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The link of environmental and economic performance: Drivers and limitations of sustainability integration

Marcus Wagner *

Augsburg University, Universitätsstr. 16, 86159 Augsburg, Germany

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ABSTRACT

Combining stakeholder, resource based and institutional theories suggests that stakeholder demands affect the environmental and social activities of firms, which in turn influence various performance aspects. This paper tests if stakeholder demands are related to the integration of management activities within the firm, and if such integration is positively associated with economic and environmental performance dimensions, where especially for the latter empirical evidence is scarce and inconsistent. To address this gap, data from the manufacturing sector is used for analysing how stakeholder types associate with sustainability integration and economic and environmental performance. The analysis reveals better fit for a moderated structural equation model than a model with direct links between economic and environmental performance and shows that environmental performance is decoupled from integration. These findings suggest that resource based reasoning could be self-limiting in jointly improving environmental and economic performance.

1. Introduction

Organisational analysis has increasingly focused on corporate sustainability management in recent years (Lindgreen, Swaen, & Johnston, 2009; Scherer & Palazzo, 2011). In the field of environmental management, the "pays-to-be-green" debate has attracted considerable attention (Ambec & Lanoie, 2008; McGuire, Sundgren, & Schneeweis, 1988; Orlitzky, Schmidt, & Rynes, 2003) and corporate social responsibility has similarly become a major issue for firms (Graafland, van de Ven, & Stoffele, 2003; Jamali, 2008; Kolk & Pinkse, 2006; Smith, 2003) as have business ethics in the context of the current financial crisis. Notions of "green-/bluewashing" are juxtaposed with theories proposing the development of competitively useful capabilities that also benefit the environment and society, especially as concerns multinational corporations (Clarke, 2001; Marcus & Anderson, 2006). The paper contributes to this debate by empirically testing theories about how firms can simultaneously improve environmental and economic performance. In doing so it provides generalizable insights that help managers to design well-informed sustainable strategies and contributes to a more encompassing model. It also helps academics to focus future research and addresses calls for more comprehensive theories of sustainability management (Starik & Kanashiro, 2013).

The importance of the manufacturing sector and its products has often been emphasized (Jackson, 1996). The negative impacts of the sector have increased due to continuing globalisation and multinational firms in particular often face demands from stakeholders to reduce environmental impact (Banerjee, 2002).

If stakeholder demands affect firms' conduct, they should also relate to their economic performance, at least according the structure-conduct-performance paradigm (Berman & Wicks, 1999; McWilliams, Siegel, & Wright, 2006). At the same time, given that organisational actions cover a wide spectrum from lobbying activities to the implementation of environmental management systems and environmental technologies, a positive relationship between activities aimed at corporate sustainability and environmental performance (i.e., reduced environmental impacts and by analogy also social performance) seems a less certain outcome of stakeholder demands towards firms. This prompts questions about how firms can sustain, in parallel to their business interests, their efforts to protect public goods in the long term.

Specific gaps in the literature that emerge from these considerations and which the paper addresses are whether integration of sustainability with other areas of firm action benefits economic performance and environmental performance. Especially for the latter, empirical evidence is scarce (Florida & Davidson, 2001; Hertin, Berkhout, Wagner, & Tyteca, 2008; Potoski & Prakash, 2005; Thornton, Kagan, & Gunningham, 2003) and this could be a major impediment to maintaining current and developing further corporate sustainability efforts in private firms.

Three theories are frequently invoked in framing the response of firms to stakeholder demands to reduce their environmental impact: stakeholder theory, institutional theory and the (natural) resource based view. These can inform the link between stakeholder demands and a firm's environmental activities. Furthermore in combination,

* Bureau d'Economie Théorique et Appliquée (BETA). Tel.: +49 821 598 4079; fax: +49 821 598 4220.
E-mail address: marcus.wagner@wiwi.uni-augsburg.de.

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these theories lead to a more general model that helps to explain how stakeholder demands can lead to the integration of environmental activities into the wider functions of organisations and to changes in economic and environmental performance.

The next two sections first introduce relevant theories that have motivated the structural model and then develop hypotheses. This is followed by a section on data and methodology and the results section. The final section draws conclusions and offers a discussion of them.

1.1. Literature review

Stakeholder demands, organisational activity and performance outcomes can be linked through different theoretical mechanisms (Davis, 2006; Jones, Felps, & Bigley, 2007) with one important base theory for this analysis being stakeholder theory which asserts that stakeholder demands are an important motivating factor for the environmental and societal activities of firms (Freeman, Harrison, Wicks, Parmar, & DeColle, 2013; Henriques & Sadorsky, 1999; Johnstone, 2007). Various studies have explored this relationship (Delmas & Toffel, 2008; Kassinis & Vafeas, 2006; Rueda-Manzanares, Aragon-Correa, & Sharma, 2008) and stakeholder theory can help to classify demands more systematically, for example, as originating either from within the firm or beyond it in the value chain or the public domain (Clarkson, 1995; Doh & Guay, 2006; Donaldson & Preston, 1995; Frooman, 1999).

As a second important conceptual base, institutional theory predicts the adoption of firm specific activities as a consequence of demands by stakeholders that represent the institutional context of a firm (DiMaggio & Powell, 1983; Etzion, 2007; Meyer & Rowan, 1977; Oliver, 1991). Increasingly, such firm-external demands relate to the way firms deal with the natural environment and social issues and as a result firms address such demands more (Bansal & Clelland, 2004; Hoffman, 1999; Hoffman & Ventresca, 1999; Rothenberg, 2007). Thus, in the context of institutional theory, environmental activities and corporate sustainability management generally are often seen as ceremonial activities which build on asymmetric information and are aimed at addressing stakeholder concerns, with or without changes in the actual performance of firms (Hoffman, 2005; Husted & Allen, 2006; Marquis, Zhang, & Zhou, 2011; McWilliams et al., 2006).

A third important theory that has gained increasing prominence in recent years for corporate sustainability is the (natural) resource based view (Aragon-Correa & Sharma, 2003; Barney, 1991; Hart, 1995; Hart & Dowell, 2011; Menguc & Ozanne, 2005; Wernerfelt, 1984) which provides scholars with yet another perspective linking stakeholders, activities and performance. It relays to the context of environmental and social sustainability the idea that "resources are firm-specific assets that are difficult if not impossible to imitate. […] Such assets are difficult to transfer among firms because of transaction costs, and because the assets may contain tacit knowledge" (Teece, Pisano, & Schuen, 1997, p. 516). More specifically, Hart (1995) and Aragon-Correa and Sharma (2003) developed three interrelated strategies for improving the environmental performance of firms which to enable sustained competitive advantage.

The three theories presented above jointly provide an overarching theoretical framework that links stakeholder demands, firm behaviour and environmental as well as economic outcomes in a structure-conduct-performance notion (Oliver, 1997), as is graphically displayed in the following Fig. 1.

This relates to a longstanding debate on the social issues in the literature on management and organisations and the natural environment, namely the empirical "pays-to-be-green" literature, which in turn connects to the strategic management literature in general. Margolis and Walsh (2001, 2003), Orlitzky et al. (2003) and Ambec and Lanoie (2008) as well as Molina-Azorín, Claver-Cortés, López-Gamero, and Tarí (2009a, 2009b), Horváthová (2012) and Dixon-Fowler, Slater, Johnson, Ellstrand, and Romi (2013) provide recent reviews and meta-studies summarising the empirical work on the relationship of

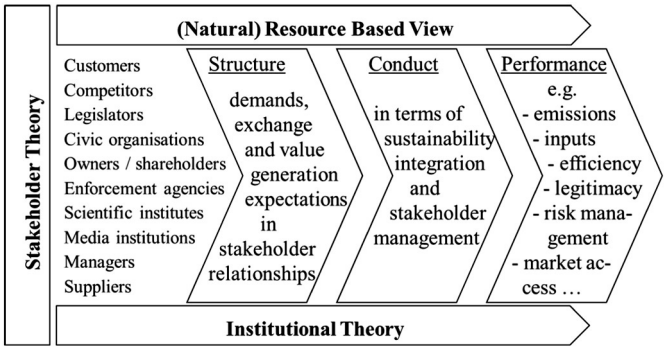

Fig. 1. Graphical representation of the theoretical framework.

environmental and social performance to economic performance. These reveal considerable variation across individual studies, ranging from negative to non-significant to moderately (or even strongly) positive relationships and similar findings apply to social performance. Orlitzky (2011) further finds that institutional logics have a systematic effect on the average relationship across different management sub-disciplines.

These studies suggest that combining both the aforementioned theories might generate a comprehensive structural model linking stakeholder demands (i.e. firm-exogenous structures), conduct (e.g., in terms of environmental or social management activities such as stakeholder integration) and performance (environmental and economic) that provides a sound basis for empirical analysis. Specifically, Judge and Douglas (1998) show that integration of environmental issues relates positively to performance, suggesting integration is a capability. Integration is at the same time determined by demands arising from outside the firm – as reflected by the different stakeholder domains – and this suggests it is an indispensable mediator variable between stakeholder demands and performance dimensions in light of empirically observed heterogeneity of performance across firms. Given that integration across corporate functions and the integration of sustainability with administrative (e.g. health and safety, abbreviated H&S in the following), engineering (e.g. quality) and entrepreneurial (i.e. corporate strategy) aspects of the firm have been identified as crucial elements of a proactive environmental strategy, it can be understood as a capability (Aragon-Correa & Sharma, 2003; Hart, 1995).

Sustainability integration understood this way ensures the alignment of environmental with other strategic objectives to ensure that activities or projects are not in conflict or that at least conflicts are minimized. Based on this it is operationalized by three indicators assessing the degree to which environmental management is integrated with quality management, H&S aspects, and corporate strategy. Given the theoretical considerations above and the arguments made in the literature about stages of corporate sustainability strategies (Benn & Probert, 2006; Hart, 1995; Hunt & Auster, 1990; Matias & Coelho, 2002; Rahimi, 1995; Sharma & Vredenburg, 1998) this is considered suitable to model integration as a continuous variable. Furthermore, given the link between integration and proactivity, the relationship with stakeholder demands in the structural model can be assumed to be the same as in Murillo-Luna, Garces-Ayerbe, and Rivera-Torres (2008).

The role of integration in managing for stakeholders in order to improve value creation and transfer is directly addressed with a novel integration construct in this research that also captures the simultaneous influence of stakeholders. Firms that manage for stakeholders by allocating more resources to meet expectations and requirements of stakeholders develop fair and just relationships (Bosse, Phillips, & Harrison, 2009; Freeman et al., 2013). According to the resource-based logic, with such relationships stakeholders are willing to share more and qualitatively better information which in turn enables the firm to increase revenues and profits, be more innovative and better able to

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react to changes in the business environment (Harrison, Bosse, & Phillips, 2010; Sisodia, Wolfe, & Sheth, 2007). Ultimately, this enables firms better to concentrate on stakeholder interests and relationships rather than market transactions and therefore also to contribute to joint value creation (Freeman, Harrison, & Wicks, 2007; Parmar et al., 2010).

Also in this context Hart (1995) as well as Sharma and Vredenburg (1998) introduced stakeholder integration as a capability to integrate economic and political strategy making. This further clarifies that linkages exist between the different theories outlined earlier in that for example stakeholder demands and resulting relationships guide firms in the creation of strategic resources from which a competitive advantages derive in a resource based logic (Parmar et al., 2010; Priem & Butler, 2001). The integrative strategic management process resulting from this supports the integration thesis (Freeman, 1984, 1994; Harris & Freeman, 2008). This enables sense-making to maximise value creation for stakeholders without trading off (Freeman et al., 2013) and also to gain deeper understanding of stakeholders, as a precursor for the development of proactive environmental activities such as product stewardship (De Luque, Washburn, Waldman, & House, 2008; Henriques & Sadorsky, 1999; Pujari, Wright, & Peattie, 2003), and justifies sustainability integration as a central concept of this research.

1.2. Hypothesis development

In developing hypotheses, the current research initially addresses the relationship between stakeholder demands and the integration of environmental activities with other corporate functions and strategic aspects. It then addresses the link between integration and economic and environmental performance as is indicated in Fig. 1 above.

1.3. The link between stakeholder demands and integration of environmental activities

Before examining the link between stakeholder demands and the integration of environmental activities, examination of the various stakeholder typologies proposed in prior literature is warranted. For example, Buysse and Verbeke (2003) derive four categories from 14 individual stakeholders, namely internal and external primary stakeholders, secondary and regulatory stakeholders. Similarly, Murillo-Luna et al. (2008) identify five categories for 14 individual stakeholders. These are internal and external economic stakeholders, corporate government and regulatory stakeholders and external social stakeholders. Finally, Henriques and Sadorsky (1999) based on 12 individual stakeholders identify four categories, namely community stakeholders. They overlap with, but are not identical to, those of the earlier two studies, and are: corporate government stakeholders, organisational stakeholders, regulatory stakeholders and mass media Overlaying the three classifications produces four broadly similar stakeholder categories, that can be termed internal stakeholders, regulatory stakeholders, value chain stakeholders and public stakeholders that are also reflected in recent reviews and syntheses (Parmar et al., 2010). For these categories hypotheses are derived in the following.

1.3.1. Internal stakeholders

Sustainability management with limited linkages (e.g. in terms of personnel or organisational structures or processes) to corporate strategy or other management systems such as quality or health and safety leads to inefficient redundancy in corporate functions (Sharma & Henriques, 2005). From this, low economic efficiency follows (resulting e.g. from avoidable coordination efforts), which is not in the interest of internal stakeholders (Greenley & Foxall, 1996; Oktem, Lewis, Donovan, Hagan, & Pace, 2004). Furthermore, benefits from integration of internal management systems such as quality and environmental management, social aspects and H&S exist. This is due to similar structures of management standards such as ISO 9001, ISO 14001 or SA 8000 and because of scale economies and complementarities which ultimately lead to higher effectiveness (Matias & Coelho, 2002; Rahimi, 1995). Based on these considerations, the following hypothesis can be proposed:

H1. *Internal stakeholder demands positively associate with the level of integration of environmental considerations within the firm.*

1.3.2. Regulatory stakeholders

Increasingly stringent environmental regulation necessitates more proactive and ultimately costly corporate sustainability initiatives (Buysse & Verbeke, 2003; Reinhardt, Stavins, & Vietor, 2008). As is witnessed by the definitions and criteria used in Murillo-Luna et al. (2008), higher proactivity implies more integration. Also integration supports a joint approach to achieving compliance with environmental, quality and H&S regulations and in doing so leads to lower overall compliance cost, for a given level of regulatory demands (Palmer, Oates, & Portney, 1995). Given that regulatory stakeholders (and in this case especially national and European legislators) have increasingly more powers and means to disrupt the normal operations of a firm, for example by means of penalties, phase-outs and other restrictions, integration can contribute by significantly reducing any avoidable risks in this respect (Barnett, 2007; Henriques & Sadorsky, 1999). Hence the following hypothesis can be proposed:

H2. *Regulatory stakeholder demands associate positively with the level of integration of environmental considerations within the firm.*

1.3.3. Value chain stakeholders

Supply chains as a whole are under increasing demand to improve their overall social and environmental performance beyond a piecemeal optimisation approach that shifts environmental or social issues from one stage of the supply chain to another, rather than eliminating them and their root causes completely (Azzone, Brophy, Noci, Welford, & Young, 1997; Boyd, Spekman, Kamauff, & Werhane, 2007). The resulting need for integrated supply chains fosters firm-level integration because the higher such integration, the higher the potential and likelihood to achieve complete issue elimination (Hall & Martin, 2005). Integration also leads to higher control and accountability along the supply chain which is in the interest of supply chain stakeholders, especially in the context of increasing public institution and private firm efforts for monitoring firm behaviour (O'Rourke, 2006; Parmigiani, Klassen, & Russo, 2011). Based on these considerations, the following hypothesis can be proposed:

H3. *Value chain stakeholder demands associate positively with the level of integration of environmental considerations within the firm.*

1.3.4. Public stakeholders

Stakeholder theory suggests an association of demands from public stakeholders with integration given that particularly this category of stakeholders influences the development of environmental activities in the firm (De Madariaga & Valor, 2007; Howard-Grenville & Hoffman, 2003; Jamali, 2008). Specifically, it has been argued that the general public expects firms to contribute to enhanced quality of life (Hill & Jones, 1992). This implies tighter integration of sustainability topics within and across all corporate activities to avoid negative side effects and also to create legitimacy. For example, in the context of product development, integrated consideration of all sustainability dimensions can help to avoid product liability issues later on. Also, Hall and Martin (2005) maintain, that public stakeholders have a particularly high potential for disrupting a firm's operations. Based on these considerations, the following hypothesis can be proposed:

H4. *Public stakeholder demands associate positively with the level of integration of environmental considerations within the firm.*

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1.3.5. The link between integration and performance dimensions

The above arguments imply that integration mediates firm-external and firm-internal dimensions. This specifically applies to stakeholder and performance categories, since without mediation the assumption would be that stakeholder demands uniformly relate to the economic and environmental performance of firms. Such a "hard-wired" link of stakeholders and performance would however be inconsistent with the structure-conduct-performance paradigm and especially with the heterogeneous resource endowments and capabilities of firms that can be observed in reality (Aragon-Correa, Matias-Reche, & Senise-Barrio, 2003; Aragon-Correa & Sharma, 2003; Fryxell & Vryza, 1998).

Another reason for viewing integration as an indispensable mediating variable in the theoretical framework outlined earlier is, that -as detailed in the literature review- there is no clear empirical link of environmental and economic performance, implying the existence a third variable simultaneously influencing in a firm-specific manner environmental and economic performance (Garcia-Castro, Arino, & Canela, 2009) and integration (i.e., the coupling and cross-functional coordination of environmental management aspects with other managerial tasks and activities) has been proposed to be such a variable (Christmann, 2000; Jansson, Nilsson, & Rapp, 2000).

1.3.6. The link between integration and economic performance

The (natural) resource based view holds that sustainability integration is achieved through a process based on tacit capabilities which are difficult to imitate (e.g., quality management activities or corporate strategy development) turning integration into a strategic resource (Aragon-Correa & Sharma, 2003; Branco & Rodriguez, 2006; Claver, Lopez, Molina, & Tari, 2007; Hart, 1995). In line with this, Judge and Douglas (1998) and Molina-Azorín et al. (2009b) show that the integration of environmental issues relates positively to economic performance and thus also support the notion of organisational idiosyncrasies in the case of integration. Therefore, firms that increase integration can realise competitive advantages and improved performance in a variety of economic performance dimensions, such as risk, image, efficiency or market performance (Husted, 2005; Belz & Peattie, 2009; Godfrey, Merrill, & Hansen, 2009: Hart and Dowell, 2011). Based on these considerations, the following hypotheses can be proposed:

H5. *The level of integration of environmental considerations within the firm associates positively with economic performance.*

1.3.7. The link between integration and environmental performance

Judge and Douglas (1998) show that sustainability integration also associates positively to environmental performance, implying that firms who voluntarily engage in increasing integration beyond the minimum levels legally mandated show an improvement of environmental performance (for example in terms of lower resource inputs or emissions). Similarly, Claver et al. (2007) as well as Molina-Azorín et al. (2009b) identify positive performance effects from the integration of quality management and environmental aspects which can be understood as a precedent to more comprehensive integration. Also, Christmann (2000) argues that firms can reduce negative environmental externalities by means of best practices in environmental management.

Yet, as discussed above empirical evidence for improved environmental performance from corporate sustainability integration is comparatively limited (Hertin et al., 2008; Potoski & Prakash, 2005). Consistent with this institutional theory holds that such activities are often ceremonial and aimed at green-/blue-washing (Solomon & Darby, 2005). Also, Husted and Allen (2006) argue that institutional isomorphism (rather than stakeholder-driven sustainability integration) reduces the environmental effectiveness of corporate sustainability initiatives and risks that the strategically most relevant sustainability challenges remain unaddressed. As a result, two competing hypotheses can be formulated as concerns the link of integration and different (e.g. input- or output/emissions-related) environmental performance aspects.

H6a. *The level of integration of environmental considerations within the firm associates positively with different dimensions or environmental performance, or*:

H6b. *The level of integration of environmental considerations within the firm associates negatively or non-significantly with different dimensions of environmental performance.*

2. Data and method

2.1. Sample description

The following empirical analysis is based on Dutch and German data collected through a survey on the state of environmental management in manufacturing firms.[1] The two countries were chosen due to the close proximity of both countries which makes spillovers of environmental and social management practices easier and thus more likely and because they had the highest response rates (which increase the validity, reliability and generalizability of any results). Also, other research (Sharma, 2001) has shown that even in non-identical environmental regulatory regimes firms adopt similar environmental strategies and experience the same competitiveness effects of these.

The focus on manufacturing firms was because they have high environmental relevance which, as was explained in the introduction, makes this population of firms also more prone to stakeholder demands. Therefore, any links can be better studied and the above hypotheses better tested with manufacturing firms than e.g. with service firms.

Data was collected with a postal questionnaire which asked firms to assess their environmental impacts and stakeholder demands. It also asked the respondents to report their effects on different aspects of economic performance in relation to environmental management, as well as general characteristics. Surveying firms this way was additionally deemed appropriate since prior research shows that managerial perceptions on the areas above topics produce valid measurements (Dess & Robinson, 1984; Murillo-Luna et al., 2008; Sharma, 2001).The questionnaire also assessed the level of integration between environmental, social, quality and health and safety (H&S) aspects and the firm's corporate strategy. This novel construct measures the degree to which environmental, quality (i.e. economic) and health and safety (i.e. social) objectives align and thus directly reflects the stakeholder integration capability introduced in the literature review at the demand level. From a stakeholder theory perspective, the higher the level of integration measured this way, the higher the capability for integrated strategic sustainability management is, since it implies more simultaneous influence of stakeholders and thus less trading-off in value creation.

Overall, of the 4080 firms contacted in Germany and the Netherlands, 704 firms responded to the request to complete the questionnaire, resulting in an overall response rate of 17.3%. Of these, 47 responses had to be excluded owing to missing values. Data from the German Bundesanstalt für Arbeit (BfA, the Federal Agency for Employment) and the OECD were involved (Batenburg, 2006; BfA, personal communication) to assess how representative the responses were. In the Netherlands large and medium-sized firms were less frequent respondents than their smaller counterparts, mainly due to the fact that the Dutch economy is mainly comprised of small firms and that large

[1] The survey was carried out in 2001 in German and Dutch in Germany and the Netherlands, respectively as part of the European Business Environment Barometer project. The original project questionnaire was developed in English and then translated into the respective native languages by native speakers with high proficiency in both languages. The translation was then checked by further independent native speakers and the questionnaire piloted in the native languages with several firms in each country to ensure that no misunderstandings arose in the translation process. It is available upon request from the corresponding author.

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multinationals have mostly only registered their head office in the Netherlands for tax reasons, but usually do not have production sites there. Conversely, for Germany, larger firms with more than 500 employees had a response rate above average, whereas medium-sized and small firms were less inclined to respond. Viewing the sample as a whole, these two counteracting effects broadly balance out, so that the overall sample is largely representative in terms of firm size across both countries.

Turning to the issue of response bias (Armstrong & Overton, 1977), a disproportionate number of firms that are particularly active in terms of environmental management may have responded. Yet characteristics of early and late respondents did not differ significantly. Furthermore, the broad variability found in the responses indicates that the responses also contain environmentally inactive firms and the same is of the case for the Dutch sample (Batenburg, 2006). Table 1 provides a description of the sample.

Beyond response bias, the use of only one survey instrument and self-assessment could be a source of common method bias. However, self-assessment or soliciting data on independent and dependent variables in one instrument does not per se imply the existence of common method bias since it can either de- or increase the observed associations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For the data used, a number of ex-ante and ex-post actions were taken to avoid the issue of common method bias.

This included assuring anonymity of respondents, counter-balancing question order, pre-test improvement of scale item phrasing and heterogeneity in response formats. Concern for respondent anonymity s meant it was not feasible to obtain separating measurement and evaluations from different respondents. Yet, the instructions (e.g. requesting the most knowledgeable person to answer and postal distribution) made it possible for respondents to still implement these. Ex post Harman's single-factor test was used to check the responses for signs of common method bias (Cote & Buckley, 1987). However, it revealed more than ten factors with Eigenvalues greater than 1.0, each explaining below eight percent of variance. Given this evidence against a single, dominant factor accounting for a major share of the variance common method variance is not considered a problem.

2.2. Variable descriptions

Variables were based largely on earlier survey instruments (Baumast, 2000; Belz & Strannegard, 1997; Wagner, 2007) which derived them by identifying narrow and detailed categories for each of the construct in prior literature.

Table 1
Description of the sample.

Variable	Description	Percentage
Industry sector	Food, beverage and tobacco	13.4%
	Textile and leather goods	3.0%
	Wood products	1.4%
	Paper, printing, graphics	8.8%
	Chemicals	16.8%
	Metallurgy	20.5%
	Machinery manufacturing	9.1%
	Electrical, electronical and optical materials/equipment	6.8%
	Transport equipment manufacturing	3.5%
	Other manufacturing industries	16.6%
Size: number of employees	Less than 50 employees	40.4%
	From 50 to 250 employees	32.7%
	More than 250 employees	27.1%
Firm Ownership	Firm in sole proprietorship	39.6%
	Firm not solely owned	60.4%
Country	Germany	46.3%
	Netherlands	53.7%

Note: due to rounding to the first digit, percentages do not always add up to 100%.

Based on this, stakeholder demands are classified using 23 stakeholder groups discussed in the literature (Buysse & Verbeke, 2003; Henriques & Sadorsky, 1999; Murillo-Luna et al., 2008) of which 13 are retained as indicator variables based on the results of a confirmatory factor analysis. These were the parent company, employees, trade unions, distributors, corporate buyers, consumers, consumer associations, insurance companies, national legislators, European legislators, the press and wider media, scientific institutes and local communities. A joint high rating with regard to stakeholder demands from a subset of these groups (measured on a five-point Likert scale ranging from 'none' through to 'very strong') was interpreted as a latent variable representing a specific class of shareholders and was labelled accordingly. This approach has been deemed best because it was pursued in various earlier works and since the resulting dimensions concur with theirs (Henriques & Sadorsky, 1999; Murillo-Luna et al., 2008).

Economic performance is defined here as the component of competitiveness that is caused by environmental management activities. It is then measured following prior literature asking for firm's self-assessment on a number of items asking about the effect of environmental management activities on different aspects such as market share or cost of insuring against risks (Sharma, 2001). Given that economic performance is determined by many factors and that Lankoski (2008) advocates this approach as well, it is considered appropriate, also given the high consistency between self-reported performance assessments by managers and objective measures even across managers (Dess & Robinson, 1984; Powell, 1992; Venkatraman & Ramanujam, 1986). Different dimensions are derived as latent variables which are found to be consistent with prior literature (Judge & Douglas, 1998; Sharma, 2001).

Environmental performance is measured by assessing the environmental impact the firms have in a number of detailed areas (such as energy or water use or harmful emissions), each measured by a separate item variable. The survey asked the respondents to rate their firm's environmental impact relative to the industry average for each of the items on a five-point Likert scale ranging from 'much lower' to 'much higher'. Directly controlling for industry averages this way is desirable because including industry control variables is difficult in structural equation models. Also since independently verified data on environmental performance to date cannot be obtained reliably for firms across different European countries, this approach was considered best for measuring environmental performance (see Sharfman, 1996).

Based on the detailed categories identified for each construct, exploratory and confirmatory factor analyses -which are superior to assess measurement validity (Anderson & Gerbing, 1982; Bagozzi, Yi, & Phillips, 1991)- were carried out on the economic performance, stakeholder demands, integration and environmental performance items used. Alongside the integration variable described earlier, this allowed the confirmation of four latent variables for stakeholder demands, two for environmental performance and four for economic performance and. Whether or not items were retained for the latent variables was decided using the results of the confirmatory factor analyses. The following paragraph briefly describes each latent variable identified this way.

With regard to stakeholder demands, while the existing literature suggests some generic categories, it is still desirable to confirm these from data. Using the individual stakeholders identified in the literature corresponding items were entered into exploratory/confirmatory factor analyses. This was to allow for the emergence of latent variables from the data and in order to establish if the resulting latent variables fit with the typologies identified in earlier studies. The first of the latent variables is named 'Internal' since items relating to demand from managers, shareholders and owning companies load high on it. The second latent variable relates to stakeholder demands from national and European legislators, and is therefore labelled 'Regulatory'. The third latent variable relates to demands from suppliers, distributors, competitors and corporate buyers. Since this essentially refers to different actors in the private sector along the whole supply and value chain, it

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is named 'Value chain'. Finally, a latent variable was identified on which items relating to demands from environmental organisations, local communities, the press/media as well as scientific institutes load high. Given it refers to demands from actors from beyond the supply and value chains of the firm, this latent variable is labelled 'Public'. Overall therefore the latent variables emerging from the data analysis fit very well with the classifications existing in the literature which ascertains their external validity.

With regard to environmental performance, two latent variables relating to resource inputs and emissions were identified. On the first, items relating to water and energy use, toxic inputs and non-renewable resource input load high and so it was named 'Inputs'. On the second, items relating to soil contamination, air emissions, and negative landscape impacts load high, so it was named 'Emissions'. The fact that input and output-related impacts conceptually exhaust the impact space from a natural science perspective conceptually validates these two latent variables which together constitute an encompassing representation of the concept of environmental performance. Furthermore, for the German firms in the sample, the 'Emissions' variable is significantly correlated with actual energy consumption ($r = 0.26$, $p < 0.05$), which, together with the correlation of 'Emissions' and 'Inputs' ($r = 0.30$, $p < 0.05$) externally validates the measures.

Finally, for economic performance the first latent variable identified refers to sales, market share and new market opportunities and because it thus predominantly addresses the market-related benefits of a firm's activities, it is named 'Markets'. The items loading high on the second latent variable are corporate image, management satisfaction, and worker satisfaction. Since it therefore mainly refers to internally-oriented satisfaction/image benefits from a firm's activities, it is named 'Image'. For the third latent variable identified, the items short-term profits, cost savings and productivity are loading high. Since these predominantly refer to short-term it was labelled 'Efficiency'. Finally, a fourth latent variable has the two items 'improved insurance conditions' and 'better access to bank loans' loading high. Since they relate to financial effects from a firm's environmental management activities it is named 'Risk'. Extant literature conceptually validates the four economic performance dimensions identified (Belz & Peattie, 2009; Hart & Dowell, 2011). Furthermore, for the German firms in the sample, the 'Risk' variable is significantly correlated with return on capital ($r = 0.23$, $p < 0.10$), and the 'Efficiency' variable with profit margins ($r = 0.19$, $p < 0.10$) as based on financial statements retrieved from the Amadeus database of Bureau van Dyk. This together with the fact that all four are also significantly correlated with an ordinal profit measure which was self-reported in the survey externally validates the latent economic performance variables.

3. Results

Structural equation modelling (SEM) is employed to test the hypotheses derived. SEM combines factor analysis and linear regression models and so is more powerful and efficient than regression models or other approaches that separate the operationalisation of concepts and analysis of relationships between these (McQuitty, 2004; Williams, Vandenberg, & Edwards, 2009). It is also unique in that it allows the inclusion of latent variables, which is of particular relevance in the context of empirical corporate sustainability research, due to low levels of standardisation in reporting (Rao, 2004). For the analyses AMOS routines were used (Arbuckle, 1999). The usual marker variable strategy of fixing the loading of one of the items each latent variable to 1 was used for purposes of model identification (Ullman, 2001) and the criteria proposed by Babin, Boles, and Robin (2000) and Hair, Black, Babin, and Anderson (2011) to evaluate model quality.

The two-stage procedure proposed by Anderson and Gerbing (1982) is used to avoid confounding issues in interpreting the SEM results. Thus at the first stage the measurement model is evaluated. After verifying the unidimensionality of the latent variables at the first stage, at the second stage the structural model is discussed. Hair et al. (2011) suggest to rely on both absolute and incremental fit indices to judge overall model quality. As is good practice, the measurement model is estimated without cross-loadings and without assuming covariances between individual error terms.

As concerns the overall model fit of the measurement model the normed chi-square of 1.95 is below the threshold of 2 and the root mean square error of approximation (RMSEA) is 0.037, which is below the threshold of 0.05 (Hair et al., 2011; Hu & Bentler, 1999). Simultaneously, the comparative fit index (CFI) of 0.937 reveals very good incremental fit since it is well above the recommended minimum value of 0.9 (Hair et al., 2011). This is also supported by the incremental fit index (IFI) value of 0.938 for the measurement model and its Tucker-Lewis-Index (TLI) of 0.928 (Tucker & Lewis, 1973). Finally, the standardized root mean residual (RMR) of 0.04 is well below 0.08 as the threshold given in Hair et al. (2011, p. 672).

Beyond overall model fit, Table 2 summarises the validity measures for the identified latent variables that are relevant according to Hult et al. (2006). The indices of local fit indicate that constructs are reliably measured. In addition, all factor loadings of the manifest items were significant, as is visible from the *t*-values in column 4 of Table 2. In total, the overall goodness-of-fit measures as well as the standardised regression weights (of which only three with values of 0.47 and 0.46 are marginally below the threshold suggested by Hair et al. (2011, p. 695); 56% have values above 0.67) and their significance levels for convergent validity and the Fornell-Larcker ratios for discriminant validity suggest that the measurement model has a good fit (Fornell & Larcker, 1981).

Fig. 2 gives an overview of the structural model. Following Hair et al. (2011) the evaluation of model fit is based on chi-square measures and indicates that the measurement model has a very good fit, since the normed chi-square is well below 2 (chi-square: 935.68, df = 501). Furthermore, the RMSEA for the model is 0.035, which is again below the usual threshold. As well, a CFI of 0.942 indicates good incremental fit of the structural model since it is above the commonly suggested minimum threshold value of 0.9 (Bentler, 1990). This is also supported by the incremental fit index (IFI) value of 0.937 for the overall model and the Tucker-Lewis-Index (TLI) of 0.928 also supports good fit (Tucker & Lewis, 1973). As well, the P ratio of 0.893 suggests good parsimony of the model. Furthermore, the standardized RMR of 0.05 is very good. Finally, the Hoelter criterion values of 389 (at the 0.05 level) and 405 (at the 0.01 level) both suggest a very good model fit, since both values clearly exceed 300 (Bagozzi & Yi, 1988; Bagozzi et al., 1991). Overall, the model fit meets or exceeds the standards of model fit, based on the criteria proposed by Hair et al. (2011, p. 672).

Table 3 gives details for the paths in the structural model. Beyond this, also all loadings of the observable indicators on the latent variables are significant and point in the right direction, i.e. have the correct sign.

Prior to hypothesis testing and as a sensitivity analysis, an alternative model which only includes direct links between the different economic and environmental performance dimensions was also considered. That is, in the spirit of the "pays-to-be-green" literature, we assume that no third variable jointly influencing economic and environmental performance dimensions simultaneously is present. Hence in this model stakeholder demands directly affect performance dimensions and given the individual stakeholders underlying the latent variables, it is assumed that internal and value chain stakeholders predominantly influence economic performance and that regulatory and public stakeholders mainly affect environmental performance dimensions. Fig. 3 provides a summary of this alternative structural model.

Evaluating the fit of this alternative model based on chi-square (chi-square: 755.45, df = 401) as before indicates that this alternative model has a less good fit than the model in Fig. 2 with the mediating integration variable. The RMSEA, which for the alternative model in Fig. 3 is 0.037, further supports this view. The CFI for the model is 0.942 and therefore not better than in the initial model presented in Fig. 2 and the Hoelter criterion values are 385 (at the 0.05 level) and 403 (at the

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Table 2
Results of confirmatory factor analysis and construct validity tests.

Latent variable	Indicator variables	Factor loadings (standardised regression weights)	t value (*** < 0.01)	Fornell-Larcker ratio
Efficiency	Short-term profits	0.47	-	0.46
	Cost savings	0.41	8.02***	
	Productivity	0.39	1.46***	
Image	Corporate image	0.43	-	0.73
	Management satisfaction	0.66	15.11***	
	Employee satisfaction	0.44	13.66***	
Risk	Bank loans	0.57	-	0.60
	Insurance conditions	0.64	7.55***	
Market	New market opportunities	0.48	-	0.28
	Sales	0.56	15.53***	
	Market share	0.65	13.84***	
Integration	Safety	0.50	-	0.77
	Quality	0.45	14.43***	
	Strategy	0.53	13.76***	
Inputs	Water inputs	0.36	-	1.16
	Energy inputs	0.41	10.13***	
	Toxic inputs	0.22	8.58***	
	Non-renew-able inputs	0.25	8.91***	
Emissions	Soil contamination	0.52	-	0.90
	Air emissions	0.46	11.04***	
	Landscape impacts	0.21	9.10***	
Regulatory	National legislators	0.65	-	0.30
	European legislators	0.93	18.21***	
Internal	Managers	0.48	-	1.39
	Shareholders	0.44	13.83***	
	Parent firms	0.29	11.57***	
Public	NGOs	0.46	-	0.83
	Communities	0.56	16.42***	
	Press/media	0.68	17.72***	
	Scientific institutes	0.58	16.75***	
Value Chain	Suppliers	0.51	-	1.35
	Distributors	0.47	15.30***	
	Competitors	0.43	14.72***	
	Corporate buyers	0.45	15.00***	

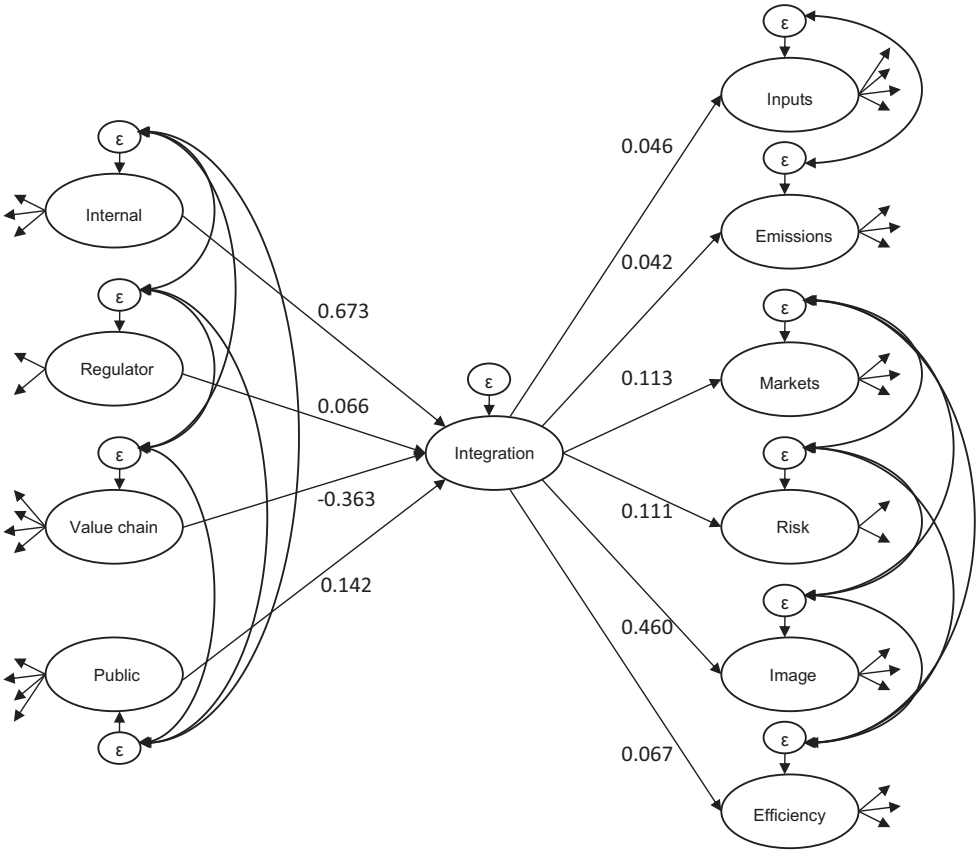

Fig. 2. Graphical representation of integration-mediated structural equation model (non-standardised weights).

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Table 3
Fit indicators and standardized weights for individual paths of model in Fig. 1[a].

Model path considered			S.E.	C.R.	P	Standardized weight
Integration	-	Regulatory	0.048	1.362	0.173	0.085
Integration	-	Value chain	0.137	−2.646	0.008	−0.339
Integration	-	Public	0.080	1.779	0.075	0.151
Integration	-	Internal	0.106	6.344	<0.001	0.914
Efficiency	-	Integration	0.023	2.972	0.003	0.189
Image	-	Integration	0.051	8.988	<0.001	0.741
Risk	-	Integration	0.022	5.068	<0.001	0.399
Markets	-	Integration	0.025	4.604	<0.001	0.265
Emissions	-	Integration	0.050	0.832	0.406	0.047
Inputs	-	Integration	0.052	0.883	0.377	0.049

[a] Notes: S.E. means standard error, C.R. means critical ratio, P means probability.

Table 4
Fit indicators and standardized weights for individual paths of model in Fig. 2 [a].

Model path considered			S.E.	C.R.	P	Standardized weight
Emissions	-	Regulatory	0.042	10.989	0.047	0.123
Inputs	-	Regulatory	0.044	0.458	0.647	0.027
Inputs	-	Public	0.056	10.956	0.051	0.122
Emissions	-	Public	0.053	−0.752	0.452	−0.048
Markets	-	Internal	0.030	−0.492	0.623	−0.047
Risk	-	Internal	0.028	30.688	<0.001	0.479
Image	-	Internal	0.050	60.317	<0.001	0.722
Efficiency	-	Internal	0.029	10.029	0.304	0.113
Markets	-	Value chain	0.044	30.907	<0.001	0.371
Risk	-	Value chain	0.037	−10.536	0.124	−0.182
Image	-	Value chain	0.064	−10.588	0.112	−0.155
Efficiency	-	Value chain	0.041	0.261	0.794	0.028
Markets	-	Inputs	0.034	−0.707	0.480	−0.053
Markets	-	Emissions	0.038	10.844	0.065	0.143
Risk	-	Inputs	0.029	0.646	0.519	0.060
Risk	-	Emissions	0.032	−0.135	0.892	−0.013
Image	-	Inputs	0.046	−20.024	0.043	−0.147
Image	-	Emissions	0.050	10.411	0.158	0.103
Efficiency	-	Inputs	0.033	−10.287	0.198	−0.113
Efficiency	-	Emissions	0.036	0.249	0.803	0.022

[a] Notes: S.E. means standard error, C.R. means critical ratio, P means probability.

0.01 level) and thus also less good than for the initial model summarised in Fig. 3. Finally, the P ratio of 0.862 indicates also a less parsimonious model, since it is less close to unity. In addition, the fact that most of the corresponding path estimates reported in Table 4 are insignificant suggests that the assumption of a third variable jointly influencing economic and environmental performance is valid and necessary to account for heterogeneity across firms. This means that stakeholders and performance are not "hard-wired" as in a model assuming direct links between environmental and economic performance. This latter model performs less good because it cannot adequately represent the notion of firm idiosyncrasies. Based on these insights, the model results reported in Table 3 can be used for hypothesis testing.

Based on Table 3, support is found for H1 proposing a positive relationship between the level of internal stakeholder demands and integration. Also it becomes clear that H2 and H3 which propose a positive relationship between levels of regulatory and value chain stakeholder demands and integration are not supported. H4, proposing a positive relationship between public stakeholder demands and integration draws somewhat weaker support in that the link is just significant at 0.075.

With regard to the relationship of integration with environmental and economic performance, support is found for H5 (which proposed a positive association of integration with economic performance) for the latent economic performance dimensions related to market chances, risk and image. H5 is also partly supported for the efficiency subdimension where the significance level of 0.003 is slightly lower than the very strict 0.001 threshold of SEM (which precludes spurious correlations driving significance – I am grateful to one anonymous reviewer for pointing this threshold out to me). However, even applying the strict threshold would imply that for the large majority of economic

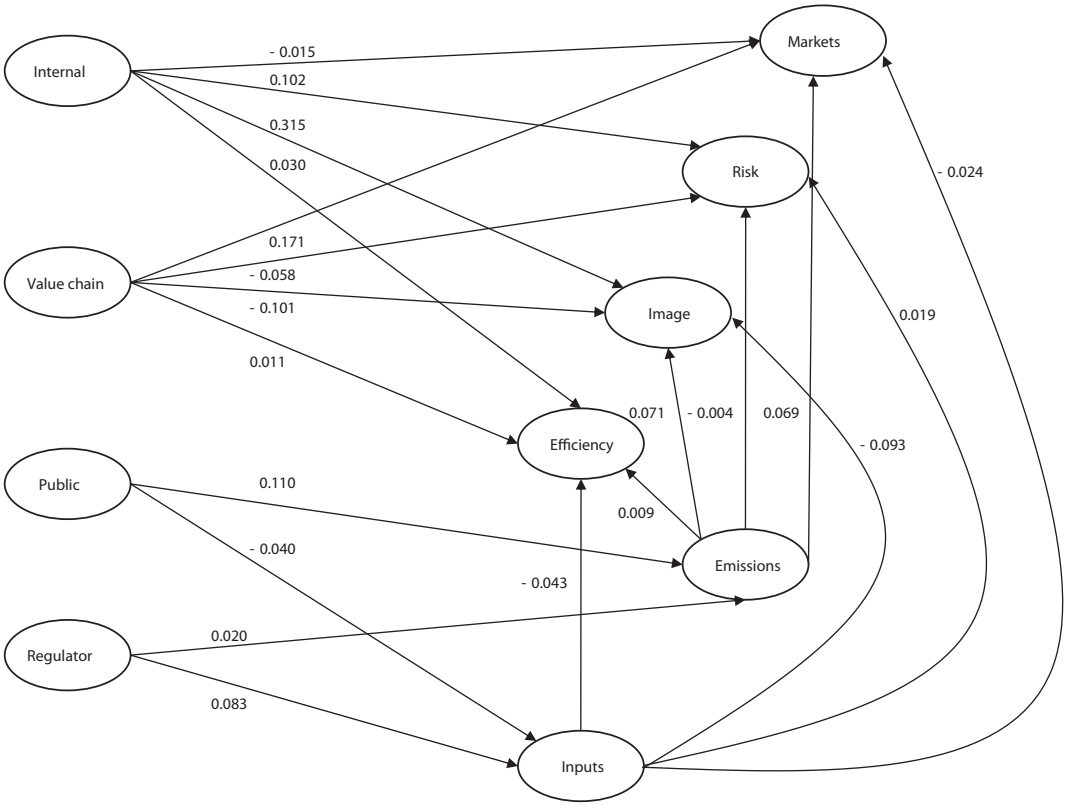

Fig. 3. Graphical representation of non-mediated structural equation model (non-standardised weights; indicator variables and correlation of error terms as in Fig. 1).

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performance dimensions H5 is fully confirmed. Conversely, the hypothesis H6a proposing a positive association between integration and input- and output-oriented environmental performance is not supported for both dimensions. In consequence, the rival hypothesis H6b is supported, since for both dimensions the path coefficients are insignificant and positive in sign (which indicates increased emissions and inputs).

Therefore, the hypotheses are supported in the majority. The findings remain also basically unaffected by firm type (solely owned or not), firm size and industry type (cleaner versus less clean industries based on the Mani and Wheeler (1998) classification).[2] Whilst there are some effects of country location (Wagner, 2011), these do basically not affect the identified relationships of internal stakeholders with integration, nor the association of integration with sub-dimensions of environmental and economic performance. Signs of all coefficients except for one remain identical across countries. Whilst the strength of links between integration and economic performance varies somewhat, they all remain significant for each country individually (with the only exception being efficiency, where the link becomes insignificant for the Dutch firms).

Most importantly, the results for the link between integration and environmental performance remain basically unchanged, that is, the salient finding of an insignificant or negative environmental performance effect of integration does not change. This specific result of testing the competing hypotheses 6a and 6b on the link of integration and environmental performance and heterogeneity in the findings for different stakeholder groups will also be discussed in more detail in the following section.

4. Discussion and conclusions

Institutional theory allows for a decoupling of environmental and economic performance that is consistent with a non-significant relationship of integration with environmental performance (Hironaka & Schofer, 2002). That is, firms see sustainability management as a ceremonial function while the conventional "core" of the firm and the environmental impact linked to it is consequently "buffered" (Meyer & Rowan, 1977).

Opposed to this, the (natural) resource based view has an implicit assumption that the development of competitively advantageous capabilities relating to sustainability management also leads to improved environmental performance, for example through divestment of problematic business activities or a focus on pollution prevention. Underlying both theories are stakeholders, which are directly addressed in stakeholder theory and who voice demands in different performance dimension, where, based on strategic resources (such as a better understanding created through a stakeholder integration capability), creating more value than competitors is crucial for the long-term success of a firm.

The results of this study suggest that whilst all three theories jointly can provide a comprehensive overarching framework, each on its own can only partly explain empirical observations. Specifically, whilst the finding of a significant association of integration with all dimensions of economic performance is in line with the natural resource based view, the lack of a positive effect on environmental performance violates this theory. Conversely, this latter finding fits well with arguments derived from institutional theory (Hoffman, 1999, 2005; Marquis et al., 2011), whereas the ability of stakeholder theory in explaining why firms differ in a similar institutional context does not have to be involved (Parmar et al., 2010).

Therefore, although this paper does not attempt to test any theory as a whole, the results can help to identify important areas where the three theories introduced above need extension and how they might be synthesized more comprehensively into a more general model. Specifically, the findings suggest that the capabilities that the natural resource based view assumes to develop are still largely focused on business objectives. Therefore, the extension proposed by Hart (1995) as part of the natural resource based view of capabilities simultaneously supporting sustainability objectives such as environmental performance may not be as easily feasible as was initially assumed and future research needs to identify the specific conditions that determine the feasibility of such an extension.

To be more specific, an insignificant association of integration and environmental performance as found here is a result that strongly suggests the need for theory development. This finding can be explained if it is assumed that sustainability integration in practice mainly reflects capabilities relating to business objectives (whereas one important condition for the natural resource based view being fully applicable would be that capabilities relating to corporate social responsibility objectives need to be reflected equally).

Relating this to the findings of Marcus and Anderson (2006) may imply that firms with a strong stance on business objectives are well-positioned to improve their economic performance. However, when no single general capability matters for business and sustainability objectives, this may hinder simultaneously addressing these latter objectives. Ultimately, this creates a trade-off for firms aiming to be good at improving environmental performance which in consequence suggests that the natural resource based view could be self-limiting with regard to enabling firms to continuously moving towards greater corporate sustainability by simultaneously improving environmental and economic performance.

Turning to institutional theory the considerable difference in the positive effect of internal and public stakeholders on integration levels (with path coefficients of 0.67 versus 0.14, respectively) supports earlier findings (Darnall, Henriques, & Sadorsky, 2010). The fact that regulatory stakeholder demands are not positively associated with integration could suggest that other means exist to address these demands, perhaps through pre-regulation lobbying activities, and that arguments based on institutional theory are not particularly applicable here. Similarly, the finding that value chain demands is negatively associated with integration could be explained by the increasing relevance of environmental and social standards such as SA 8000 or AA 1000 which require firms to interface more across the supply chain (Heugens, van den Bosch, & van Riel, 2002; Müller et al., 2009).

These findings could suggest that institutional adjustment in the context of corporate sustainability has not yet moved from ceremonial encapsulation to institutional change. That is, stakeholder demands leading to changes in organisational fields do not have so strong effects that they alter the capability focus on business objectives, especially as concerns dynamic capabilities. Consequently, only clearer transmission of stakeholder demands to the firm would seem to be able to overcome the above-mentioned limitation and ensure the momentum for improvements in corporate sustainability is maintained.

This also holds insights for stakeholder theory as the latter has also been suggested to explain rent distribution into stakeholder networks (Parmar et al., 2010). It appears that increased transparency resulting from standards such as the Global Reporting Initiative, ISO 26000 or ISO 17025 can improve such distribution. This is supported by the fact that studies find a positive association of reporting quality with levels of environmental and economic performance (Al-Tuwaijri, Christensen, & Hughes, 2004; Groening & Kanuri, 2013). How standards support distribution could thus be an important area for future research. Another promising area for future work seems to the extension of the natural resource based view combining recent conceptualisations of dynamic capabilities (Helfat et al., 2007) with stakeholder theory in order to arrive at a comprehensive framework that integrates distributional and relational aspects with the natural resource based view. Indeed, Parmar et al. (2010) suggest that combining the resource based view with the relational view of the firm provides close links to stakeholder theory and

[2] Results of the nested model comparisons showing this are available upon request from the corresponding author.

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that this can also speak to managers interpreting differentially the institutional role of specific stakeholders such as customers or government, which in turn highlights additional research opportunities in terms of integrating stakeholder and institutional theory.

In summary, this study contributes to the field of corporate sustainability management by applying a micro-level, theoretically-grounded, and mechanism-based analysis of the drivers of environmental and economic performance and their relations. It therefore advances the "pays-to-be-green" literature and the discussion on sustainability integration. Furthermore, the study empirically addresses an important gap in the literature as concerns environmental performance improvements and based on this identifies self-limiting elements specifically for the natural resource based view as a potential impediment for maintaining and extending corporate sustainability contributions. In so doing, it will hopefully help academics to pursue more targeted research and managers to make better informed decisions to support the long-term availability of public goods.

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