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Stakeholder Pressures, Environmental Practice Adoption and Economic Performance in the German Third-party Logistics Industry—A Contingency Perspective

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Abstract This study explores how companies adopt environmental practices when they are exposed to stakeholder pressures and how those practices affect economic performance within the German third-party logistics industry. The relationships are tested against a random sample of 192 German third-party logistics providers by using a higher-order partial least squares approach. The study reveals that perceived stakeholder pressures, especially internal, market, and regulatory pressures, strongly influence third-party logistics providers' environmental practice adoption and that environmental practice adoption improves economic performance. Moreover, by introducing complexity of service offerings as an important firm-related contextual variable, the study advances our knowledge as it highlights that companies with basic service offerings can benefit more from adopting environmental practices than companies with advanced service offerings.

Keywords Environmental sustainability · Third-party logistics · Partial least squares · Contingency perspective

JEL Classification M10 · M14 · F64

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1 Introduction

Climate change, chemical pollution, environmental degradation and resource depletion are urgent global issues that need to be addressed as soon as possible (Scherer et al. 2013; Whiteman et al. 2013; Söllner 2014). The business sector, accused to be the main polluter, faces increasing pressures from various stakeholders expecting businesses to conserve global resources, reduce emissions and develop sustainable business practices (Halldorsson and Kovács 2010; Van Wassenhove and Besiou 2013; Graf and Wirl 2014). Many companies have responded to these pressures by launching environmental initiatives and issuing public statements regarding their environmental practices (Ruhnke and Gabriel 2013). Traditionally, such environmental practices have been perceived as a threat to a firm's economic performance due to the expected additional costs, but a broad range of companies have provided evidence that incorporating sustainability principles into their business activities can actually improve performance (Hart 1995; Porter and Van der Linde 1995; Endrikat et al. 2014). In the academic literature, hundreds of studies have explored why companies implement environmental practices and whether their implementation pays off. The findings of the latter group have however been ambivalent (Orlitzky et al. 2003). As a result, an increasing number of scholars have acknowledged the possibility that such a general relationship between environmental practices and economic performance may not exist and have called for research on specific boundary conditions (Husted 2000; Dixon-Fowler et al. 2013; Grewatsch and Kleindienst 2015; Javed et al. 2016). These scholars suggest a stronger focus on conditions benefitting the implementation of environmental practices, instead of simply asking whether it pays off to be green. In other words, they emphasize the need for adopting a contingency perspective by including meaningful factors that affect the relationship between environmental practices and economic performance (Aragón-Correa and Sharma 2003; Carroll and Shabana 2010; Wagner 2010; Dixon-Fowler et al. 2013; Schoenherr et al. 2014; Grewatsch and Kleindienst 2015; Javed et al. 2016). However, only a few studies have yet addressed these issues. In fact, Grewatsch and Kleindienst (2015) show in a recent meta-analysis that previous studies have widely focused on "usual suspects", such as firm size and industry, whereas other meaningful contextual variables, such as strategic orientation or competitive strategy, have been widely neglected. In a similar manner, Javed et al. (2016) argue that scholars should employ new contingency factors, rather than relying on commonly used ones. As a result, these scholars stress the argument that it is of the greatest importance to explore novel constructs in the context of environmental practice adoption.

This study attempts to overcome this research gap and advance our knowledge by introducing "complexity of service offerings" as an important, but largely neglected firm-related contextual variable in the current literature. Complexity of service offerings is closely connected to Porter's (1980) generic strategies. The variable refers to the decision that every company must take on whether to compete with basic, widely standardized products and services or to offer customized, more differentiated products and services.

As a result, this study addresses the research question of how the complexity of service offerings influences the pressure–response–outcome relationship in the context of environmental practice adoption. To be more precise, we argue that the

complexity of service offerings will affect the way companies respond to perceived stakeholder pressures and that the impact of environmental practice adoption on economic performance will vary as a function of it.

To examine these relationships, we ground our research on a contingency theoretical perspective and test our research model against a random sample of 192 German third-party logistics (3PL) providers by using a higher-order partial least squares approach. 3PL providers are external companies who offer logistics functions that have traditionally been performed within an organization. These functions can encompass selected activities or even the entire logistics process (Lieb 1992). In addition to the general transportation sector, 3PL providers who carry out 40–60% of logistics activities in developed countries are particularly important actors when considering environmental sustainability. The transportation sector represents the fastest growing sector in terms of energy consumption and greenhouse gas emissions in the European Union (Oberhofer and Dieplinger 2014). Analyses from the International Panel on Climate Change demonstrate that the freight transportation sector is responsible for roughly 8–9% of the global energy usage and the global energy-related greenhouse gas emissions (Beuthe et al. 2007). Furthermore, warehousing-related and goods-handling activities of those actors add approximately another 2–3% (McKinnon 2010).

This study makes two contemporary and important contributions to the literature and advances our knowledge in various ways. First, the study explores mechanisms of how the complexity of service offerings may affect the relationships between perceived stakeholder pressures, environmental practice adoption, and economic performance. Second, this study advances our knowledge by providing empirical evidence that companies with basic service offerings can benefit more from adopting environmental practices than companies with advanced service offerings.

The remainder of this paper is organized as follows: First, we review the relevant literature and derive a set of theory-driven research hypotheses. Then, we describe the research methodology before presenting the results of our analysis. Finally, we discuss the findings of our study, demonstrate theoretical and managerial implications and outline directions for future research.

2 Literature review and theoretical concept

In order to realize our objectives, we first reviewed the relevant natural environment literature. In particular, we reviewed studies that deal with (1) effects of stakeholder pressures on environmental practice adoption and (2) effects of environmental practice adoption on a firm's economic performance. We did so, as scholars have increasingly argued for using a pressure-response-outcome perspective (Wagner 2011, 2015) (see Fig. 1). Figure 1 shows how the pressure-response-outcome perspective links stakeholder demands, firm behavior and economic outcomes. This serves as an overarching theoretical framework for the study. Concerning this perspective, Darnall et al. (2010), for instance, reasons that in the context of the natural environment, stakeholders can pressure firms to adopt environmental

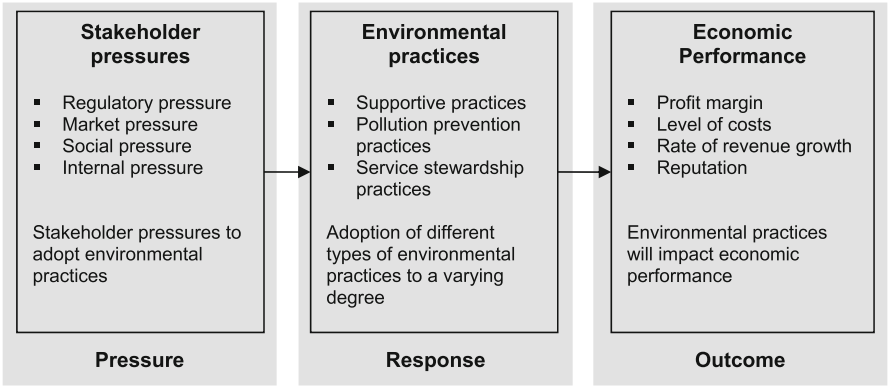

Fig. 1 Research framework

practices, which in turn improves economic performance through an increase of internal efficiency and external legitimacy.

2.1 Stakeholder pressure and environmental practice adoption

The influence of stakeholder pressures on the adoption of environmental practices has been well established in the literature (Sarkis et al. 2010). The predominant theoretical lens that has been used to explain this relationship is the stakeholder theory (Meixell and Luoma 2015; Touboulic and Walker 2015; Busse 2016). According to the instrumental stakeholder theory, it is in a company's own interest to consider stakeholders' demands, as they provide the company with important inputs and help them to achieve corporate performance objectives (Busse 2016). Moreover, it is argued that stakeholders can influence the practices of an organization by exerting pressures on it (Kassinis and Vafeas 2006). The theory considers a stakeholder as "any group or individual who can affect or is affected by the achievements of the organization's objective" (Freeman 1984, p. 46). While some authors argue that firms primarily design their environmental practices according to those stakeholders that they believe are the most important—regulatory, market, internal and social stakeholders (Henriques and Sadorsky 1999; Buysse and Verbeke 2003; Sharma and Henriques 2005)—more recent research shows that pressure from any stakeholder can impact environmental practice adoption (González-Benito and González-Benito 2006; Murillo-Luna et al. 2008; Rueda-Manzanares et al. 2008; Darnall et al. 2010).

Furthermore, studies suggest that in addition to "objective stakeholder pressure", "perceived stakeholder pressure" is also important when it comes to environmental practice adoption (Delmas and Toffel 2004; Darnall et al. 2010; González-Benito and González-Benito 2010). In fact, Darnall et al. (2010) even concluded that, from a manager's perspective, it matters less whether perceived stakeholder pressures reflect actual levels of stakeholder concerns. Rather, managers who perceive a certain stakeholder's pressure are more likely to undertake actions to address that stakeholder's concerns.

Despite the different viewpoints, research concordantly agrees that stakeholder pressures have a positive effect on the degree of environmental practice adoption, but outline that additional variables exist that might directly influence environmental practice adoption or moderate firms' environmental responses to stakeholder pressures (Garcés-Ayerbe et al. 2012). Garcés-Ayerbe et al. (2012) provide a comprehensive overview by distinguishing factors that refer to firm-related characteristics: strategic proactivity, capacity for innovation, availability of complementary resources and capabilities, and the firm's size (Aragón-Correa 1998; Claver et al. 2007; Sharma et al. 2007; Darnall et al. 2010); business environment-related characteristics: perceived uncertainty, complexity, and munificence (Sharma et al. 2007; Rueda-Manzanares et al. 2008); as well as managerial characteristics: managers' interpretation of environmental issues, managers' expectations of competitive advantages, and managers' environmental beliefs, attitudes and motivations (Sharma 2000; Sharma and Henriques 2005; González-Benito and González-Benito 2006; Dahlmann et al. 2008; Gadenne et al. 2009). In this context, Darnall et al. (2010) explicitly warned researchers, managers, and policymakers to be cautious about associating stakeholder pressures directly with the degree of environmental practice adoption across all types of firms. While research has already examined a broad set of different variables, none so far has considered the complexity of service offerings. As we will outline later, this is a relevant firm-related internal aspect that needs further analysis.

2.2 Environmental practice adoption and economic performance

Other than the literature on the relationship between stakeholder pressures and environmental practice adoption, a large body of research has investigated the effects of environmental practice adoption on economic performance (for a systematic review, please see Ambec and Lanoie 2008). However, the findings have been inconsistent as the relationship between environmental practices and economic performance has been argued and found to be positive (King and Lenox 2001; Konar and Cohen 2001; Orlitzky et al. 2003), insignificant (Surroca et al. 2010), negative (Cordeiro and Sarkis 1997; Stanwick and Stanwick 1998; Green et al. 2012), or U-shaped (Lankoski 2008; Barnett and Salomon 2012). As a result, recent studies have questioned the existence of a simple relationship between environmental practice adoption and economic performance and request that researchers focus more on the boundary conditions of this relationship (Dixon-Fowler et al. 2013; Grewatsch and Kleindienst 2015; Javed et al. 2016). In this matter, Golicic and Smith (2013) investigated firm size, geographical region, industry and economic conditions as potential moderators in their meta-analysis. Klassen and McLaughlin (1996) revealed that the relationship between environmental practice adoption and economic performance fluctuates across industries and highlight that a superior environmental management has a stronger positive impact on economic performance in clean industries than in polluting industries. Russo and Fouts (1997) on the other hand, show that industry growth reinforces the relationship between environmental practice adoption and economic performance. Moreover, using an event study methodology, Gilley et al. (2000) highlight that the effects of

environmental practice adoption on economic performance strongly depend on the type of environmental initiatives. To be more precise, they reveal that the stock market reacts positively to product-driven environmental initiatives, but negatively to process-driven ones. Aragón-Correa and Sharma (2003) focus on the general business environment and argue that uncertainty, complexity, and munificence affect the link between environmental practice adoption and competitive advantage. Finally, Dixon-Fowler et al. (2013) analyzed a set of different boundary conditions by forming subgroups of small versus large firms, public versus private firms, US-based versus internationally based firms, and high versus low polluting firms. They conclude that environmental practice adoption matters for all companies regardless of industry, that it is similarly beneficial for both public and private companies, that US-based companies benefit more than internationally based ones and that environmental practice adoption has a stronger positive impact for small companies than for large ones.

Despite these findings, it was concluded "that future research should investigate additional moderating influences to better understand this relationship." (Dixon-Fowler et al. 2013, p. 363). Grewatsch and Kleindienst (2015, p. 23) put it more drastically by stating that they "were surprised to find that many of the moderators and mediators explored in the prevailing literature were the 'usual suspects,' such as firm size or industry" and stressed the argument to "explore novel constructs that have the potential to moderate and/or mediate" the relationship between environmental practice adoption and economic performance. They provide meaningful recommendations and explain in detail which factors should be analyzed in future research—ranging from external factors such as Market Structure, Labor Market Conditions, or Strategic Networks to internal factors such as Leadership Style, Product Type, Ownership Type, Organizational Commitment, or Competitive Strategy. In a similar way, Javed et al. (2016) provide a systematic overview on different contingency factors on the firm-, industry- and country-level and call for studies using novel contingency factors. In this study, we respond to their calls and introduce the complexity of service offerings as a meaningful firm-related internal boundary condition.

2.3 Complexity of service offerings in the third-party logistics provider industry

Over the last two decades, the third-party logistics provider industry has fundamentally changed (CapGemini 2016). Third-party logistics are activities which are carried out by a logistics service provider on behalf of a shipper and consist of at least the management and execution of transportation and warehousing (Berglund et al. 1999). Additional activities such as inventory management, tracking and tracing, secondary assembly and installation of products can be integrated into the service offering. While many early 3PL providers offered only a limited range of services and/or operated in a narrow geographical area, today logistics services range from routine transportation and warehousing to customized complex and bundled logistics arrangements (Bask 2001; Selviaridis and Spring 2007; Marasco 2008; Leuschner et al. 2014; CapGemini 2016). Following Bask

(2001), 3PL providers can be distinguished according to the complexity of their service offerings, which can vary from simple to complex. Similarly, Delfmann et al. (2002) conclude that 3PL providers can be grouped with regard to the degree of customization. Following these classifications, we find two different types of providers which can be detailed as routine and customized. Routine 3PL providers limit their service offerings to standardized and isolated logistics services and mainly cover all basic transportation and warehousing services (Berglund et al. 1999). The basic services they perform for their customers have a low level of complexity and are highly standardized, resulting in interchangeable services among these 3PL providers (Andersson and Norrman 2002). These companies normally do not take over coordinational and administrative functions for their customers, but mostly handle homogeneous objects and optimize their logistics system with regard to these logistics objects. The reasoning behind these basic services is economies of scale, i.e. services are volume-based (Berglund et al. 1999). Thus, the most important reasons for their selection are competitive price, ease of service procurement, reliability and requested transport time (Bask 2001; Delfmann et al. 2002).

The second type of 3PL providers is the highly customized provider, who designs logistics services according to the preferences of their customers (Berglund et al. 1999; Hertz and Alfredsson 2003). In more extreme cases, 3PL providers even jointly develop unique logistics solutions with their customers (Halldorsson and Skjøtt-Larsen 2004). Customized 3PL providers frequently take over coordinative and administrative responsibility for their customers and commonly offer advanced services that are not originally attributable to the logistics functions, but rather to financing, consultation and production or IT-related activities (Delfmann et al. 2002; Prockl et al. 2012). These advanced services often cause high transaction costs because of high investments in IT systems, information flows, coordination of work, joint planning, or other resources (Bask 2001).

These two forms of 3PL providers—providers with basic and advanced service offerings—can be seen in the light of Porter's (1980) generic strategies. In fact, routine 3PL providers with basic services are more likely to follow a cost leadership, whereas customized 3PL providers with their advanced services are more likely to follow a differentiation strategy by customizing their services (Sum and Teo 1999). This strategic orientation will widely determine the degree of environmental practice adoption and how beneficial the implementation of environmental practices will be for corporate economic performance. In fact, it has been argued that companies following a cost leadership strategy are more likely to adopt environmental practices if it helps them to gain a low-cost position, as this allows a company to use aggressive pricing and high sales volume. On the other hand, companies who offer differentiated products and services are more likely to adopt environmental practices if it helps them to create brand loyalty and gain a positive reputation as this justifies charging a premium price (Hart 1995).

2.4 Contingency theoretical perspective

Contingency theories have been a major theoretical lens in the management and organizational behavior literature (Donaldson 2001; Van de Ven et al. 2013). They were developed and their acceptance grew largely because they responded to criticisms that the classical theories advocated a "one best way" of organizing and managing companies (Tosi and Slocum 1984; Van de Ven et al. 2013). Contingency theorists have stressed the importance of the fit between a firm's practices and the external and internal contingencies a firm is facing in order to improve firm performance (Husted 2000; Barnett 2007; Hart and Dowell 2010; Delmas and Pekovic 2015; Wang et al. 2015). Moreover, recent research has also shown how external and internal contingencies influence the relationship between stakeholder pressures and the adoption of environmental practices (Aragón-Correa and Sharma 2003; Darnall and Edwards 2006; Delmas and Toffel 2008). In this context, Aragón-Correa and Sharma (2003) state that managers may view pressures from various stakeholders fluctating—in the sense that they may have weaker or stronger influences on environmental practice adoption. In line with a contingency perspective, we argue that the complexity of service offerings is an important firm-related internal variable, which helps to explain why companies respond differently to stakeholder pressures and why the adoption of environmental practices has different effects on the economic performance of a company.

3 Hypotheses development

3.1 Perceived stakeholder pressures and environmental practice adoption

The natural environment literature advanced the idea that different stakeholder groups have the capability to influence a firm's environmental practices by exerting pressures on it (Kassinis and Vafeas 2006). However, not only objective stakeholder pressures, but also a firm's perception of these pressures can shape its adoption of environmental practices. In fact, previous research has shown that stronger perceived stakeholder pressures will lead to a higher implementation of environmental practices (de Bakker and Nijhof 2002; González-Benito and González-Benito 2006; Darnall et al. 2010). For instance, managers of 3PL providers may feel obliged to exceed current vehicle emission standards or to adopt ISO 14001 certification as national governments or environmental agencies (e.g. European Environment Agency) send clear signals of their endorsement of such aspects (regulatory pressure) (Delmas and Toffel 2004). Moreover, managers of 3PL providers may feel pressured by NGOs and environmental organizations such as Greenpeace to adopt certain environmental practices because they fear negative publicity (social pressure) (Graf and Rothlauf 2012). In addition, customers are increasingly asking for environmentally friendly transportation services from 3PL providers (market pressure) and employees can threaten to quit the company (internal pressure) (Oberhofer and Dieplinger 2014). Therefore, companies need to understand their stakeholders' interests and the consequences that these have on

their business conduct (Litz 1996). By considering a contingency perspective, it has recently been argued that the effects of perceived stakeholder pressures on environmental practice adoption are influenced by certain factors such as a company's strategic orientation (Grewatsch and Kleindienst 2015; Javed et al. 2016). In line with the contingency perspective, we argue that the complexity of service offerings influences the 3PL providers' decisions on how to cope with the perceived stakeholder pressures. We introduce two lines of argumentation—resource constraints and conflicting stakeholder demands—in order to explain the influencing effects of complexity of service offerings.

As outlined in the theoretical background section, 3PL providers can be distinguished according to the complexity of service offerings, which range from basic service offerings to complex and bundled logistics arrangements (advanced service offerings) (Bask 2001; Halldorsson and Skjøtt-Larsen 2004). In the 3PL industry, shippers apply different selection criteria when purchasing basic service offerings than when purchasing complex service offerings (Halldorsson and Skjøtt-Larsen 2004; Sahay et al. 2006). Basic logistics services are bought separately or only bundled with a few other services. This has made the services quite simple and a large set of providers are available and willing to offer low prices to secure high utilization of their capacity. This is leading to a strong buyers' position against providers of basic logistics services (Andersson and Norrman 2002), which increases the resource constraints of 3PL providers with basic service offerings. Additionally, in order to be able to offer their basic service offerings at a low price, 3PLs must seek resource efficiency and thus do not have extensive slack resources. This resource scarcity is likely to influence 3PL providers of basic logistics services to be more responsive to stakeholder pressures than advanced logistics services providers. For instance, it can be argued that when facing stakeholder pressures, resource constrained firms are less likely to allocate scarce resources towards environmental lobbying activities than to use their limited resources to address immediate environmental concerns (Darnall et al. 2010). Conversely, as customized 3PL providers may be less constrained by their resources, they may use certain strategies such as environmental lobbying activities to bypass the stakeholder pressures on adopting environmental practices.

A second argument is that customized 3PL providers commonly offer advanced logistics services that are not originally attributable to the logistics functions, but rather to financing, consultation and production or IT-related activities. This may imply that a wider range of stakeholders pursue more conflicting interests towards the company. Therefore, 3PL providers with advanced logistics service offerings may be confronted with contradictory stakeholder demands and concerns, which impede the adoption of environmental practices. Conversely, 3PL providers with basic logistics services may face more unisonous demands of stakeholders and thus may adopt environmental practices more strictly.

As a result, we argue that 3PL providers of basic versus advanced logistics service offerings will handle the perceived stakeholder pressures in different ways. As a consequence, we hypothesize that:

H1 The complexity of service offerings moderates the relationship between perceived stakeholder pressures and environmental practice adoption, such that the relationship is weaker for 3PL providers with advanced logistics service offerings.

3.2 Environmental practice adoption and economic performance

As outlined above, research on the relationship between environmental practice adoption and economic performance has produced mixed findings. The majority of the existing studies however support a generally positive relationship (Dixon-Fowler et al. 2013). The primary argument in this line of research is that a superior adoption of environmental practices can be a source of competitive advantage, which can help improve economic performance (Hart 1995; Delmas and Toffel 2004; Bocquet et al. 2013). Environmental practices cover, among others, practices that aim to minimize waste generation, effluents and emissions, as well as environmental sustainability efforts across firm boundaries. On the one hand, environmental practices that are geared towards continuously improving operational processes can help to significantly reduce costs (Hart 1995). This eco-efficiency argument is based on the notion that waste, effluents and emissions are considered as an inefficient use of resources and thus represent unnecessary costs for the firm (Porter and Van der Linde 1995; Christmann 2000). On the other hand, environmental practices might lead to reputational benefits, which result in social legitimacy (Hart 1995), the ability to attract and retain highly-qualified employees (Turban and Greening 1997) and a lower liability risk (Porter and Van der Linde 1995; Reuter et al. 2010). However, such practices only offer competitive value if they cannot be easily imitated and substituted by competitors (Barney 1991). In order to implement effective environmental practices, cross-disciplinary collaboration, management support, and company-wide coordination efforts are required. This is especially true when implementing a set of practices and not only individual ones (Russo and Fouts 1997). Such environmental practice bundles are socially complex and built on tacit skills that are spread throughout the entire organization and embedded in hard-to-copy organizational routines (Hart 1995; Halldorsson et al. 2007). Cooperative efforts across functional silos are especially non-transparent to competitors, creating barriers to imitation by means of causally ambiguous resources and capabilities that are vital to competitive advantages and hence to economic performance (Klassen and Whybark 1999).

Following a contingency perspective, we argue that the complexity of service offerings will influence the leverage of environmental practices on economic performance. As 3PL providers with advanced service offerings take over difficult to imitate coordinative and administrative responsibility for their customers, it is reasonable to assume that these tasks might stronger affect economic performance than adapting individual practices (Aragón-Correa and Sharma 2003; Branco and Rodrigues 2006; Claver et al. 2007). Conversely, because 3PL providers with basic service offerings predominately operate with standardized and isolated logistics services, there is a higher likelihood that competitors can imitate individual environmental practices of these providers. As a result, the effect of environmental practice adoption on economic performance might be weaker for 3PL providers

with basic service offerings compared to 3PL providers with advanced service offerings.

As a second argument, Sink and Langley (1997) show that shippers apply different selection criteria when sourcing basic logistics services compared to more complex bundled logistics services (advanced service offerings). According to them, applying more rigorous screening processes and an evaluation of potential candidates based on qualitative factors such as 3PL providers' reputation play a major role in sourcing advanced logistics services, but not in sourcing basic logistics services (Cullinane and Edwards 2010). In line with this, Andersson and Norrman (2002) state that the purchasing process for basic logistics services is largely structured around price, while the process for purchasing advanced logistics services is more likely to include further criteria. Therefore, in this context, providers of basic logistics services may only benefit from the cost-saving potential of the employed environmental practices, but not from the reputational benefits that providers of advanced logistics services may achieve. Based on these arguments, we hypothesize that:

H2 The complexity of service offerings moderates the relationship between environmental practice adoption and economic performance, such that the relationship is stronger for 3PL providers with advanced logistics service offerings.

Finally, we rely on firm size as a control variable in our structural model because prior research has reported that firm size influences the pressure-response-outcome relationship (Darnall et al. 2010; Delmas et al. 2011). Our entire model, including our different research hypotheses, is illustrated in Fig. 2.

4 Research methodology

A survey research design was chosen for its strengths in testing newly established theories, measuring adopted and modified constructs as well as collecting the perceptual, quantitative data required to apply complex path modeling (McCarthy-Byrne and Mentzer 2011). The selected sample was limited to the 3PL industry to better understand the dynamics in a so-far unexplored, but highly relevant area in sustainable supply chain management and to provide empirical evidence as to why firms that belong to the same institutional environment implement different response strategies (e.g. environmental practices) to perceived stakeholder pressures. Moreover, transportation services, which have taken a central role in the logistics systems of corporations competing in global markets in the 21st century, increasingly affect the physical environment (air, water, and land resources) (Wolf and Seuring 2010; Colicchia et al. 2013).

4.1 Research instrument and sampling

To collect empirical data, we developed an online survey instrument. Before conducting our large-scale survey, we pre-tested the questionnaire by consulting seven logistics practitioners and five logistics researchers, all of who were familiar

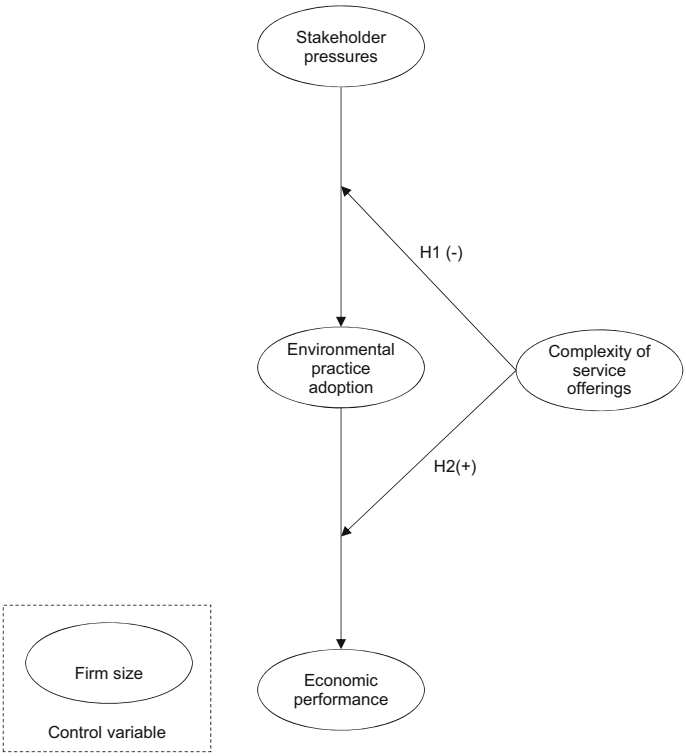

Fig. 2 Research model and hypotheses

with the concepts of sustainability. After refining our questionnaire for comprehensibility, we initiated our study.

The respondents from German 3PL providers who participated in our study were in the majority of cases the CEO, managing director, or head of logistics operations. We asked these initial survey respondents to forward the questionnaire to the chief sustainability officer if applicable. Our initial contact list contained all 9301 German 3PL providers listed in Hoppenstedt's extensive corporate database of more than 300,000 corporate profiles from Germany. Subsequently, we drew a random sample of 2000 3PL providers. This list was subsequently reduced by 128 3PL providers since no email address could be identified for 101 companies and since another additional 27 firms did not conduct logistics operations as defined. These companies were excluded from our survey and 1872 3PL providers were thus contacted. A total of 202 usable responses were received, resulting in a response rate of 10.8%, a rate comparable to other studies within the field of sustainability research (e.g. Paulraj 2011). However, as ten respondents have not answered the questions concerning perceived stakeholder pressures, we excluded them from our sample. This resulted in a total sample of 192 cases.

In order to further assure the accuracy and generalizability of our study's findings, we employed two different non-response tests on our data (Wagner and

Kemmerling 2010). First, a potential non-response bias was tested for by comparing the mean scores of the first quartile of responses to the mean scores of the last quartile of responses based on chronologically ordering the responses according to the date they were received (Zhao et al. 2001). The results of the calculated independent t-tests showed no statistical differences ($p < 0.05$) between the ratings of early respondents and the ratings of late respondents for 30 of the 31 items that were deployed in our measurement model (please see Table 1). In a second test, we compared our study's respondents to the non-respondents by using information on characteristics known a priori (Wagner and Kemmerling 2010). We employed Chi square tests to compare the distribution of companies across different industry subsectors of the 3PL industry and across different types of legal structures. The information was derived from Hoppenstedt's corporate database. The Chi square tests showed no statistically significant distributional differences ($p < 0.05$) between respondents and non-respondents. Accordingly, both tests suggest that non-response bias is not a major concern in our study.

4.2 Measures

All questionnaire items were measured on a seven-point Likert-type scale, with the exception of background information on 3PL providers and respondents. The constructs of stakeholder pressures and environmental practices were operationalized as second-order constructs, with their first-order measurement models serving as formative indicators. All latent variables from the first-order model were measured by multiple reflective indicators. The constructs, items, item descriptions and the descriptive statistics are shown in detail in Table 1.

In line with previous research, we included different governmental regulations (regulatory pressure), customers and competitors (market pressure), trade associations, environmental interest groups and the general public (social pressure), and employees and top managers (internal pressure) as stakeholder pressure sources in our survey and adopted the measurement items for these pressure sources from the studies of Carter and Carter (1998), Hall and Wagner (2012), and Murillo-Luna et al. (2008). Furthermore, we added an item for attracting future employees based on previous research by Turban and Greening (1997). Shareholders were not included as a stakeholder group because many of the firms that participated in our study are privately held.

Environmental practice adoption was operationalized by relying on the green supply chain management concept of Zhu and Sarkis (2004), which consists of internal, eco-design, external, and investment recovery practices. Internal practices refer to top management support for environmental targets, while eco-design practices aim at minimizing waste, effluents and emissions. External practices consist of environmental sustainability efforts across firm boundaries and finally, investment recovery practices refer to selling manufacturing scrap. Due to the non-manufacturing-based character of 3PL operations, investment recovery practices are not relevant in our context. Based on our previous research on 3PL providers, we relabeled the different categories of environmental practices according to Hart (1995) and Maas et al. (2014), who distinguish between "pollution prevention" (i.e. eco-design practices) and "service stewardship" (i.e. external practices). The term

Table 1 Constructs, items, item descriptions and descriptive statistics

Construct/ item	Item description	Mean	sd	Min	Max
Stakeholder pressures (STAPR)					
Regulatory pressure (REPR)					
REPR1	National environmental regulation	5.634	1.623	1.0	7.0
REPR2	European environmental regulation	5.245	1.804	1.0	7.0
REPR3	Future environmental regulation	4.401	1.764	1.0	7.0
Market pressure (MAPR)					
MAPR1	Customer demand	5.172	1.714	1.0	7.0
MAPR2	New customers	5.115	1.620	1.0	7.0
MAPR3	Imitate competitors' efforts	4.458	1.766	1.0	7.0
MAPR4	Differentiate from competitors	5.443	1.633	1.0	7.0
Social pressure (SOPR)					
SOPR1	General public	3.615	1.813	1.0	7.0
SOPR2	Industry associations	3.555	1.820	1.0	7.0
SOPR3	Environmental interest groups	4.521	1.804	1.0	7.0
Internal pressure (INPR)					
INPR1	Interest of top management/owners	4.776	1.751	1.0	7.0
INPR2	Employee motivation	4.922	1.781	1.0	7.0
INPR3	Attractiveness for prospective employees	4.749	1.704	1.0	7.0
Environmental practice adoption (ENVPA)					
Supportive practices (SUPPA)					
SUPPA1	Top management support for environmental targets	4.419	1.977	1.0	7.0
SUPPA2	Incentive system	3.917	1.877	1.0	7.0
SUPPA3	Total quality environmental management	4.822	1.789	1.0	7.0
SUPPA4	Auditing and compliance programs	3.500	1.746	1.0	7.0
SUPPA5	Cross-functional environmental projects	4.000	1.822	1.0	7.0
Pollution prevention practices (POPPA)					
POPPA1	Measures to increase recycling of materials	4.858	1.910	1.0	7.0
POPPA2	Measures to reduce usage of fossil fuels	5.324	1.704	1.0	7.0
POPPA3	Measures to reduce greenhouse gas emissions	4.319	1.976	1.0	7.0
POPPA4	Measures to reduce energy consumption in logistics facilities	5.432	1.756	1.0	7.0
POPPA5	Measures to reduce energy consumption in transport operations	5.220	1.760	1.0	7.0
Service stewardship practices (SESPA)					
SESPA1	Cooperation with customers for environmentally-friendly product design	4.141	1.883	1.0	7.0
SESPA2	Cooperation with customers for environmentally-friendly logistics	3.598	2.002	1.0	7.0
SESPA3	Cooperation with customers for environmentally-friendly service provision	3.058	1.742	1.0	7.0
SESPA4	Cooperation with customers for environmentally-friendly packaging	4.663	1.900	1.0	7.0

Table 1 continued

Construct/ item	Item description	Mean	sd	Min	Max
Performance outcome					
Economic performance (ECONPF)					
ECONPF1	Profit margin	3.438	1.671	1.0	7.0
ECONPF2	Level of costs	3.586	1.540	1.0	7.0
ECONPF3	Rate of revenue growth	3.630	1.763	1.0	7.0
ECONPF4	Reputation	4.670	1.623	1.0	7.0

All items are measured with a seven-point Likert-type scale, where 1 = strongly disagree and 7 = strongly agree

"internal practices" refers merely to a supportive top management function and is thus strictly speaking not an environmental practice. However, as we apply a second-order partial least square model based on a formative measurement, we also included this dimension in order to be collectively exhaustive—a prerequisite for formative measured latent variables. Finally, we adapted the wording of the items introduced by Zhu and Sarkis (2004) to the 3PL context. For example, by referring to logistics processes instead of referring to products. An item for greenhouse gas emission levels was also added (item POPPA3) because they emerged as a key driver of 3PL operations' environmental impact in previous studies (Lieb and Lieb 2010; Wolf and Seuring 2010).

Our operationalization of economic performance was also based on primary data because secondary data were unavailable for many of the privately held firms that participated in our study. However, the managerial assessment of economic performance has been shown to highly correlate with the objective secondary data (Dess and Robinson 1984). In line with previous research, we deployed items for profit margin, costs, revenue growth and reputation in order to perceptually capture economic performance (e.g. Cho et al. 2008; Rao et al. 2009). Firm size was measured based on 3PL providers' annual revenues. Finally, we operationalized the complexity of service offerings by asking the respondents to indicate in which areas the core business of the company lay. We distinguished between two different groups, with the first being companies whose core business lie in management and execution of standardized logistics services with a focus on transportation and warehousing (Group A = 3PL providers with basic service offerings). The second group consists of companies whose core business lie in customized and bundled services covering inventory management, contract logistics services, coordinative tasks, information-related activities, such as tracking and tracing, and value added supply chain activities, such as secondary assembly, inventory financing IT services and installation of products (Group B = 3PL providers with advanced service offerings).

4.3 Common method bias

Research studies that rely on data collected from a single respondent face the possibility that the employed manifest variables share a certain level of spurious

covariance that might affect the interpretability of the results (Craighead et al. 2011). Therefore, we followed several recommendations suggested by Podsakoff et al. (2003) and Chang et al. (2010). From an ex-ante perspective, we assured complete anonymity to all respondents and separated independent and dependent constructs in the questionnaire. Moreover, we varied formats for the predictor and criterion measures in order to minimize potential consistency. Finally, we asked the participants to answer all questions from their firm's perspective and not based on their own personal opinions and values concerning sustainability issues (Fisher 1993). From a post hoc perspective, we computed an exploratory factor analysis and examined the unrotated factor solutions by means of the commonly used Harman single factor test (Harman 1976; Podsakoff and Organ 1986). Based on the unrotated factor solutions, neither a single factor nor a general factor accounting for the majority of the covariance emerged in this study. Moreover, we applied Lindell and Whitney's (2001) post hoc marker variable test of common method variance (CMV), which does not require researchers to identify a marker variable a priori. Accordingly, Lindell and Whitney (2001, p. 115) state that "the smallest correlation among the manifest variables provides a reasonable proxy for CMV." However, it has been suggested that the second-smallest positive correlation should be used as a more conservative measure of CMV (Malhotra et al. 2006). The value of the second-smallest correlation coefficient in our study was 0.006, constituting a very small correlation between the manifest variables SOPR2 (industry associations that exert pressure on environmental practice adoption) and ECONPF1 (profit margin as an economic outcome). Taken together, these two tests suggest that a common method bias is not a major concern in our study.

5 Results

To estimate our model, we applied a partial least squares (PLS) path modeling approach based on SmartPLS version 3.2.4 (Ringle et al. 2015). PLS path modeling enabled us to exceed the analysis of individual relationships in order to test the normative implications of the total system of stakeholder pressures, environmental practices, and economic performance (Meznar and Nigh 1995). A variance-based approach was favored over a covariance-based approach due to the non-multivariate normality of data combined with a sample size below 200 observations to avoid non-convergence and improper solutions (Reinartz et al. 2009). The inclusion of both formative and reflective measures also encouraged us to further rely on a variance-based approach (McCarthy-Byrne and Mentzer 2011).

To the best of our knowledge, no accepted single goodness-of-fit measure exists for the evaluation of PLS models, which is why multiple measures are commonly used to evaluate the measurement and the structural model (McCarthy-Byrne and Mentzer 2011; Henseler and Sarstedt 2013). Therefore, we initially tested for the construct validity of the higher-order models. We then assessed the measurement model in terms of individual item reliability, convergent validity, and discriminant validity. Subsequently, we evaluated the structural model in terms of the standardized path coefficients and their significance levels, the coefficients of

determination (R^2) for the endogenous variables, the effect sizes of exogenous variables on endogenous variables (f^2), and the predictive relevance of the structural model (Q^2).

5.1 Construct validity for higher-order constructs

To assess the construct validity of distinct stakeholder pressures and environmental practices, we conducted an exploratory factor analyses with varimax rotation in SPSS 23.0 for all stakeholder pressures and environmental practices constructs (de Winter et al. 2009). Table 2 shows the presence of four distinct first-order stakeholder pressures factors: regulatory, market, social and internal pressure. All item loadings on the respective factors are well above the suggested minimum threshold of 0.32 (Giunipero and Pearcy 2000) and are also in line with prior research (Hall and Wagner 2012), thus providing evidence for the construct validity of these constructs. Concerning environmental practices, the three anticipated factors of supportive, pollution prevention, and service stewardship practices were derived from our factor analysis as shown in Table 3. All item loadings are also above the suggested minimum cut-off point of 0.32. However, for item SUPPA5,

Table 2 Exploratory factor analysis for stakeholder pressures

Rotated component matrix		Component			
		Regulatory pressure	Market pressure	Social pressure	Internal pressure
REPR2	European environmental regulation	0.926			
REPR1	National environmental regulation	0.906			
REPR3	Future environmental regulation	0.612			
MAPR3	Imitate competitors' efforts		0.791		
MAPR2	New customers		0.773		
MAPR1	Customer demand		0.756		
MAPR4	Differentiate from competitors		0.683		
SOPR2	Industry associations			0.922	
SOPR1	General public			0.919	
SOPR3	Environmental interest groups			0.660	0.465
INPR2	Employee motivation				0.898
INPR1	Interest of top management/ owners				0.890
INPR3	Attractiveness for prospective employees			0.413	0.444
Eigenvalue		2.244	2.622	2.587	2.344
Explained variance in %		17.263	20.172	19.889	18.3032

For reading purposes all item loadings below 0.4 were excluded from this table

Table 3 Exploratory factor analysis for environmental practice adoption

Rotated component matrix		Component		
		Pollution prevention practices	Service stewardship practices	Supportive practices
POPPA1	Measures to increase recycling of materials	0.774		
POPPA2	Measures to reduce usage of fossil fuels	0.751		
POPPA4	Measures to reduce energy consumption in logistics facilities	0.715		
POPPA5	Measures to reduce energy consumption in transport operations	0.702		
POPPA3	Measures to reduce greenhouse gas emissions	0.657		
SESPA2	Cooperation with customers for environmentally-friendly logistics		0.819	
SESPA1	Cooperation with customers for environmentally-friendly product design		0.810	
SESPA3	Cooperation with customers for environmentally-friendly service provision		0.777	
SESPA4	Cooperation with customers for environmentally-friendly packaging		0.649	
SUPPA5	Cross-functional environmental projects[a]	0.480	0.453	0.475
SUPPA1	Top management support for environmental targets			0.849
SUPPA2	Incentive system			0.793
SUPPA3	Total quality environmental management			0.674
SUPPA4	Auditing and compliance programs			0.568
Eigenvalue		3.444	3.012	2.712
Explained variance		24.602	21.515	19.372

[a] Item was excluded from further analysis due to its low item loading and its large cross loadings; for reading purposes all item loadings below 0.4 were excluded from this table

the implementation of cross-functional environmental projects, we found large cross-loadings on both pollution prevention and service stewardship practices. Therefore, this item was removed from further analysis.

5.2 Measurement model

To ensure individual item reliability, the standardized outer loadings of the manifest variables were inspected. A widely used threshold level for the suitability of the outer loadings is 0.707, as a minimum of 50% of the item's variance can then be explained by the corresponding latent variable (Henseler et al. 2009). As Table 4 indicates, the item loadings of 27 out of 30 items were above this threshold. Since

Table 4 Results for measurement model of first-order model

Construct/ item	Item description	IL/IW	AVE	CR	Alpha
Stakeholder pressures (STAPR)					
Regulatory pressure (REPR)		*0.216*	0.693	0.871	0.798
REPR1	National environmental regulation	0.803			
REPR2	European environmental regulation	0.847			
REPR3	Future environmental regulation	0.846			
Market pressure (MAPR)		*0.442*	0.696	0.901	0.852
MAPR1	Customer demand	0.886			
MAPR2	New customers	0.898			
MAPR3	Imitate competitors' efforts	0.818			
MAPR4	Differentiate from competitors	0.724			
Social pressure (SOPR)		*0.147*	0.780	0.914	0.856
SOPR1	General public	0.921			
SOPR2	Industry associations	0.930			
SOPR3	Environmental interest groups	0.791			
Internal pressure (INPR)		*0.511*	0.730	0.889	0.806
INPR1	Interest of top management/owners	0.927			
INPR2	Employee motivation	0.917			
INPR3	Attractiveness for prospective employees	0.699			
Environmental practice adoption (ENVPA)					
Supportive practices (SUPPA)		*0.493*	0.621	0.866	0.794
SUPPA1	Top management support for environmental targets	0.864			
SUPPA2	Incentive system	0.775			
SUPPA3	Total quality environmental management	0.830			
SUPPA4	Auditing and compliance programs	0.668			
Pollution prevention practices (POPPA)		*0.471*	0.588	0.887	0.825
POPPA1	Measures to increase recycling of materials	0.759			
POPPA2	Measures to reduce usage of fossil fuels	0.810			
POPPA3	Measures to reduce greenhouse gas emissions	0.735			
POPPA4	Measures to reduce energy consumption in logistics facilities	0.784			
POPPA5	Measures to reduce energy consumption in transport operations	0.744			
Service stewardship practices (SESPA)		*0.270*	0.705	0.905	0.859
SESPA1	Cooperation with customers for environmentally-friendly product design	0.902			
SESPA2	Cooperation with customers for environmentally-friendly logistics	0.894			
SESPA3	Cooperation with customers for environmentally-friendly service provision	0.779			
SESPA4	Cooperation with customers for environmentally-friendly packaging	0.776			

Table 4 continued

Construct/ item	Item description	IL/IW	AVE	CR	Alpha
Performance outcome					
Economic performance (ECONPF)			0.596	0.853	0.771
ECONPF1	Profit margin	0.854			
ECONPF2	Level of costs	0.624			
ECONPF3	Rate of revenue growth	0.865			
ECONPF4	Reputation	0.719			

IL item loading, *IW* indicator weight (second-order model), *AVE* average variance extracted, *CR* composite reliability, *Alpha* Cronbach's alpha

the lowest loading of any item in the study was 0.624 (ECONPF2) and because Hulland (1999) postulates a minimum loading of 0.5 before an item should definitively be dropped, no item was removed from the measurement model.

Composite reliability scores, Cronbach's alphas and the average variance extracted (AVE) are commonly used to test for convergent validity in PLS modeling, in other words to assess how well manifest variables represent an associated latent variable (Henseler et al. 2009). As shown in Table 4, all composite reliability scores and Cronbach's alphas are well above the suggested minimum value of 0.7 (Nunally and Bernstein 1994). The AVE measures the amount of indicator variance that is explained by a given construct. A value of 0.5 is commonly seen as sufficient because in that case, variance due to measurement error is smaller than variance captured by the construct (Fornell and Larcker 1981). All AVE scores were well above the suggested satisfactory threshold, as shown in Table 4.

Contrary to convergent validity, discriminant validity measures the degree to which the operationalization of a given construct differs from other employed constructs (Henseler et al. 2009). On an indicator level, discriminant validity exists when the loadings of all manifest variables are the highest with their corresponding latent variable (Hair et al. 2011). This requirement could be met in our study because all item cross-loadings were lower than the loadings with the corresponding latent variable. At the construct level, discriminant validity can be assessed by applying the Fornell–Larcker criterion (Henseler et al. 2009). Accordingly, the square roots of all latent variables' AVE values were compared to the latent variables' correlations with all other latent variables in the model. Table 5 indicates that the Fornell–Larcker criterion was met because these correlations were lower than the respective square root of the latent variables' respective AVE values. Subsequently, we employed a two-stage approach as recommended by Hair et al. (2016) and used the latent variable scores of each of the first-order constructs, which were computed by SmartPLS 3.2.4 (Ringle et al. 2015), as formative indicators of our second-order constructs of stakeholder pressures and environmental practices.

Table 5 Latent variable correlations and Fornell–Larcker criterion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Theoretical variables									
(1) Regulatory pressure	*0.832*								
(2) Market pressure	0.223	*0.834*							
(3) Social pressure	0.234	0.424	*0.883*						
(4) Internal pressure	0.285	0.538	0.377	*0.854*					
(5) Supportive practices	0.303	0.567	0.440	0.512	*0.788*				
(6) Pollution prevention practices	0.341	0.484	0.318	0.575	0.470	*0.767*			
(7) Service stewardship practices	0.226	0.419	0.247	0.468	0.411	0.533	*0.840*		
(8) Economic performance	0.026	0.145	0.140	0.273	0.271	0.321	0.336	*0.772*	
Control variable									
(9) Firm size	0.039	0.097	0.011	0.127	0.050	0.130	0.164	0.054	

Italic numbers in the diagonal of Table 2 are the square root of the AVE

5.3 Second-order model

To evaluate the higher-order constructs, we examined formative indicator weights and their significance levels based upon running SmartPLS's bootstrapping algorithm with 1000 samples and 192 cases (Henseler et al. 2009). All indicator weights for the different types of stakeholder pressures are significant ($p < 0.01$), except for social pressure ($p = 0.51$) (see Fig. 3). The corresponding indicator weights for regulatory, market, social and internal pressure are 0.216, 0.442, 0.147, and 0.511 respectively. However, since theoretical considerations are important for the assessment of the suitability of formative indicators, the sole insignificance of a given formative indicator alone does not suffice to determine its exclusion from further PLS analyses (Hair et al. 2011). Consequently, we did not remove social pressure from our analysis because it constitutes a theoretically relevant pressure type (Mitchell et al. 1997). Moreover, all three environmental practice adoption indicator weights for supportive ($b = 0.493$), pollution prevention ($b = 0.471$), and service stewardship practices ($b = 0.270$) were found to be significant ($p < 0.01$) (see Fig. 3).

We also tested for multicollinearity among the formative indicators using the variance inflation factor scores (1.014–1.017), demonstrating that multicollinearity was not an issue in our study (Diamantopoulos and Winklhofer 2001).

Subsequently, we compared our second-order model as displayed in Fig. 3 to an alternative model without the second-order constructs by including direct paths from the four stakeholder pressure constructs to the environmental practice variables and from the three environmental practice variables to economic performance. Our findings are illustrated in Table 6. We found that the path coefficients and t-statistics were consistently stronger for our higher-order model compared to our first-order model. Additionally, we found that nine path

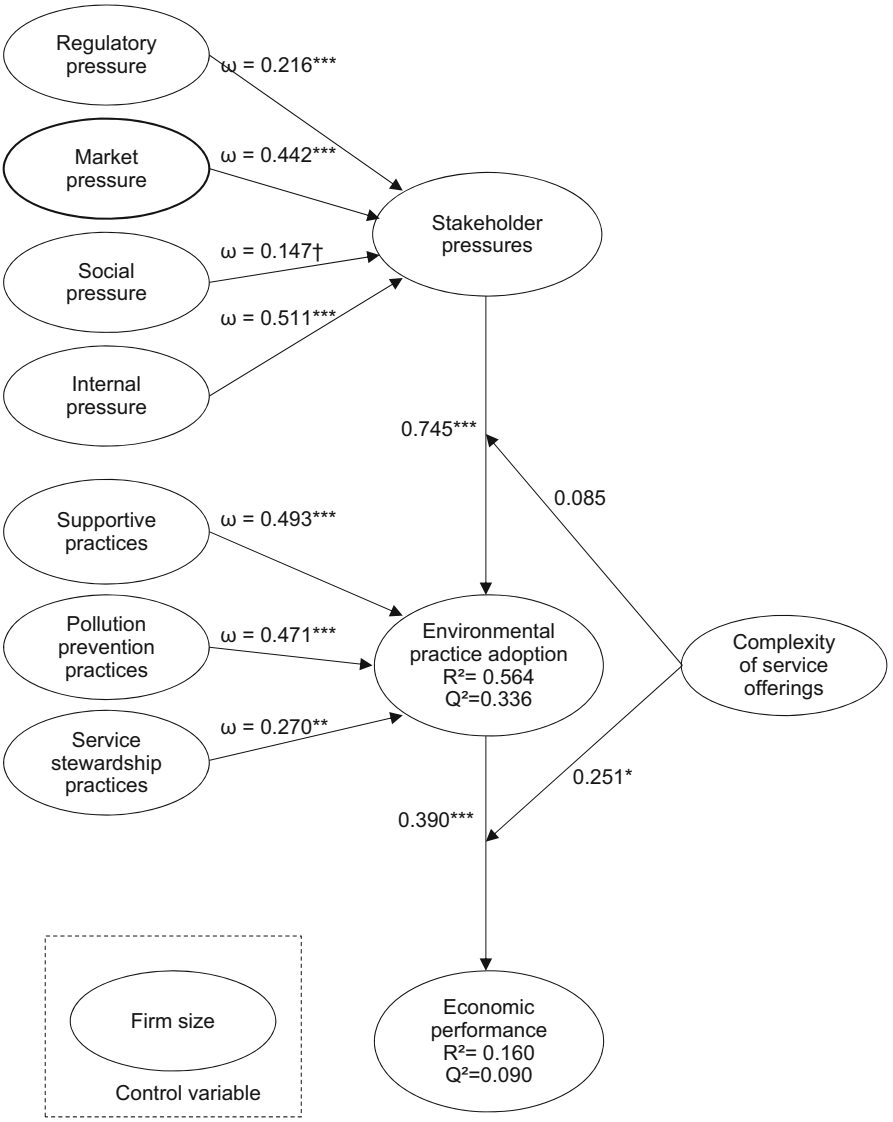

Fig. 3 Results of structural equation model for the full model

coefficients were not significant when operationalized as first-order latent variables. Hence, our results render support to operationalizing stakeholder pressures and environmental practice adoption as higher-order constructs. Finally, we calculated the effect sizes (f^2) to evaluate the effects of exogenous on endogenous variables (Cohen 1992) (see Table 6).

Table 6 Comparison of first-order and second-order model

With second-order LV				Without second-order LV			
Relationship	Path coeff.	t-VALUE	f^2-value	Relationship	Path coeff.	t-value	f^2-value
STAPR → ENVPA	0.745***	17.863	1.253	REPR → SUPPA	0.295***	3.864	0.179
				REPR → POPPA	0.197**	2.782	0.070
				REPR → SESPA	0.048	0.517	0.017
				MAPR → SUPPA	0.321**	3.219	0.150
				MAPR → POPPA	0.248**	2.775	0.078
				MAPR → SESPA	0.437***	4.375	0.206
				SOPR → SUPPA	0.123	1.344	0.027
				SOPR → POPPA	−0.089	1.011	0.012
				SOPR → SESPA	−0.102	1.103	0.014
				INPR → SUPPA	0.284**	3.258	0.123
				INPR → POPPA	0.498***	5.957	0.333
				INPR → SESPA	0.315**	2.614	0.113
ENVPA → ECONPF	0.390***	4.812	0.178	SUPPA → ECONPF	−0.018	0.101	0.000
				POPPA → ECONPF	0.285*	1.983	0.050
				SESPA → ECONPF	0.136	0.840	0.011
FIRM SIZE → ENVPA	0.042	1.113	0.003	FIRM SIZE → SUPPA	−0.004	0.084	0.000
				FIRM SIZE → POPPA	0.026	0.810	0.001
				FIRM SIZE → SESPA	0.096**	2.959	0.016
FIRM SIZE → ECONPF	0.054†	1.338	0.004	FIRM SIZE → ECONPF	0.082	1.285	0.008

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

5.4 Structural model and effects

To assess the quality of our model, we first looked at the R^2-values. While the explained variance for environmental practice adoption ($R^2 = 0.564$) is quite high, only 16% of the variance for economic performance ($R^2 = 0.160$) is explained in our model (Henseler et al. 2009). At first glance, the R^2-value for economic performance ($R^2 = 0.160$) seems to be somewhat low (see Fig. 3). However, we did not expect environmental practice adoption to explain the entire variance of economic performance. Prior studies for instance have highlighted that the economic performance of firms is dependent on a broad set of strategic capabilities such as IT and innovation capabilities, which are beyond the scope of our analysis (Newbert 2007).

Second, we evaluated the predictive relevance of the structural model by applying Stone–Geisser's Q^2-criterion, which was calculated based upon blind-folding procedures. The Q^2-values for environmental practices ($Q^2 = 0.336$) and for economic performance ($Q^2 = 0.090$) were above zero, emphasizing the predictive relevance of the structural model (Henseler et al. 2009) (see Fig. 3).

In a final step, we considered the levels of significance of the estimated parameters by evaluating the t-values and the derived p-values respectively (see Table 6). As Fig. 3 depicts, our results show that the perception of stakeholder pressures has a strong and positive effect on 3PL providers' environmental practice adoption ($b = 0.745$, $p < 0.001$) and between environmental practices and economic performance ($b = 0.390$, $p < 0.001$).

To test our hypotheses, we conducted a multi-group analysis, which is especially useful for categorical moderator variables (Eberl 2010). The multi-group analysis allowed us to test if pre-defined data groups had significant differences in their group-specific parameter estimates (Sarstedt et al. 2011). We applied Henseler's (2012) non-parametric PLS-based approach to multi-group analysis to test between-group differences in standardized path coefficients for their statistical significance. The result serves as an indicator of the probability in the general population that a given parameter is significantly larger in the first group than in the second group (Henseler 2012). Table 7 illustrates the estimated values for the standardized path coefficients for the full model and the two subgroups. It also shows the respective levels of statistical significance for the group-specific path coefficients, as well as the statistical significance of group differences between the path coefficients of Group A (basic logistics services) and Group B (advanced logistics services).

The explanatory power of the group-specific structural models is examined by looking at the coefficients of determination (R^2) of the endogenous variables. While the R^2 values for environmental practices are quite similar between Group A ($R^2 = 0.628$) and Group B ($R^2 = 0.517$), we can observe larger differences of the R^2-values for economic performance between Group A ($R^2 = 0.308$) and Group B ($R^2 = 0.098$) (see Fig. 4). This means that environmental practice adoption is a better predictor for economic performance of 3PL providers with basic logistics services than of 3PL providers with advanced logistics services.

In terms of the hypothesized moderating effects, the results indicate that stakeholder pressures lead to a higher level of environmental practice adoption for

Table 7 Partial least squares modeling results for group comparisons

Path coefficient	Full model	Group A[a]	Group B[b]	Difference between Group A and B
STAPR → ENVPA	0.745***	0.788***	0.703***	0.085
ENVPA → ECONPF	0.390***	0.541***	0.290*	0.251*
FIRM SIZE → ENVPA	0.042*	0.053	0.075	0.022
FIRM SIZE → ECONPF	0.054†	0.083	0.077	0.006

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p < 0.10$

[a] Group A = 3PL providers offering basic logistics services with a transportation focus (n = 97)

[b] Group B = 3PL providers offering advanced logistics services (n = 95)

3PL providers with basic logistics services ($b = 0.788$, $p < 0.001$) compared to 3PL providers with advanced logistics services ($b = 0.730$, $p < 0.001$). However, the employed non-parametric significance test shows that the path coefficients between Group A and B are not significantly different from each other (0.085, $p > 0.10$) (see Table 7). As a result, we did not find statistical support for the moderating role of complexity of service offerings between stakeholder pressures and environmental practice adoption and thus, must reject hypothesis 1.

In hypothesis 2, we argued that the relationship between environmental practice adoption and economic performance will be stronger for 3PL providers with advanced service offerings. As shown in Fig. 4, the results reveal that the effect of environmental practice adoption on economic performance is lower for 3PL providers with advanced service offerings ($b = 0.290$, $p < 0.05$) than for 3PL providers with basic service offerings ($b = 0.541$, $p < 0.001$)—being contradictory to our hypothesis. The employed non-parametric significance test shows that the path coefficients between Group A and B are significantly different from each other (0.251, $p < 0.05$), thus hypothesis 2 is not supported (see Fig. 4; Table 7). Fuel is a large cost driver in transport operations, accounting for up to 35% of the total vehicle operating costs (McKinnon, 2010). Therefore, measures to reduce energy consumption in transport operations, such as eco-training for drivers or modifying trucks to improve their drag coefficient, have very direct performance effects and enable 3PL providers to offer low-cost transportation services to their clients. In comparison, the direct economic performance outcomes of the adoption of environmental practices in performing advanced logistics services are much lower. This also seems to contribute to the fact that less variance in the latent variable for economic performance can be explained for the group of providers that offer advanced logistics services (9.8% compared to 30.8% for 3PL providers with basic logistics services).

6 Discussion and implications

There are two interesting and counterintuitive results which should be further discussed and which make a contemporary contribution to the knowledge in the field. First, the study deepens our understanding of the relationship between

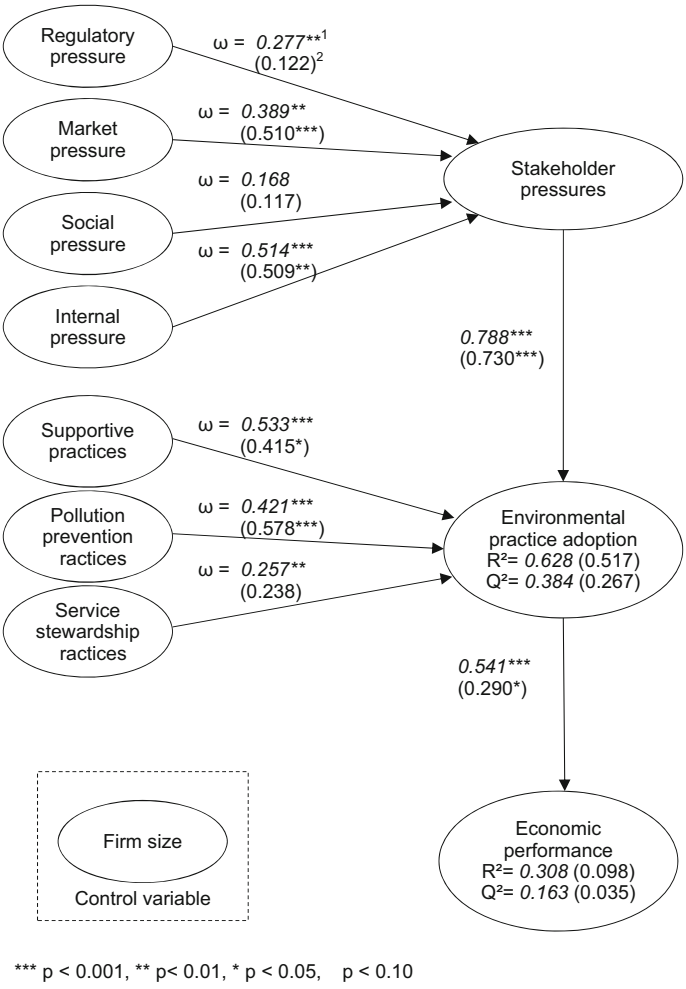

Fig. 4 Results of structural equation model for Group A and Group B. [1]italic values for Group A = 3PL providers offering basic logistics services (n = 97); [2]Values in parenthesis for Group B = 3PL providers offering advanced logistics services (n = 95)

perceived stakeholder pressures and environmental practice adoption. Our study shows that the standard deviations of the individual pressure items (regulatory, market, social and internal pressures) range from 1.620 to 1.820 (see Table 1), supporting the fact that 3PL providers perceive these diverse pressures differently while competing within the same institutional environment. Moreover, the results show that regulatory, market, social and internal pressures have a differing impact on perceived stakeholder pressures (Fig. 3). We can observe that internal pressure has by far the highest impact on stakeholder pressures ($\omega = 0.511***$), whereas social pressure has no significant impact on stakeholder pressures ($\omega = 0.147$). These results contradict the findings of Murillo-Luna et al. (2008) and Sprengel and

Busch (2011), as our results do not support the fact that 3PL providers perceive only one dimension of stakeholder pressures for environmental practice adoption, since the perceived importance of the diverse stakeholder pressure types differs highly within our second-order model. Our results thus suggest that 3PL providers distinguish among different pressure categories to determine their response choices, which is further supported by the different impacts of the perceived stakeholder pressure variables on the environmental practice variables in our first-order model, as illustrated in Table 6. Moreover, our results provide evidence that perceived stakeholder pressures strongly influence the adoption of environmental practices in the 3PL industry. Interestingly, our results do not provide significant evidence that the effects of perceived stakeholder pressures on environmental practice adoption differ as a function of complexity of service offerings. Thus, our argumentation that higher resource constraints and a lower diversity of stakeholders result in a stronger effect of perceived stakeholder pressures on environmental service adoption for basic 3PL providers does not find support. The non-significant findings may instead indicate that, even though basic 3PL providers may be exposed to higher resource constraints and have to deal with more homogenous stakeholder demands, they may have developed certain capabilities, which help them to better withstand the stakeholder pressure they perceive. In fact, there is evidence from the literature on corporate strategy that organizations pursuing a cost leadership strategy can better cope with external pressure than companies pursuing a differentiation strategy, as those companies focus more on the creation of internal efficiencies and the protection of their domain (Kumar and Subramanian 1997).

Second, our results provide evidence for a positive relationship between environmental practice adoption and economic performance for the German 3PL industry and is thus in line with the majority of existing studies that support a generally positive relationship (Dixon-Fowler et al. 2013). Moreover, the results show that the complexity of service offerings is a meaningful firm-related contingent variable that significantly impacts the relationship between environmental practice adoption and economic performance. However, contrary to hypothesis 2, we found that the effect of environmental practice adoption on economic performance is stronger for 3PL providers of basic service offerings. One possible explanation is related to the market mechanisms of different competitive strategies. As argued, the complexity of service offerings widely determines the competitive strategy of 3PL providers. While 3PL providers with advanced service offerings build their business model on customized and differentiated services, basic 3PL providers offer cost-efficient and widely standardized logistics services. Thus, being seen as an eco-friendly company as a result of the implemented environmental practices only represents an additional differentiation criterion for 3PL providers with advanced logistics services. As customers already value other differentiation criteria of those providers, they may not be willing to pay an extra fee for the environmental practice adoption—indicating a diminishing marginal utility of differentiation criteria. Conversely, it can be argued that the adoption of environmental practices may enable 3PL providers with basic service offerings to differentiate their highly standardized services, which in turn allows them to follow a hybrid strategy—competing on cost-efficient and differentiated services. In fact,

recent studies provide arguments backed-up by empirical evidence that following a hybrid strategy can be even more profitable than pure strategies of low-cost or differentiation (Kim et al. 2004; Pertusa-Ortega et al. 2009; Claver-Cortés et al. 2012). A second reason could be that 3PL providers with advanced service offerings may have countless areas where they can adopt environmental practices, which may shift their attention away from key areas and inhibit them to bundle resources on most beneficial projects. Conversely, it can be argued that 3PL providers with basic service offerings may have more clearly defined areas where to adopt environmental practices. Therefore, they may stronger recognize the value of certain environmental practices and pool resources on few promising projects, which in turn lead to a higher leverage of environmental practices on economic performance.

6.1 Theoretical implications

By analyzing the relationships among perceived stakeholder pressures, environmental practice adoption, and economic performance in the German 3PL industry, this study makes two contemporary and important contributions to the literature and advances our knowledge in various ways. First, the study explored mechanisms of how the complexity of service offerings affects the relationship between perceived stakeholder pressures, environmental practice adoption, and economic performance. By doing so, complexity of service offerings as a novel and important firm-related contingent variable was introduced to the pressure–response–outcome relationship. As complexity of service offerings is closely connected to Porter's (1980) generic competitive strategies, we were able to address the recent call of Grewatsch and Kleindienst (2015) to consider additional contingent variables and better embed the competitive strategy literature into the research on environmental practices.

Second, this study advances our knowledge by providing empirical evidence from a single industry by showing that companies that offer basic logistics services can benefit more from adopting environmental practices than companies with advanced logistics services. Therefore, our research strongly suggests that not only inter-industry (e.g. Darnall et al. 2010), but also intra-industry factors influence the effectiveness of a firm's environmental sustainability strategy.

Finally, this study demonstrates that both perceived stakeholder pressures and environmental practices can be operationalized as higher-order constructs and that different types of stakeholder pressures, as well as environmental practices contribute to the higher-order factors with varying degrees.

6.2 Managerial implications

The results of our study highlight that 3PL providers can compete on environmental sustainability, since the adoption of environmental practices can improve their economic performance. In general, our study indicates that managers initially need to develop the perceptive capabilities to monitor their dynamic stakeholder environment in order to be able to subsequently respond to stakeholder concerns and to adopt environmental practices that are valued in the given institutional

environment. As a next step, 3PL providers need to develop environmental capabilities that allow them to effectively embed different types of environmental practices into their organizational routines.

Moreover, managers must be aware of the fact that the complexity of service offerings influences the degree to which they can profit from implementing certain environmental practices. As the study shows, 3PL providers who offer basic logistics services profit more from implementing environmental practices, as those can support them to differentiate their services while simultaneously lowering their costs. In fact, implementing environmental practices might enable basic 3PL providers to follow a hybrid strategy, which may help them to avoid the price-driven approach underlying the purchase of commoditized logistics services—such as basic transportation and warehousing. Finally, the results of our study highlight the need of 3PL providers to still balance their environmental sustainability efforts with other important factors such as market demand for low-cost logistics services, since environmental practices do not explain the majority of variation in 3PL providers' economic performance (Wolf and Seuring 2010).

6.3 Limitations and future research

Regardless of its contributions, the results of this study need to be interpreted within the context of its limitations. First, our study investigated the relationships of perceived stakeholder pressures, environmental practices, and economic performance within the German 3PL industry. Thus, in order to strengthen the generalizability of our results and to extend sustainability management more fully to the service sector, future research could explore these relationships within other countries and other service industries. Additionally, academics and practitioners could benefit from studies that more closely analyze the direct costs and benefits associated with the adoption of single environmental practices and potential synergistic effects of single environmental practices in practice bundles.

Second, we focused on certain stakeholders, but neglected others that might be important in other industries. Consequently, future research may include additional stakeholders according to their importance in the respective industry. As emphasized by Mitchell et al. (1997), the importance of stakeholders is relative, can change over time, and issue-based—resulting in the recommendation for future research to choose stakeholders more closely based upon power, legitimacy and urgency.

Third, we considered the competitive strategy within the 3PL industry by having introduced complexity of service offerings. We measured this variable by distinguishing between two groups of companies. The first being those whose core business lie in management and execution of standardized logistics services with a focus on transportation and warehousing (3PL providers with basic service offerings). The second group consists of those whose core business lie in customized and bundled services covering inventory management, contract logistics services, coordinative tasks, information-related activities such as tracking and tracing, and value added supply chain activities, such as secondary assembly, inventory financing IT services and installation of products (3PL providers with

advanced service offerings). While this distinction can be seen as a first step to account for a company's competitive strategy in this context, we acknowledge that more specific and fine-gritted schemes are necessary to fully understand its influencing power.

Fourth, as we relied on the perception of single key informants, future research might broaden this perspective by including additional information sources, which might lead to a higher validity of the results (Wagner et al. 2010).

Finally, future research on sustainability issues within the 3PL industry should take further contingencies that might affect the presented linkages into account. On the one hand, such contingencies might lie within a 3PL providers' customer base. 3PL customers from different industries might show a different willingness to pay for environmentally friendly logistics services. The goods that 3PL providers handle for their respective clients might also incur different regulatory requirements concerning their environmentally sound handling. For instance, transporting chemicals compared to transporting consumer goods. On the other hand, the consideration of complementary firm resources, such as innovative and communicative capabilities, could help to more fully understand the role of sustainability in achieving competitive advantage.

References

Ambec S, Lanoie P (2008) Does it pay to be green? A systematic overview. Acad Manag Perspect 22:45–62

Andersson D, Norrman A (2002) Procurement of logistics services—a minutes work or a multi-year project? Eur J Purch Supply Manag 8:3–14

Aragón-Correa JA (1998) Strategic proactivity and firm approach to the natural environment. Acad Manag J 41:556–567

Aragón-Correa JA, Sharma S (2003) A contingent resource-based view of proactive corporate environmental strategy. Acad Manag Rev 28:71–88

Barnett ML (2007) Stakeholder influence capacity and the variability of financial returns to corporate social responsibility. Acad Manag Rev 32:794–816

Barnett ML, Salomon RM (2012) Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. Strateg Manag J 33:1304–1320

Barney J (1991) Firm resources and sustained competitive advantage. J Manag 17:99–120

Bask AH (2001) Relationships among TPL providers and members of supply chains—a strategic perspective. J Bus Ind Mark 16:470–486

Berglund M, Van Laarhoven P, Sharman G, Wandel S (1999) Third-party logistics: is there a future? Int J Logist Manag 10:59–70

Beuthe M, Gasca J, Greene D et al (2007) Transport and its infrastructure. In: Metz B, Davidson O (eds) Climate change 2007—mitigation of climate change. Cambridge University Press, Cambridge, pp 323–385

Bocquet R, Le Bas C, Mothe C, Poussing N (2013) Are firms with different CSR profiles equally innovative? Empirical analysis with survey data. Eur Manag J 31:642–654

Branco MC, Rodrigues LL (2006) Corporate social responsibility and resource-based perspectives. J Bus Ethics 69:111–132

Busse C (2016) Doing well by doing good? The self-interest of buying firms and sustainable supply chain management. J Supply Chain Manag 52:28–47

Buysse K, Verbeke A (2003) Proactive environmental strategies: a stakeholder management perspective. Strateg Manag J 24:453–470

CapGemini (2016) 2016 third-party logistics study: the state of logistics outsourcing. https://www.fr.capgemini-consulting.com/sites/default/files/resource/pdf/3pl_report-final_reduced_size.pdf. Accessed 10 Jan 2017
Carroll AB, Shabana KM (2010) The business case for corporate social responsibility: a review of concepts, research and practice. Int J Manag Rev 12:85–105
Carter CR, Carter JR (1998) Interorganizational determinants of environmental purchasing: initial evidence from the consumer products industries. Decis Sci 29:659–684
Chang S-J, van Witteloostuijn A, Eden L (2010) From the editors: common method variance in international business research. J Int Bus Stud 41:178–184
Cho JJ-K, Ozment J, Sink H (2008) Logistics capability, logistics outsourcing and firm performance in an e-commerce market. Int J Phys Distrib Logist Manag 38:336–359
Christmann P (2000) Effects of "best practices" of environmental management on cost advantage: the role of complementary assets. Acad Manag J 43:663–680
Claver E, Lopez MD, Molina JF, Tarí JJ (2007) Environmental management and firm performance: a case study. J Environ Manag 84:606–619
Claver-Cortés E, Pertusa-Ortega EM, Molina-Azorín JF (2012) Characteristics of organizational structure relating to hybrid competitive strategy: implications for performance. J Bus Res 65:993–1002
Cohen J (1992) A power primer. Psychol Bull 112:155–159
Colicchia C, Marchet G, Melacini M, Perotti S (2013) Building environmental sustainability: empirical evidence from Logistics Service Providers. J Clean Prod 59:197–209
Cordeiro JJ, Sarkis J (1997) Environmental proactivism and firm performance: evidence from security analyst earnings forecasts. Bus Strateg Environ 6:104–114
Craighead CW, Ketchen DJ, Dunn KS, Hult GTM (2011) Addressing common method variance: guidelines for survey research on information technology, operations, and supply chain management. Eng Manag IEEE Trans 58:578–588
Cullinane S, Edwards J (2010) Benefits and costs of switching to alternative fuels. In: McKinnon AC, Cullinane SL, Browne M, Whiteing A (eds) Green logistics: improving the environmental sustainability of logistics. Kogan Page Limited, London, pp 306–321
Dahlmann F, Brammer S, Millington A (2008) Environmental management in the United Kingdom: new survey evidence. Manag Decis 46:264–283
Darnall N, Edwards D (2006) Predicting the cost of environmental management system adoption: the role of capabilities, resources and ownership structure. Strateg Manag J 27:301–320
Darnall N, Henriques I, Sadorsky P (2010) Adopting proactive environmental strategy: the influence of stakeholders and firm size. J Manag Stud 47:1072–1094
de Bakker F, Nijhof A (2002) Responsible chain management: a capability assessment framework. Bus Strateg Environ 11:63–75
de Winter J, Dodou D, Wieringa P (2009) Exploratory factor analysis with small sample sizes. Multivar Behav Res 44:147–181
Delfmann W, Albers S, Gehring M (2002) The impact of electronic commerce on logistics service providers. Int J Phys Distrib Logist Manag 32:203–222
Delmas MA, Pekovic S (2015) Resource efficiency strategies and market conditions. Long Range Plan 48:80–94
Delmas M, Toffel MW (2004) Stakeholders and environmental management practices: an institutional framework. Bus Strateg Environ 13:209–222
Delmas MA, Toffel MW (2008) Organizational responses to environmental demands: opening the black box. Strateg Manag J 29:1027–1055
Delmas M, Hoffmann VH, Kuss M (2011) Under the tip of the iceberg: absorptive capacity, environmental strategy, and competitive advantage. Bus Soc 50:116–154
Dess GG, Robinson RB (1984) Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit. Strateg Manag J 5:265–273
Diamantopoulos A, Winklhofer HM (2001) Index construction with formative indicators: an alternative to scale development. J Mark Res 38:269–277
Dixon-Fowler HR, Slater DJ, Johnson JL et al (2013) Beyond "does it pay to be green?" A meta-analysis of moderators of the CEP–CFP relationship. J Bus Ethics 112:353–366
Donaldson L (2001) The contingency theory of organizations. SAGE Publications, Thousand Oaks
Eberl M (2010) An application of PLS in multi-group analysis: the need for differentiated corporate-level marketing in the mobile communications industry. In: Vinzi V, Chin WW, Henseler J, Wang H (eds)

Handbook of partial least squares: concepts, methods and applications. Springer, Heidelberg, pp 487–514
Endrikat J, Guenther E, Hoppe H (2014) Making sense of conflicting empirical findings: a meta-analytic review of the relationship between corporate environmental and financial performance. Eur Manag J 32:735–751
Fisher RJ (1993) Social desirability bias and the validity of indirect questioning. J Consum Res 20:303–315
Fornell C, Larcker DF (1981) Evaluating structural equation models with unobservable variables and measurement error. J Mark Res 18:39–50
Freeman RE (1984) Strategic management: a stakeholder approach. University Press, Cambridge
Gadenne DL, Kennedy J, McKeiver C (2009) An empirical study of environmental awareness and practices in SMEs. J Bus Ethics 84:45–63
Garcés-Ayerbe C, Rivera-Torres P, Murillo-Luna JL (2012) Stakeholder pressure and environmental proactivity: moderating effect of competitive advantage expectations. Manag Decis 50:189–206
Gilley KM, Worrell DL, Davidson WN, El-Jelly A (2000) Corporate environmental initiatives and anticipated firm performance: the differential effects of process-driven versus product-driven greening initiatives. J Manag 26:1199–1216
Giunipero LC, Pearcy DH (2000) World-class purchasing skills: an empirical investigation. J Supply Chain Manag 36:4–13
Golicic SL, Smith CD (2013) A meta-analysis of environmentally sustainable supply chain management practices and firm performance. J Supply Chain Manag 49:78–95
González-Benito J, González-Benito Ó (2006) The role of stakeholder pressure and managerial values in the implementation of environmental logistics practices. Int J Prod Res 44:1353–1373
González-Benito J, González-Benito Ó (2010) A study of determinant factors of stakeholder environmental pressure perceived by industrial companies. Bus Strateg Environ 19:164–181
Graf NFS, Rothlauf F (2012) Firm-NGO collaborations: a resource-based perspective. J Bus Econ 82:103–125
Graf C, Wirl F (2014) Corporate social responsibility: a strategic and profitable response to entry? J Bus Econ 84:917–927
Green KW Jr, Zelbst PJ, Meacham J, Bhadauria VS (2012) Green supply chain management practices: impact on performance. Supply Chain Manag Int J 17:290–305
Grewatsch S, Kleindienst I (2015) When does it pay to be good? Moderators and mediators in the corporate sustainability-corporate financial performance relationship: a critical review. J Bus Ethics. doi:10.1007/s10551-015-2852-5
Hair JF, Ringle CM, Sarstedt M (2011) PLS-SEM: indeed a silver bullet. J Mark Theory Pract 19:139–151
Hair JF Jr, Hult GTM, Ringle C, Sarstedt M (2016) A primer on partial least squares structural equation modeling (PLS-SEM). SAGE Publications, Thousand Oaks
Hall J, Wagner M (2012) Integrating sustainability into firms' processes: performance effects and the moderating role of business models and innovation. Bus Strateg Environ 21:183–196
Halldorsson A, Kovács G (2010) The sustainable agenda and energy efficiency: logistics solutions and supply chains in times of climate change. Int J Phys Distrib Logist Manag 40:5–13
Halldorsson A, Skjøtt-Larsen T (2004) Developing logistics competencies through third party logistics relationships. Int J Oper Prod Manag 24:192–206
Halldorsson A, Kotzab H, Mikkola JH, Skjøtt-Larsen T (2007) Complementary theories to supply chain management. Supply Chain Manag Int J 12:284–296
Harman HH (1976) Modern factor analysis. University of Chicago Press, Chicago
Hart SL (1995) A natural-resource-based view of the firm. Acad Manag Rev 20:986–1014
Hart SL, Dowell G (2010) A natural-resource-based view of the firm: fifteen years after. J Manag 37:1464–1479
Henriques I, Sadorsky P (1999) The relationship between environmental commitment and managerial perceptions of stakeholder importance. Acad Manag J 42:87–99
Henseler J (2012) PLS-MGA: a non-parametric approach to partial least squares-based multi-group analysis. In: Gaul W, Geyer-Schulz A, Schmidt-Thieme L, Kunze J (eds) Challenges at the interface of data analysis, computer science, and optimization. Springer, Heidelberg, pp 495–501
Henseler J, Sarstedt M (2013) Goodness-of-fit indices for partial least squares path modeling. Comput Stat 28:565–580

Henseler J, Ringle CM, Sinkovics RR (2009) The use of partial least squares path modelling in international marketing. Adv Int Mark 20:277–319
Hertz S, Alfredsson M (2003) Strategic development of third party logistics providers. Ind Mark Manag 32:139–149
Hulland J (1999) Use of partial least squares (PLS) in strategic management research: a review of four recent studies. Strateg Manag J 20:195–204
Husted BW (2000) A contingency theory of corporate social performance. Bus Soc 39:24–48
Javed M, Rashid MA, Hussain G (2016) When does it pay to be good–a contingency perspective on corporate social and financial performance: would it work? J Clean Prod 133:1062–1073
Kassinis G, Vafeas N (2006) Stakeholder pressures and environmental performance. Acad Manag J 49:145–159
Kim E, Nam D, Stimpert JL (2004) The applicability of Porter's generic strategies in the digital age: assumptions, conjectures, and suggestions. J Manag 30:569–589
King AA, Lenox MJ (2001) Does it really pay to be green? An empirical study of firm environmental and financial performance: an empirical study of firm environmental and financial performance. J Ind Ecol 5:105–116
Klassen RD, McLaughlin CP (1996) The impact of environmental management on firm performance. Manage Sci 42:1199–1214
Klassen RD, Whybark DC (1999) The impact of environmental technologies on manufacturing performance. Acad Manag J 42:599–615
Konar S, Cohen MA (2001) Does the market value environmental performance? Rev Econ Stat 83:281–289
Kumar K, Subramanian R (1997) Porter's strategic types: differences in internal processes and their impact on performance. J Appl Bus Res 14:107–124
Lankoski L (2008) Corporate responsibility activities and economic performance: a theory of why and how they are connected. Bus Strateg Environ 17:536–547
Leuschner R, Carter CR, Goldsby TJ, Rogers ZS (2014) Third-party logistics: a meta-analytic review and investigation of its impact on performance. J Supply Chain Manag 50:21–43
Lieb RC (1992) The use of third-party logistics services by large American manufacturers. J Bus Logist 13:29–42
Lieb KJ, Lieb RC (2010) Environmental sustainability in the third-party logistics (3PL) industry. Int J Phys Distrib Logist Manag 40:524–533
Lindell MK, Whitney DJ (2001) Accounting for common method variance in cross-sectional research designs. J Appl Psychol 86:114–121
Litz RA (1996) A resource-based-view of the socially responsible firm: stakeholder interdependence, ethical awareness, and issue responsiveness as strategic assets. J Bus Ethics 15:1355–1363
Maas S, Schuster T, Hartmann E (2014) Pollution prevention and service stewardship strategies in the third-party logistics industry: effects on firm differentiation and the moderating role of environmental communication. Bus Strateg Environ 23:38–55
Malhotra NK, Kim SS, Patil A (2006) Common method variance in IS research: a comparison of alternative approaches and a reanalysis of past research. Manag Sci 52:1865–1883
Marasco A (2008) Third-party logistics: a literature review. Int J Prod Econ 113:127–147
McCarthy-Byrne TM, Mentzer JT (2011) Integrating supply chain infrastructure and process to create joint value. Int J Phys Distrib Logist Manag 41:135–161
McKinnon A (2010) Environmental sustainability: a new priority for logistics managers. In: Cullinane S, Brown M, Whiteing A (eds) Green logistics: improving the environmental sustainability of logistics. Kogan Page Limited, London, pp 3–30
Meixell MJ, Luoma P (2015) Stakeholder pressure in sustainable supply chain management. Int J Phys Distrib Logist Manag 45:69–89
Meznar MB, Nigh D (1995) Buffer or bridge? Environmental and organizational determinants of public affairs activities in American firms. Acad Manag J 38:975–996
Mitchell RK, Agle BR, Wood DJ (1997) Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. Acad Manag Rev 22:853–886
Murillo-Luna JL, Garcés-Ayerbe C, Rivera-Torres P (2008) Why do patterns of environmental response differ? A stakeholders' pressure approach. Strateg Manag J 29:1225–1240
Newbert SL (2007) Empirical research on the resource-based view of the firm: an assessment and suggestions for future research. Strateg Manag J 28:121–146
Nunally JC, Bernstein IH (1994) Psychonometric theory. McGraw-Hill Publishers, New York

Oberhofer P, Dieplinger M (2014) Sustainability in the transport and logistics sector: lacking environmental measures. Bus Strateg Environ 23:236–253
Orlitzky M, Schmidt FL, Rynes SL (2003) Corporate social and financial performance: a meta-analysis. Organ Stud 24:403–441
Paulraj A (2011) Understanding the relationships between internal resources and capabilities, sustainable supply management and organizational sustainability. J Supply Chain Manag 47:19–37
Pertusa-Ortega EM, Molina-Azorín JF, Claver-Cortés E (2009) Competitive strategies and firm performance: a comparative analysis of pure, hybrid and "stuck-in-the-middle" strategies in Spanish firms. Br J Manag 20:508–523
Podsakoff PM, Organ DW (1986) Self-reports in organizational research: problems and prospects. J Manag 12:531–544
Podsakoff PM, MacKenzie SB, Lee J-Y, Podsakoff NP (2003) Common method biases in behavioral research: a critical review of the literature and recommended remedies. J Appl Psychol 88:879–903
Porter ME (1980) Competitive strategy: techniques for analyzing industries and competitors. Free Press, New York
Porter ME, Van der Linde C (1995) Toward a new conception of the environment–competitiveness relationship. J Econ Perspect 9:97–118
Prockl G, Pflaum A, Kotzab H (2012) 3PL factories or lernstatts? Value-creation models for 3PL service providers. Int J Phys Distrib Logist Manag 42:544–561
Rao P, Singh AK, la O'Castillo O et al (2009) A metric for corporate environmental indicators… for small and medium enterprises in the Philippines. Bus Strateg Environ 18:14–31
Reinartz W, Haenlein M, Henseler J (2009) An empirical comparison of the efficacy of covariance-based and variance-based SEM. Int J Res Mark 26:332–344
Reuter C, Foerstl K, Hartmann E, Blome C (2010) Sustainable global supplier management: the role of dynamic capabilities in achieving competitive advantage. J Supply Chain Manag 46:45–63
Ringle CM, Wende S, Becker J-M (2015) SmartPLS 3 Boenningstedt: SmartPLS GmbH. http://www.smartpls.com. Accessed 2 Jan 2017
Rueda-Manzanares A, Aragón-Correa JA, Sharma S (2008) The influence of stakeholders on the environmental strategy of service firms: the moderating effects of complexity, uncertainty and munificence. Br J Manag 19:185–203
Ruhnke K, Gabriel A (2013) Determinants of voluntary assurance on sustainability reports: an empirical analysis. J Bus Econ 83:1063–1091
Russo MV, Fouts PA (1997) A resource-based perspective on corporate environmental performance and profitability. Acad Manag J 40:534–559
Sahay BS, Halldorsson A, Skjøtt-Larsen T (2006) Dynamics of relationship governance in TPL arrangements-a dyadic perspective. Int J Phys Distrib Logist Manag 36:490–506
Sarkis J, Gonzalez-Torre P, Adenso-Diaz B (2010) Stakeholder pressure and the adoption of environmental practices: the mediating effect of training. J Oper Manag 28:163–176
Sarstedt M, Henseler J, Ringle CM (2011) Multigroup analysis in partial least squares (PLS) path modeling: alternative methods and empirical results. Adv Int Mark 22:195–218
Scherer AG, Palazzo G, Seidl D (2013) Managing legitimacy in complex and heterogeneous environments: sustainable development in a globalized world. J Manag Stud 50:259–284
Schoenherr T, Modi SB, Talluri S, Hult GTM (2014) Antecedents and performance outcomes of strategic environmental sourcing: an investigation of resource-based process and contingency effects. J Bus Logist 35:172–190
Selviaridis K, Spring M (2007) Third party logistics: a literature review and research agenda. Int J Logist Manag 18:125–150
Sharma S (2000) Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. Acad Manag J 43:681–697
Sharma S, Henriques I (2005) Stakeholder influences on sustainability practices in the Canadian forest products industry. Strateg Manag J 26:159–180
Sharma S, Aragón-Correa JA, Rueda-Manzanares A (2007) The contingent influence of organizational capabilities on proactive environmental strategy in the service sector: an analysis of North American and European ski resorts. Can J Adm Sci Can des Sci l'Administration 24:268–283
Sink HL, Langley CJ Jr (1997) A managerial framework for the acquisition of third-party logistics services. J Bus Logist 18:163–190
Söllner A (2014) Globalization, greed, and exploitation. How to break the baleful path? J Bus Econ 84:1211–1235

Sprengel DC, Busch T (2011) Stakeholder engagement and environmental strategy—the case of climate change. Bus Strateg Environ 20:351–364
Stanwick PA, Stanwick SD (1998) The relationship between corporate social performance, and organizational size, financial performance, and environmental performance: an empirical examination. J Bus Ethics 17:195–204
Sum C-C, Teo C-B (1999) Strategic posture of logistics service providers in Singapore. Int J Phys Distrib Logist Manag 29:588–605
Surroca J, Tribó JA, Waddock S (2010) Corporate responsibility and financial performance: the role of intangible resources. Strateg Manag J 31:463–490
Tosi HL, Slocum JW (1984) Contingency theory: some suggested directions. J Manag 10:9–26
Touboulic A, Walker H (2015) Theories in sustainable supply chain management: a structured literature review. Int J Phys Distrib Logist Manag 45:16–42
Turban DB, Greening DW (1997) Corporate social performance and organizational attractiveness to prospective employees. Acad Manag J 40:658–672
Van de Ven AH, Ganco M, Hinings CR (2013) Returning to the frontier of contingency theory of organizational and institutional designs. Acad Manag Ann 7:393–440
Van Wassenhove LN, Besiou M (2013) Complex problems with multiple stakeholders: how to bridge the gap between reality and OR/MS? J Bus Econ 83:87–97
Wagner M (2010) The role of corporate sustainability performance for economic performance: a firm-level analysis of moderation effects. Ecol Econ 69:1553–1560
Wagner M (2011) Corporate performance implications of extended stakeholder management: new insights on mediation and moderation effects. Ecol Econ 70:942–950
Wagner M (2015) The link of environmental and economic performance: drivers and limitations of sustainability integration. J Bus Res 68:1306–1317
Wagner SM, Kemmerling R (2010) Handling nonresponse in logistics research. J Bus Logist 31:357–381
Wagner SM, Rau C, Lindemann E (2010) Multiple informant methodology: a critical review and recommendations. Sociol Methods Res 38:582–618
Wang Q, Dou J, Jia S (2015) A meta-analytic review of corporate social responsibility and corporate financial performance the moderating effect of contextual factors. Bus Soc 55:1083–1121
Whiteman G, Walker B, Perego P (2013) Planetary boundaries: ecological foundations for corporate sustainability. J Manag Stud 50:307–336
Wolf C, Seuring S (2010) Environmental impacts as buying criteria for third party logistical services. Int J Phys Distrib Logist Manag 40:84–102
Zhao M, Dröge C, Stank TP (2001) The effects of logistics capabilities on firm performance: customer-focused versus information-focused capabilities. J Bus Logist 22:91–107
Zhu Q, Sarkis J (2004) Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. J Oper Manag 22:265–289