1 = 'Rarely or never' to 5 = 'Very frequently, if not always'.

#### 3.3.2. Manager's perception of sustainability

The owner/manager's perception of sustainability was measured using an adapted version of Sharma (2000) three-item measure of managers' perceptions of environmental issues. In particular, the items were adapted to include sustainability rather than only Sharma (2000) environmental dimension. Following the prompt of 'To what extent do you agree with the following statements', the items included: (1) 'I am likely to lose rather than gain by actions related to sustainability', (2) 'Actions that I may take for sustainability objectives are constrained by others in the organization' and (3) 'I lack the technical knowledge to reduce the negative sustainability impact of company operations'. Owners/managers responded to these items on a seven-point Likert scale ranging from 1 = 'Totally disagree' to 7 = 'Totally agree'. Although the Cronbach's alpha value of 0.54 was below the threshold value, the indications for unidimensionality (1 factor extracted with significant factor loadings  $> 0.4$ ) and convergent and divergent validity of the construct were good. Therefore, this measure was adopted in the analysis.

#### 3.3.3. Internal integrative dynamic capabilities

Measuring dynamic capabilities in SMEs is challenging, as SMEs often do not have formal policies and processes in place (Darcy et al., 2014). Therefore, researchers have measured dynamic capabilities in SMEs by looking at their resulting informal processes and

outcomes (Borch and Madsen, 2007; Dangelico et al., 2017). In line with this, internal integrative dynamic capabilities were measured in this survey using the generic measure of employee integration as used by Den Hartog et al. (2007). This measure addressed employee behaviour related to their integration with other employees. Following the prompt 'Employees in this organization are willing to ...', the items included: (1) 'Assist new colleagues to adjust to the work environment', (2) 'Help colleagues solve work-related problems', (3) 'Cover work assignments for colleagues when needed' and (4) 'Coordinate and communicate with colleagues' ( $\alpha = 0.83$ ). Owners/managers responded to these items on a five-point Likert scale ranging from 1 = 'Totally correct' to 5 = 'Totally incorrect'.

#### 3.3.4. External integrative dynamic capabilities

External integrative dynamic capabilities were measured by adapting Dangelico et al. (2017) four-item measure of dynamic capabilities for external environmental resource integration. The items were adapted to include all sustainability dimensions. Following the prompt 'Does your company take the following aspects into account?', items included: (1) 'The wishes of consumers regarding sustainability', (2) 'The knowledge of consumers about sustainability', (3) 'The knowledge and capabilities of suppliers about sustainability' and (4) 'The cooperation with other partners on sustainability' ( $\alpha = 0.88$ ). Owners/managers responded to these items on a five-point Likert scale ranging from 1 = 'Never' to 5 = 'Always'.

#### 3.3.5. Social performance

Social performance was measured using four items from Martinez-Conesa et al. (2017) measure of SME social performance in the local community. Following the prompt 'How frequently does your company engage in the following behaviours', items included: (1) 'Conducting programmes to support disadvantaged groups', (2) 'Supporting cultural and sports activities', (3) 'Taking into account the local community's interests for decision-making' and (4) 'Considering the company as part of the community and worrying about its development' ( $\alpha = 0.78$ ). Owners/managers responded to these items on a five-point Likert scale ranging from 1 = 'Never' to 5 = 'Very often'.

#### 3.3.6. Environmental performance

Environmental performance was measured using six items from Martinez-Conesa et al. (2017) measure of environmental performance in SMEs. Based on the pre-tests, the items were adapted by

simplifying the wording and changing the scale to a tick box, only allowing owners/managers to indicate whether their company engaged in the activities. Following the prompt ‘Does your company engage in the following behaviours’, items included: (1) ‘Investing in saving energy’, (2) ‘Performing environmental audits periodically’, (3) ‘Designing products and packaging to be reused, repaired and recycled’, (4) ‘Voluntarily exceeding environmental regulations’, (5) ‘Implementing programmes to reduce water consumption’ and (6) ‘Adopting measures to design ecological products or services’. The number of boxes ticked was determined to compute the score for the construct, which thus ranged between 0 and 6.

3.3.7. Economic performance

Economic performance was measured according to the firm’s average annual turnover. Owners/managers were asked to indicate the category of their average annual turnover, choosing from: ‘Less than EUR 100,000’, ‘EUR 100,001–250,000’, ‘EUR 250,001–500,000’, ‘EUR 500,001–750,000’, ‘EUR 750,001–1,000,000’, ‘EUR 1,000,001–1,500,000’, ‘EUR 1,500,001–2,500,000’ and ‘More than EUR 2,500,000’.

3.3.8. Control variables

Several sets of variables were included to control for alternative explanations of the relationships predicted in our model. First, this study controlled for the organizational size and age, industry types and family ownership. Second, the relationships between the human capital of owners/managers and the dynamic capabilities and sustainability performance of the organization were accounted for (Hambrick and Mason, 1984). This study controlled for the age, gender, education level and tenure of the owners/managers. The information on the owner/manager’s gender, organization size (the natural logarithm of the number of employees), organization age (number of years operating) and industry (agriculture, industry, building; benchmark, wholesale, recreation, business services, transportation, computers and IT, healthcare and other industries) was collected from chamber of commerce documents and corporate websites. The information for the other control variables was collected in the survey.

4. Results

The descriptive and correlation statistics for the variables are shown in Table 1.

Table 1  
Descriptive statistics and correlation matrix.

	Mean	Sd.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Perception sustainability	2.93	1.45	1.00													
2. Transformational leadership	3.94	0.46	-0.20**	1.00												
3. Internal integration	4.07	0.51	-0.04	0.35**	1.00											
4. External integration	3.63	0.82	-0.24**	0.12**	-0.02	1.00										
5. Environmental performance	3.48	1.44	-0.20**	0.10*	-0.13**	0.45**	1.00									
6. Social performance	3.12	0.79	-0.12*	0.23**	0.08	0.34**	0.29**	1.00								
7. Economic performance	5.84	2.21	-0.19**	0.19**	0.01	0.20**	0.22**	0.02	1.00							
8. Organization size <sup>b</sup>	32.40	49.30	-0.26**	0.15**	-0.05	0.15**	0.23**	0.03	0.50**	1.00						
9. Organization age	47.19	42.57	-0.10*	-0.02	-0.06	0.10*	0.23**	-0.02	0.28**	0.26**	1.00					
10. Family ownership <sup>a</sup>	0.57	0.50	0.01	-0.05	-0.00	0.19**	0.15**	0.05	0.01	-0.10*	0.18**	1.00				
11. Gender <sup>a</sup>	0.13	0.33	0.01	-0.14**	-0.14**	0.04	-0.00	0.11*	-0.13**	-0.07	-0.14**	-0.10*	1.00			
12. Age	50.65	9.53	0.07	-0.10	-0.10	-0.01	-0.07	-0.16**	-0.04	0.05	0.07	-0.03	0.19**	1.00		
13. Education <sup>a</sup>	3.68	0.90	-0.09	0.03	-0.03	-0.03	-0.02	0.02	0.21**	0.22**	-0.06	-0.21**	0.01	-0.14**	1.00	
14. Tenure	19.44	10.99	0.05	-0.07	-0.07	-0.03	-0.04	-0.08	-0.08	-0.13**	0.19**	0.27**	-0.11**	0.52**	-0.33**	1.00

N = 297.

\* p < 0.1, \*\* p < 0.05.

<sup>a</sup> Dummy variable.

<sup>b</sup> The natural logarithm is used in correlations, but the actual values are reported in the descriptive information.

The theoretical model was tested using structural equation modelling techniques (SEM) by applying AMOS graphics 7.0 (Byrne, 2016; Dangelico et al., 2017). The structural model provided a good fit to the data (with  $\chi^2(12) = 35.94$ , CFI = 0.96, RMSEA = 0.08, NFI = 0.95, and SRMR = 0.03). A summary of the standardized structural equation modelling results is presented in Table 2 and Fig. 2. A discussion of the main findings follows (with significant control variables in line with expectations).

Hypothesis 1 predicted that external integrative dynamic capabilities positively relate to the social, environmental and economic performance of an SME. Fig. 2 shows that this hypothesis was supported—the path coefficient from external integrative dynamic capabilities to social performance was positive and significant ( $\beta = 0.34$ ,  $p < 0.01$ ), as were the path coefficient to economic performance ( $\beta = 0.12$ ,  $p < 0.01$ ) and the path coefficient to environmental performance ( $\beta = 0.39$ ,  $p < 0.01$ ).

Hypothesis 2 predicted that internal integrative dynamic capabilities positively relate to the social, environmental and economic performance of an SME. Fig. 2 shows that this hypothesis was not supported—the path coefficients from internal integrative dynamic capabilities to social performance ( $\beta = 0.08$ , ns) and economic performance ( $\beta = 0.01$ , ns) were insignificant, while the path coefficient to environmental performance was significant but negative ( $\beta = -0.12$ ,  $p = 0.02$ ). Thus, internal integrative dynamic capabilities did not positively relate to the social, economic and environmental performance of the firms.

Hypotheses 3 and 4 focused on the owner/manager’s transformational leadership and perceptions of sustainability. Hypothesis 3 predicted that transformational leadership positively relates to internal integrative dynamic capabilities. Hypothesis 4 predicted that the owner/manager’s perception of sustainability as a threat negatively relates to external integrative dynamic capabilities. Fig. 2 shows that both hypotheses were supported—the path coefficient from transformational leadership to internal integrative dynamic capabilities was positive and significant ( $\beta = 0.37$ ,  $p < 0.01$ ), and the path coefficient from the owner/manager’s perception of sustainability as a threat to external integrative dynamic capabilities was significant and negative ( $\beta = -0.31$ ,  $p < 0.01$ ).

4.1. Alternative model specification

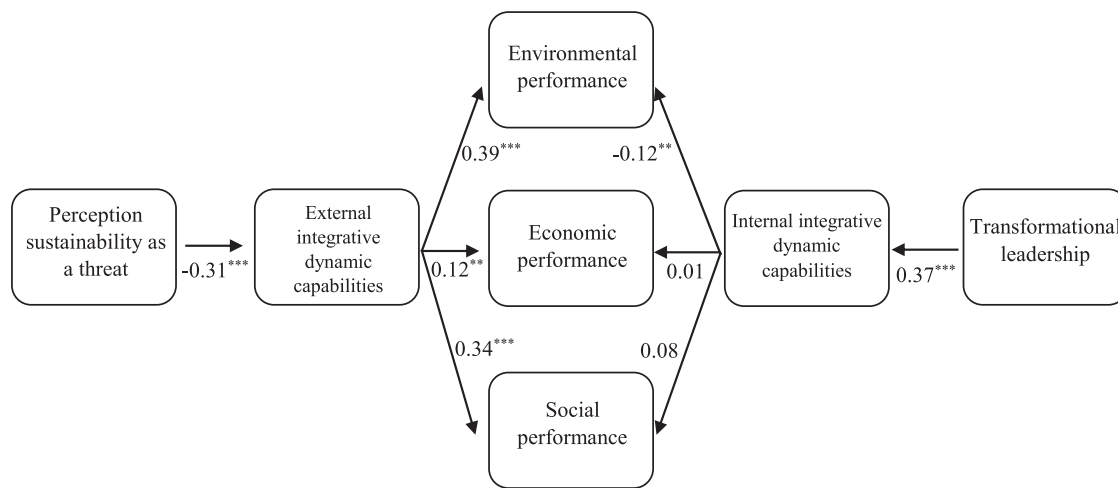
Theories concerning the social, environmental and economic performance of SMEs suggest that there might be direct

**Table 2**  
Summary of the study results.

		Internal Integration	External Integration	Social perf.	Environ. Perf.	Economic perf.
Control Variables	Organizational size	-0.10	0.11	0.03	0.12**	0.45***
	Organizational age	-0.01*	0.01	-0.00	0.00**	0.00***
	Family <sup>a</sup>	-0.04	0.42***	0.01	0.06	-0.03
	Gender <sup>a</sup>	-0.52***	0.23	0.25	-0.06	-0.28*
	Tenure	0.00	-0.01*	0.00	-0.01	0.00
	Age	-0.01*	0.01	-0.02**	-0.01	-0.01
	Education <sup>a</sup>	-0.07	-0.07	0.00	-0.00	0.18***
	Industry <sup>a</sup>	-0.01	-0.00	-0.03*	-0.07***	-0.05***
Independent Variables	Interpretation		-0.31***			
	Transformational	0.37***		0.08	-0.12**	0.01
	Internal integration			0.34***	0.39***	0.12**

\* p < 0.1, \*\*p < 0.05, \*\*\* p < 0.01.

<sup>a</sup> Dummy variable.



<sup>a</sup> path coefficients are standardized  
<sup>b</sup> control variables are included on all dependent variables  
 \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01

**Fig. 2.** Summary of the study results <sup>a b</sup>.

relationships between the characteristics of the owner/manager and the performance outcomes of SMEs (Hambrick and Mason, 1984). The role of the owner/manager is expected to be crucial in SMEs, as he or she must constantly evaluate whether firm resources and capabilities continue to add value despite changes in the external environment (Zahra et al., 2006). These direct relationships were not formally hypothesized because this study aimed to analyse the indirect effects of the owner/manager on SME performance via their ability to drive dynamic capabilities. Including the direct relationships between leadership characteristics and sustainability performance in the previous model slightly improved the model fit (with  $\chi^2(6) = 18.97$ , CFI = 0.98, RMSEA = 0.08, NFI = 0.98, SRMR = 0.02). A summary of the standardized structural equation modelling results is presented in Fig. 3.

Similar results regarding the hypotheses were found. Additionally, the results indicated that the path coefficients from transformational leadership to social ( $\beta = 0.17$ ,  $p < 0.01$ ) and economic performance ( $\beta = 0.10$ ,  $p = 0.06$ ) were positive and significant, while the path coefficient to environmental performance was insignificant ( $\beta = 0.06$ , ns). The path coefficient from the owner/manager's perception of sustainability as a threat to environmental performance was negative and significant ( $\beta = -0.10$ ,  $p = 0.05$ ),

while the path coefficients to social ( $\beta = -0.01$ , ns) and economic performance ( $\beta = 0.02$ , ns) were both insignificant.

4.2. Robustness tests

Several additional analyses were performed to test for robustness. First, the model was estimated using an ordinary least squares (OLS) estimation approach. Three separate models for social, environmental and economic performance were estimated, including owner/manager characteristics and dynamic capabilities as independent variables. The results showed that the corresponding OLS estimation did not differ from the SEM estimates either in terms and signs or in significance of the estimated parameter coefficients.

Second, whether the results remained robust for an alternative measure of the owner/manager's perception of sustainability was tested. The analysis was repeated using only one item: 'I am likely to lose rather than gain by actions related to sustainability', which did not affect the SEM results.

Third, the possibility of non-linear relationships between the variables of interest was investigated. There might have been non-linear relationships, for example, because a focus on external



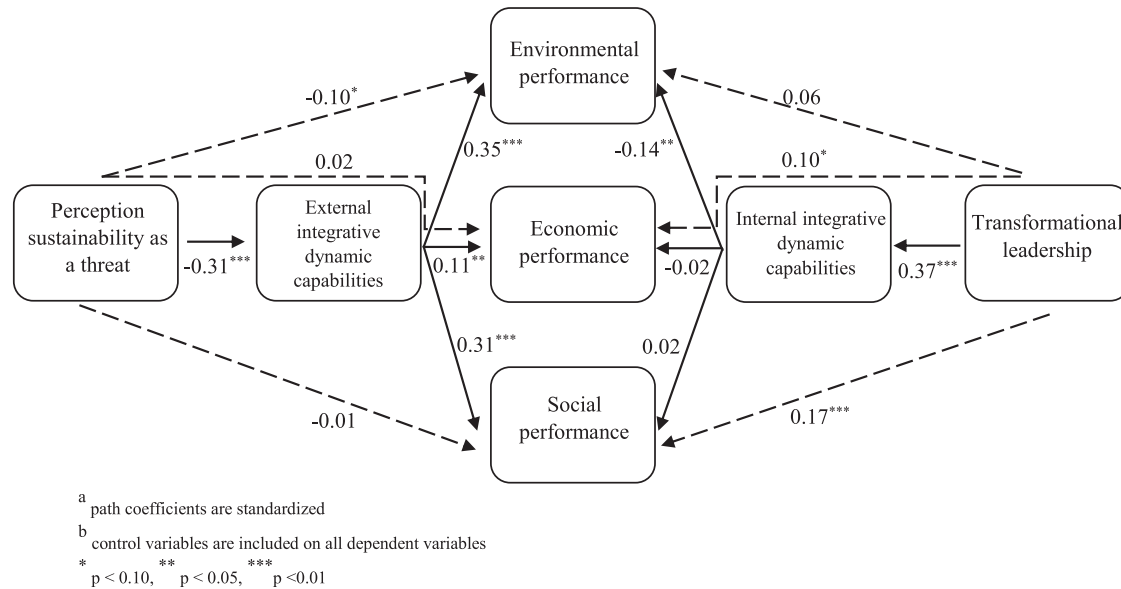


Fig. 3. Summary of the study results with the alternative model specification <sup>a b</sup>.

integration may, at a certain point, result in a negative influence on economic performance due to the amount of effort and costs required for SMEs to maintain these processes. The estimation results for this robustness test did not indicate any statistically significant non-linear relationships.

## 5. Discussion

If they are to contribute to the sustainable development of the planet, SMEs must find approaches that simultaneously drive social, environmental and economic performance (Moore and Manring, 2009). This study investigated the relationship between dynamic capabilities and the sustainability performance of SMEs. The results advance the debate about SME sustainability in significant ways.

First, this research addressed the debate in recent sustainability literature regarding the ability or inability of SMEs to implement social, environmental and economic objectives (Aragon-Correa et al., 2008; Dyllick and Hockerts, 2002; Hockerts and Wüstenhagen, 2010). The study is among the first to construct a framework that includes these environmental, social and economic aspects of SME performance, extending current research by addressing whether and how SMEs might develop the necessary capabilities to simultaneously drive the three aspects of performance. This study indicated, theoretically and empirically, that external integrative dynamic capabilities positively relate to all three dimensions of sustainability performance in SMEs. This finding provides an important rationale for how SMEs might overcome barriers to the implementation of sustainability by developing appropriate organizational capabilities and advances current research (e.g., Biondi and Iraldo, 2002; Johnson and Schaltegger, 2016; Seidel et al., 2009) by revealing that even resource-constrained SMEs can simultaneously address the three pillars of sustainability.

Second, in contrast to the positive relationship found between external integrative dynamic capabilities and sustainability performance, the results indicated an insignificant relationship between internal integrative dynamic capabilities and the social and economic performance of SMEs. The results even showed a negative relationship between internal integrative dynamic capabilities

and the environmental performance of the SMEs, contradicting the corresponding hypothesis. The effects that were found are intriguing, especially considering the dominant view in the literature that employee cooperation and trust are important drivers of sustainability (Inigo et al., 2017). However, there is a potential explanation for the findings. Previous research has shown that embracing sustainability requires major innovation and often demands the transformation of the entire method of operation (Eccles and Serafeim, 2013). High levels of internal integration among employees may not increase the ability of the company to make substantial changes and move towards sustainability, as employees may be reluctant to change and show limited out-of-the-box thinking (Morrison, 2011). High levels of internal integration dynamic capabilities may even lead to lower environmental performance, as environmental performance is often less directly tied to SME legitimacy and competitive advantages (Simpson et al., 2004). Therefore, environmental performance might be included less often in the mindset of employees and managers, which means that to contribute to environmental performance, employees must be able to deviate from the conventional mindset and share new ideas. For instance, it has been suggested that to contribute effectively to environmental action, employees must be able to think individually and operate freely and independently (Daily et al., 2007). A high level of internal integration dynamic capabilities may limit this ability of employees (Morrison, 2011) and potentially cause a 'competency trap' in which the organization becomes better at conventional processes without developing the necessary processes for environmental performance (Tallman, 2003). These findings add value to the sustainability literature (e.g., Daily and Huang, 2001; Inigo et al., 2017) by highlighting the ambiguous role of stand-alone internal integration processes in relation to sustainability performance. In contrast to the conclusions drawn by Arend (2014), the results of the present study imply that general dynamic capabilities alone may not be sufficient to simultaneously drive economic, social and environmental performance in SMEs.

Third, this study contributes to the sustainability and dynamic capabilities literature by offering a fine-grained and nuanced theoretical framework. While some scholars have addressed dynamic capabilities for sustainability in SMEs (Arend, 2014), there has not been much discussion about which types of dynamic

capabilities might be particularly useful in specific situations faced by SMEs (Bos-Brouwers, 2010). The findings of this study further develop previously adopted frameworks (e.g., Arend, 2014; Marcus and Anderson, 2006) by revealing that integrative dynamic capabilities, in particular, are important for sustainability performance in SMEs. The results of the present study showed that SMEs possessing external integrative dynamic capabilities had an important advantage in relation to sustainability performance, while possessing internal integrative dynamic capabilities did not provide such an advantage. These results highlight that different types of dynamic capabilities have different effects on sustainability performance in SMEs, supporting the need for a nuanced framework.

Fourth, this paper further adds to the sustainability and leadership literature (e.g., Patzelt & Shepherd, 2011; Revell et al., 2010) by investigating the indirect and direct roles of owners/managers in the sustainability performance of SMEs. Some researchers have argued that the capabilities, values and attitudes of owners/managers are highly influential factors in determining whether SMEs embrace environmental and social practices (Perez-Sanchez et al., 2003). However, other researchers have found that the generally positive attributes of owners/managers rarely translate into concrete sustainability efforts (Revell et al., 2010). This study is among the first to develop and test, in detail, the direct and indirect links between owners/managers and all three pillars of sustainability performance in SMEs. It was found that while managerial attributes may not always be directly linked to all three pillars of sustainability in SMEs, there are indirect links through dynamic capabilities. These findings highlight the indirect influence of owner/managers on all three pillars of sustainability performance in SMEs.

### 5.1. Managerial implications

This study provides valuable information to SMEs that wish to address their sustainability performance. First, SMEs must realize that they can address all three pillars of sustainability (Aragon-Correa et al., 2008) by fostering similar capabilities. This study takes a first step in this direction by showing that all three pillars of sustainability performance can benefit from processes that integrate the sustainability knowledge of suppliers, customers and other external partners. Given the important role of dynamic capabilities, SMEs should intentionally build and enhance their dynamic capabilities to drive their sustainability performance (Arend, 2014).

Second, this study showed that SMEs may need to extend their view beyond internal processes to enhance their sustainability performance. Solely addressing internal policies and employees may not be sufficient to address all three pillars of sustainability. Therefore, SMEs need to integrate their suppliers, local communities and customers into their approaches to sustainability (Klewitz and Hansen, 2014). Furthermore, this study showed that general processes that integrate employees are not sufficient to drive sustainability performance. When translated into a sustainability context, such integrative processes may offer important advantages. SMEs aiming to increase their sustainability performance may thus largely benefit from re-evaluating their dynamic capabilities in light of sustainability.

Third, SMEs and governments must understand the importance of owners/managers in fostering sustainability performance. Even when direct impacts seem absent, owners/managers may have important indirect effects on the sustainability performance of their organizations. SMEs transitioning towards sustainability should start by evaluating their leadership. Governmental programmes aiming to increase the sustainability performance of SMEs might invest in training programmes for corporate leaders to increase their sustainability knowledge.

### 5.2. Limitations and future research

There were several limitations within this study, which point to potential areas for future research. First, the measures used were constrained by the information that could be obtained from the survey. Driven by previous research, this study relied on outcome measures for the internal and external integrative dynamic capabilities of the SMEs. Although the measures offered unique data about the dynamic capabilities of the SMEs, there were still trade-offs. Other possible methods, such as qualitative analysis, might offer more nuance in the measurement of dynamic capabilities. The measurements used are a potential limitation of this study, but nonetheless, the data are both unique and relevant to the research aim of this paper.

Another issue pertains to the sample adopted in this research. This study focused on a selection of firms that conformed to the selection criteria with regard to location, size and ownership. Future research could increase the sample size and include multiple countries, cultures and industry effects. This study offered points of departure for studies on the dynamic capabilities for sustainability performance in other contexts.

Third, the data for this study was constrained by the time frame, which may have caused endogeneity. This study relied on the strategic management perspective on dynamic capabilities (Zahra et al., 2006) to support the hypotheses and results. Nonetheless, the relationships found may have been strengthened or weakened by including multiple points in time. Additional research is needed to take into account the developments in sustainability performance and the long-term effects of dynamic capabilities using longitudinal data.

Fourth, driven by theory, this study focused on dynamic capabilities and sustainability performance, adopting a meta-level view of the organization. The relationships found may have been strengthened or weakened by including more specific processes such as innovation or other organizational factors. Additional research is needed to take into consideration the dynamics of organizational capabilities and sustainability performance. Furthermore, future research could translate owner/manager characteristics into a sustainability context, investigating, for instance, the effects of sustainability leadership on the sustainability performance of SMEs.

## 6. Conclusion

This study addressed the debate in the recent sustainability literature concerning the ability/inability of SMEs to incorporate social, environmental and economic goals. Due to the conflicting nature of these goals and resource constraints, SMEs may not be able to simultaneously address all three pillars of sustainability performance. By contrast, recent evidence has suggested that SMEs can act as drivers of all three pillars of sustainability performance. The contribution of this study is that it investigated whether and how SMEs can overcome their resource constraints and develop the necessary capabilities to simultaneously drive social, environmental and economic performance. This study theoretically advanced the sustainability literature by presenting new hypotheses and applying insights from the dynamic capabilities perspective. Evidence was found of a positive relationship between external integrative dynamic capabilities and all three pillars of sustainability performance in SMEs.

### Conflicts of interest

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this

article.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2019.07.013>.

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