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Internalizing sustainable practices: A configurational approach on sustainable forest management of the Dutch wood trade and timber industry

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Abstract

A number of environmental labels and certificates have been developed to inform consumers of the environmental impacts. This paper explored different configurations of institutional and organizational conditions for the internalization of sustainable practices. For the institutional conditions the level of institutional pressures were considered. For the organizational conditions the following elements were taken into account: 1) the timing of adoption; 2) the willingness to cannibalize existing capabilities and routines to incorporate institutional demands for sustainability; 3) the degree of implementation of these demands; 4) the internal representation of environmental concerns; and 5) the type of organization. The paper analyzed sustainable forestry practices in wood trade and timber factories in the Netherlands using a fuzzy set Qualitative Comparative Analysis. From the analysis, three configurations were found: 1) concerned internalization, for early adopting wood trade companies; 2) forced internalization, for late adopting wood trade companies; and 3) lagged internalization, for late adopting timber factories. The configurations revealed that important conditions for explaining internalization of sustainable practices are high levels of implementation and high levels of willingness. The findings reaffirm the relevance of institutional and organizational conditions in explaining the internalization of environmental friendly practices. They also showed that the interplay between a firm's internal and external environments influence the internalization of environmental practices. The results imply that practice internalization is more subtle than previously understood in the literature.

Keywords: Sustainable forestry practices; Practice internalization; Institutional pressures; fuzzy-set Qualitative Comparative Analysis (QCA); configurational approach

1. Introduction

Firms have started responding to “greening” pressures, due to the increasing impact of business activities on the natural environment (Dunphy et al., 2003; Wiengarten et al., 2013). In this context, a number of voluntary standards, such as environmental labels and certificates, have been developed to inform consumers of the environmental impacts throughout the production, consumption, and waste phases of products and services (Hale, 1996; Nadaı, 1999; Rex & Baumann, 2007). These standards are aimed at encouraging producers, governments, and other agents to increase their environmental standards of products and services (Galarraga Gallastegui, 2002; Hale, 1996). The popularity of these standards has been growing rapidly among firms in the last three decades (Pederson and Neergaard, 2006; Michael et al., 2010). Some examples of the standards include ISO 14001, the German Blue Angel, the Nordic Swan, the EU Eco-Label Award Scheme (OECD, 1997), the UtZ Certified in the case of coffee, and the Forest Stewardship Council (FSC) for timber products (Dendler, 2013; Vermeulen and Kok, 2012).

Some benefits of the standards and the reasons why firms adopt environmental certificates include: certification can result in a new group of consumers (Thompson and Hansen, 2009), and improvements on firms’ environmental performance (Prajogo et al., 2012; Comoglio and Botta, 2012). In this context, institutional pressures have been instrumental in the adoption and implementation of these standards (Comoglio and Botta, 2012; Boiral and Gendron, 2011), for which institutional theory has been used to explain such processes (e.g., DiMaggio and Powell, 1983; Tolbert and Zucker, 1983; Scott, 2001). The adoption of such standards, and their accompanying practices, requires a new environmental logic, which challenges the existing institutional order (i.e. a profit-based logic) of firms. Logics are historically rooted and socially pervasive belief systems or conceptions of the world that provide rules for action (Friedland and Alford, 1991; Thornton and Ocasio, 2008). They structure the attention of decision-makers on a delimited set of issues and solutions, and lead to decisions and activities consistent with those logics (Lounsbury, 2007).

A central argument in institutional theory is that organizations confronted with high uncertainty about a new practice, or doubts about its value, but under strong institutional pressures to adopt the new practice often resort to ceremonial adoption and loose coupling in order to maintain legitimacy (Meyer and Rowan, 1977; Weick, 1976). Adoption can vary in its degree, which is ultimately reflected in the internalization of new environmental practices (as proposed by Kostova, 1999; Kostova and Roth, 2002). Internalization refers to the state in which environmental practices are viewed as valuable and when organizations are fully

committed to the new logic (Kostova and Roth, 2002). However, organizations face a variety of exogenous, sometimes competing, institutional pressures to adopt new practices (Alexander, 1996; Kraatz and Block, 2008). These pressures are differentially received in pluralistic fields with organizations subscribing to multiple institutional logics (Binder, 2007; Greenwood, Magan-Diaz and Lorente, 2010; Lounsbury, 2007). Firms in pluralistic fields face multiple logics that lead institutional pressures to be implemented and internalized differentially (Kennedy and Fiss, 2009; Kostova & Roth, 2002; Westphal and Zajac, 2001).

There has been limited research on the internalization of environmental certificates and the accompanying organizational practices (see Qi et al., 2012, Castka and Prajogo, 2013). The majority of institutional studies have focused on how logics either coexist or compete at the field level, but little attention has been paid to the degree of organization-level conformity to new logics (Durand & Jourdan, 2012). Internalization reflects the extent to which new practices are actually incorporated in an organization's behavior, much more than studies on adoption. Therefore, insight into the internalization of environmental certificates and the accompanying organizational practices at the organizational level is important. The organizational-level explanations for the adoption and internalization of a new logic should include simultaneous attention to the external environment and firms' internal organization to provide more robust explanations (Thornton and Ocasio, 2008; Oberhofer and Fürst, 2012). A configurational approach is particularly attractive for research on internalization because it enables studying the many interconnected elements together (Fiss, 2007). In this study a configurational approach has been adopted to study the interplay between internal and external factors by exploring the links between organizational (internal) and institutional (external) conditions under which organizations internalize environmental practices. The empirical focus will be on sustainable forest management in The Netherlands.

During the 1980s concerns about the rapid deterioration of forests globally, as well as the attendant loss of biodiversity, emerged among scientists, environmentalists and governments (Cashore *et al.*, 2003). Certification schemes for sustainable forest management were proposed in the late 1980s as a means to enable consumers to make informed purchasing decisions. In the early 1990s, a group of non-governmental organizations, governments, forestry companies, traders, and other related companies began negotiating a global system of forest certification. The Forest Stewardship Council was formed in 1993, and established as an operational legal entity in 1996, to administer this system. FSC certification soon became a dominant design for sustainable forest management and certification. Although it enjoyed great legitimacy among international and local environmental stakeholder organizations, it

was long resisted by industry and government actors. For example, in the Netherlands, the timber trading industry, with the occasional support of the Dutch government, resisted FSC by launching a competing certification scheme and attempting to control the perception and supply of certified timber. In addition, other national certification schemes worldwide were supported (Lammers, 2010). The Programme for the Endorsement of Forest Certification (PEFC) was founded in 1999 “as an international umbrella organization providing independent assessment, endorsement and recognition of national forest certification systems” (PEFC, 2013). The Malaysian Timber Certification Scheme (MTCS) is a certificate that has also been used in the Netherlands. The MTCS began operation in October 2001 and has been endorsed by PEFC from May 1st 2009 (MTCC, 2013). PEFC and FSC are the two largest players in the Netherlands as well as worldwide (Lammers, 2010). Please see Table 1 for more information on these two certificates. This paper examines the internalization of sustainable forestry practices in the Dutch wood trade and timber factories.

-----Please insert Table 1 about here-----

Even though it has few forests, the Netherlands is a relatively large importer of tropical timber from South-East Asia (ProFound, 2004), both for domestic use and for European. In addition, the Dutch timber trading firms, the trade and professional associations, environmental non-governmental organizations (ENGOS), and various government agencies have been involved in addressing sustainable forest management. Companies in the timber industry need to combine profit-based and environmental logics in their practices. This raises the following question: which combinations of institutional and organizational conditions lead firms to internalize a new environmental logic in Dutch wood trade and timber industry?

The structure of the paper is as follows: first, the theoretical background is explained; this is followed by the methods and results; the paper ends with a discussion and conclusions.

2. Theoretical background

The institutional logics perspective seeks to explain the relationship between macro- and micro-phenomena in institutional theory (McPherson & Sauder, 2013). Thornton and Ocasio (2008) indicated that institutional logics tend to focus the attention of decision makers on environmental and organization factors that are in line with prevailing logics. If logic changes, organizations will determine to what extent associated practices compatible with relevant

shared values and beliefs of organizations (cf. Ansari, Fiss and Zajac, 2010; Detert, Schroeder and Mauriel, 2000). If changes and associated practices appear to be in conflict with existing beliefs of organizations or broader institutional pressures, they are likely to be less committed to the change leading to less extensive internalization or even to partial decoupling (Ansari et al., 2010). This is in line with Fox-Wolfgramm, Boal and Hunt (1998) who highlighted that organizations differ in the way they respond to new information, adapt to institutional pressures and enact institutional changes, based largely on the distinct beliefs and values that they have developed over time (Alexander, 1996; Love and Cebon, 2008; cf. Meyer, 1982). Similarly, Lounsbury (2007) showed how competing logics shaped variation in the adoption of organizational practices in the mutual funds industry. In the case of environmental practices, timber organizations are likely to find such practices less congruent with a profit-based logic that has long guided their behavior and therefore, engage in less extensive internalization. Timber organizations that have made a conscious choice for becoming more sustainable are expected to engage more extensively in internalization. The internalization of new practices may be the outcome of different configurations of institutional and organizational conditions. The importance of institutional pressures has been highlighted in literature that focused specifically on practice adoption and internalization (e.g. Kostova, 1999; Sanders and Tusckle, 2007; Ijose, 2012). In addition, the role of a variety of organizational factors has been discussed in the context of practice internalization (e.g. Kostova, 1999; Zhu *et al.*, 2007; Lin and Ho, 2011).

2.1 Institutional pressures and the internalization of environmental practices

Organizations often face strong institutional pressures to adopt, adapt, or abandon some of their practices (Scott, 2001). These pressures may originate from a variety of sources, including the state, professional associations, competitors, and the general public (Oliver, 1991; Dacin, 1997). Institutional pressures can take the form of coercive, normative and mimetic forces (DiMaggio and Powell, 1983). The state, or governmental agencies, often impose their influence on organizations through coercive mechanisms of laws and regulations; professional associations are more likely to exert institutional pressure by socialization processes, training and education; and successful competitors might lead other organizations to mimic them (DiMaggio and Powell, 1983). These forces are analytically distinct even if difficult to distinguish empirically (Mizruchi and Fein, 1999). A number of empirical studies have provided evidence of the influence of institutional pressures on different types of organizations such as for-profit (e.g., Davis and Greve, 1997), non-governmental (e.g.,

DiMaggio, 1991) and public organizations (e.g., Tolbert and Zucker, 1983). For instance, Dacin (1997) demonstrated that institutional pressures influenced the choice of the publication language of Finnish newspapers at the time they were founded. Similarly, in their study on radical change in rural U.S. hospitals, D'Aunno, Succi and Alexander (2000) argued that divergent organizational change was partly explained by the influence of institutional forces.

Organizations that are more affected by institutional pressures are more likely to perceive a higher need for adopting new practices. For instance, complying with coercive pressures, applied by governmental agencies through rules and regulations, is necessary for preventing sanctions, and may motivate organizations to adopt new practices (cf. Frumkin and Galaskiewicz, 2004). Normative pressures stemming from professional associations (Dacin, 1997) may motivate the adoption of new practices triggered by a logic of appropriateness (cf. March and Olson, 1989). Mimetic pressures emanating from model organizations that have demonstrated successful adoption may also induce organizations to adopt novel practices (e.g., D'Aunno, Succi and Alexander, 2000; Greve, 1995; Haveman, 1993). However, the forces responsible for practice adoption reach beyond the adoption decision to also affect implementation (Zbaracki, 1998; Zelner, Henisz and Holburn, 2009). For example, in the study of the diffusion of stock exchanges around the world, Weber et al. (2009) showed that mimetic adoptions were more substantively implemented than coercive adoptions. The reasons for adoption, therefore, influence the level of implementation and internalization after the initial adoption of practices (see also Kostova and Roth, 2002). Different reasons for adoption imply different levels of internalization. Organizations that are more vulnerable to impact from institutional pressures tend to be mainly concerned with being seen as compliant with emerging norms and, whilst they may adopt such practices, they tend to engage in less extensive internalization. Coercion may lead to behavior without commitment, and may lead to ceremonial adoption (Kostova and Roth, 2002; Weber, Davis and Lounsbury, 2009) or strategies to preserve autonomy and existing norms (Alexander, 1996), especially when the suggested changes are inconsistent with current practices. A similar effect can be expected for normative pressures, which may not be strong enough to dampen skepticism about the actual internalization of a particular practice (Kostova and Roth, 2002). Mimetic behaviors mainly occur in response to peers or competitors. In such case, the pressure to conform comes from increased market requirements (DiMaggio and Powell, 1983) as well as social and political status (Meyer et al., 1997). When successful peers internalize new practices, even those seen as less consistent with existing practices, organizations tend to mimic their behavior in order

to gain or to maintain a legitimate position. In general, depending on the experienced pressures, adoption of practices by organizations may lead to either more or less extensive internalization.

2.2 *Organizational conditions for internalizing new practices*

Greenwood et al. (2011) indicated that, in addition to institutional pressures at the field level, the extent of internalization of practices related to an environmental logic are also influenced by organizational conditions. In organizations that differ with respect to certain characteristics (conditions) the influence of the institutional pressures will be different. A variety of different organizational conditions have been identified in the literature. Two key organizational conditions have been identified within institutional theory: the underlying values of the organization (in this paper the concern for the environment), and the willingness and ability of firms to change their existing capabilities and routines. Two complementary conditions from practice adoption are: 1) the timing of the adoption and 2) the level of implementation (Kostova & Roth, 2002). The type of organization was included as a specific condition. This final condition takes into account the differences between organizations. The other conditions will be discussed below.

Organizations differ in the way they enact institutional changes, based partly on the distinct ideas, beliefs, and values that they have developed over time (Love and Cebon, 2007). If these changes, and associated practices, are seen to be compatible with relevant shared values and beliefs of organizational participants, then more extensive internalization is more likely (Detert et al., 2000). Therefore, the degree of internalization of new practices is dependent on the underlying values of the organization.

Research has shown that environmental issues have become an integral part of an organization's strategy (Fraj *et al.*, 2011; Sharma and Vredenburg, 1998; De Marchi *et al.*, 2013), where environmental issues and environmental management have gained more attention within organizations, and are more prominent on the agenda of management (Chen, 2008). The extent to which organizations differ in their environmental concern also influences their behavior (Fraj *et al.*, 2011). In this context of environmental management, a number of scholar, such as Cassells and Lewis (2011), found a positive relation between the attitude towards environmental issues and adoption. It can, thus, be argued that firms that have a higher concern for the environment will be more inclined to internalize environmental friendly practices.

Organizational practices tend to become entrenched in the cognitive repertoire of organizational routines and competences (Greenwood, Oliver, Sahlin & Suddaby, 2008). Kostova (1999) noted that it is important for internalization that there is a culture that is supportive of learning, change and innovation. Some firms are more willing, and able, than others at altering their resource base by adding, reconfiguring, and deleting resources or competences in order to adopt new practices (cf. Danneels, 2008). This refers to a firm's willingness to cannibalize, which can be defined as "the extent to which a firm is prepared to reduce the actual or potential value of its investments" (Chandy and Tellis, 1998: p. 475). Similarly, Chandrashekar *et al.* (1999) suggested that the lack of innovation might be related to the unwillingness of an organization to divert from investments in current products. Other studies also showed the importance of willingness to cannibalize in the context of innovation (Nijssen *et al.*, 2005; Herrmann *et al.*, 2007; Tellis *et al.*, 2009). These studies show that it is important for innovation that firms are willing to give up existing investment, and those firms that are less hindered by their history and are more willing to engage in creative destruction will be more inclined to internalize new practices.

The adoption of innovations is usually described as a process (Meyer and Goes, 1988; Klein and Sorra, 1996). One of the models often used, is the 'innovation-decision process' model. This model has the following five steps: knowledge, persuasion, decision, implementation, and confirmation (Drury & Farhoomand, 1992; Rogers, 2005). All innovation adoption models end when the innovation is integrated into the organization. This final stage is also labelled internalization (Kostova and Roth, 2002), which is used in this study as the outcome variable. An earlier stage in this process is the "actual" adoption; the decision to make use of an innovation (Rogers, 2005). Within a field, organizations take this decision at different moments. This results in the typical S-curve for innovation diffusion. Few organizations adopt very early, the majority follows and finally the laggards adopt. Timing has been considered a core element in strategic issue management (Kiesler & Sproull, 1982) and corporate strategy literature (Nehrt, 1996). The literature on first mover advantages has explicitly linked timing to competitive advantage (Lieberman & Montgomery, 1988). Temporal considerations have been considered fundamental aspects that apply to the strategic orientation of firms (Venkatraman, 1989). Studies (c.f. Westphal *et al.*, 1997) have shown that late adopters are for instance more motivated by social gains (legitimacy). A recent study showed that contested practices, those incompatible with existing routines, norms and values, negatively affect the timing of the adoption of new practices (Raaijmakers, Vermeulen,

Meeus & Zietsma, 2015). The timing of the adoption may also be important for the level of internalization of sustainable practices.

After the decision to make use of an innovation, the innovation needs to be put into use, which is done usually during the implementation stage (Damanpour and Schneider, 2006). Kostova and Roth (2002: p.217) explain that “implementation is expressed in the external and objective behaviours and actions required, or implied by the practice”. This stage has been identified as challenging and a “critical gateway” between the adoption decision and the internalization of new practices (Klein and Sorra, 1996). Some organizations may be more active than others and will express more implementation related behavior than others. Kostova (1999) argued that even though it would be expected that implementation is a necessary condition for internalization, “implementation does not automatically result in internalization” (p.311). It might be the case that a practice has been implemented, but the employees still have a negative attitude towards this practice. Nawrocka and Parker (2009) also concluded, in their study on environment management systems that the success of it is dependent on how it is implemented. Based on findings of Li and Hsieh (2009) it can be argued that firms that deploy more implementation activities will also be more inclined to internalize new practices.

Organizational conditions interact with institutional conditions, which means that different configurations of these conditions will lead to different levels of practice internalization. Since the literature does not discuss how different combinations of these conditions influence internalization clear and specific hypotheses are difficult to identify. Nevertheless, these conditions form the starting point of our analysis and formulating propositions on the basis of the insights mentioned above is possible.

Willingness to cannibalize and implementation will always be important conditions or a high internalization. There are no clear indications in the literature that there will be situations in which these conditions are not important.

Furthermore, it can be argued that firms will differ in their motivation, which will influence the level of internalization. It is possible to have a mainly intrinsic motivation (environmental concern), a more of an extrinsic motivation (institutional pressure) or a combination of the two. Based on what is known about different motivations of early and late adopters it is likely that the intrinsic motivation is mainly observed for the early adopters, whereas the extrinsic motivation can be expected for the late adopters. The combination of the two motivations might be observed for the two different types of adopters (early and late adopters).

With respect to the two types of organizations (wood trade and timber factories), there have been no clear indications to expect different configurations upfront.

Therefore, the following three propositions can be formulated:

- 1) Willingness to cannibalize and implementation combined with environmental concern and early adoption will result in high internalization, for both trade as well as timber factories;
- 2) Willingness to cannibalize and implementation combined with institutional pressure and late adoption will result in high internalization, for both trade as well as timber factories; and
- 3) Willingness to cannibalize and implementation combined with institutional pressure and environmental concern will result in high internalization, for both early as well as late adopters and for wood trade as well as timber factories.

The paper's empirical analysis will identify the configurations of conditions that result in high internalization.

3. Methods

This section explains the design of the research, the way the data were collected, how the conditions were operationalized, and finally it explains how the data were analyzed.

3.1 Research design

A configurational approach was used to discern combinations of conditions that enable the internalization of sustainable practices. One of the fundamental aspects of the configurational approach is that it relies on set relationship instead on variables and correlations to describe attributes of cases (Fiss et al., 2013). The shift to set relationship also allows expressing causal relations in terms of necessary and sufficient conditions, an important view of causation that has gained attention in the social sciences (Brady and Collier, 2010). QCA accounts for *equifinality* and *conjunctural causation* (Ragin, 1987; Fiss et al., 2013). Equifinality indicates that different causal paths may lead to the same outcome, whereas conjunctural causation refers to the situation that it is most often a combination of conditions, and not an isolated condition, that eventually produces the outcome.

QCA has increasingly become common in organization and management science. The paper of Fiss (2007), for instance, is a conceptual paper that provides an introduction to the method and its logic. Some recent examples of empirical papers that cover a variety of different areas as well as small- and large-N situations are: Bell et al. (2014), Crilly et al.

(2012), Fiss (2011), and Misangyi & Acharya (2014). Recently, scholars have also applied this approach in the context of sustainability research. Walker *et al.* (2013) offered an application of QCA in the field of corporate environmental performance and Takahashi and Nakamura (2005) in the context of corporate greening.

In this study a relatively new analytical technique, fuzzy-set Qualitative Comparative Analysis (fsQCA), has been utilised. Some of the advantages of the fuzzy-set approach include: 1) it is well suited for the purpose of theory elaboration based on medium-N data sets (Greckhamer *et al.*, 2013); 2) it is particularly appropriate for advancing multi-level theory (Fiss *et al.*, 2013). This study tries to understand and explain the interplay between factors at the firm level and the institutional level that jointly relate to the internalization of environment friendly practices. As such, fsQCA is well suited to deal with issues studied from the perspective of institutional theory (Grandori & Furnari, 2013; Bell *et al.*, 2013). Regression methods could also be used to study the interplay between variables; however, the regression methods are correlational in nature, whereas the configurational approach is based on the identification of configurations of necessary and sufficient conditions. So unlike regression, QCA does not assume that an independent variable is always related to the dependent variable in the same, (non-)linear, and additive way. Additional background and information on (fuzzy-set) Qualitative Comparative Analysis is provided in Appendix I.

3.2 Data collection

Data were collected during two stages. First, a round of 18 semi-structured interviews with different stakeholders was carried out (see Appendix II for an overview). These interviews were used to gain an understanding and in-depth knowledge of the field of sustainable forestry in The Netherlands and also in-depth knowledge on the adoption and internalization processes of these companies. The interviews were transcribed¹ and analyzed to 1) verify the importance of the identified concepts from the literature and 2) to have an understanding how these different concepts influence internalization. In the second stage, an on-line questionnaire was developed, which was then sent out to the sustainability managers of the respective firms. Before sending out the questionnaire a pilot study was conducted with three firms and a scholar with expertise in the theoretical concepts was consulted to critically reflect upon the questionnaire. This helped to refine some of the questions of the questionnaire but also revealed that in general the questionnaire was clear.

¹ For four interviews audio recordings were not available. In those cases the notes and summaries of the interviews were used.

The population consisted of 524 wood trade and timber factories. Firms that did not respond were reminded by e-mail and later by phone. From these reminders, it was found out that the main reasons why firms were not willing to cooperate were a lack of time or a lack of interest. Ultimately, there were 132 organizations that were willing to participate in the study. Due to missing values, complete data for all variables was obtained only for 76 of the 132 firms. However, a comparison of these 76 complete firms against the other 56 incomplete firms showed that there were no statistical significant differences indicating the absence of response biases. This resulted in a final dataset of 76 firms, which all possess one or more sustainable forest management certificates. A large proportion of the respondents adopted FSC (92% of the respondents), as shown in Figure 1. Figure 2 shows when each firm adopted its first certificate.

-----Please insert Figure 1 about here-----

-----Please insert Figure 2 about here-----

3.3 Data analysis

An important feature of the fsQCA analysis is that membership varies in a continuum between 0 and 1. In general, the aim is to calibrate the set membership in such a way that the levels of membership represent meaningful groupings (Ragin, 2008a). A membership score of 0 indicates non-membership, whilst a score of 1 is full-membership. Scores between 0 and 1 represent intermediate levels of membership, for example 0.66 indicates more in than out, whilst 0.33 indicates more out than in. The overall answer on how to assign set-membership values is to base the calibration on the combination of theoretical knowledge and empirical evidence (Ragin, 2000). Ideally, the calibration must make use of criteria that are external to the data (Schneider and Wagemann, 2013); however, in practice, scholars (c.f. Whittington et al., 2013) have often been confronted with theory and substantive knowledge not being available. Hence, no clear indicators were available on where to set the thresholds (such as the 0.5 anchor). For this paper, the authors tested different ways of data calibration, looking for substantive differences in cases, for gaps in the data distribution, and for different boundaries based on percentiles. Since only minor differences were found, for which no theoretical base could be found, the authors opted for straightforward calibration based on percentiles (25, 50, and 75), if no other options were available. The measurement and calibration of the outcome

variable and the conditions are described below. The specific questions can be found in Appendix III.

Outcome variable

The outcome variable was *practice internalization*. For the measurement of practice internalization the scale of Kostava and Roth (2002) was used. The scale has been adapted in such a way that it was appropriate in the context of sustainable forest management. Each item was measured on a 5-point Likert Scale ranging from 1 Totally Disagree to 5 Totally Agree. The score for internalization was calculated by taking the mean of the 7 items (Cronbach's $\alpha = 0.843$). The scale ranged from a minimum of 2.71 to a maximum of 5.00, with a mean of 3.77. This implied that in general low levels of internalization in absolute terms were not observed. In other words, you could argue that this study only explains part of the internalization scale. This can be due to the fact that all organization in this study adopted a sustainable management certificate. A minimum threshold of internalization was expected for these organizations, therefore the lower level of the scale was not observed. It was noted that the organizations varied within the range of the rest of the scale. These scores were used to specify the breakpoints. The 75th percentile was used as the cut-off for scores to be coded as "fully-in," and the 25th percentile for scores to be coded as "fully-out." As a crossover point, the 50th percentile was used.

Conditions

In order to measure *institutional pressure*, the scale that Kostava and Roth (2002) developed for their concept institutional profile was used. These authors defined this institutional profile as "the issue-specific set of regulatory, cognitive, and normative institutions in a given country" (page 217). Their scale consists of 13 items: four related to regulatory pressures, four related to cognitive pressures, and five related to normative pressures. Also this scale was slightly adapted in such a way that the items fit the context of sustainable forest management. Each item was measured on a 5-point Likert Scale ranging from 1 Totally Disagree to 5 Totally Agree. Before constructing the variable institutional pressure, a factor analysis was conducted. The "screeplot" of the factor analysis indicated that the items could be best combined into one component. Even though the Cronbach's Alpha is not very high ($\alpha = 0.582$) it was decided to keep all items in. The alpha only increased slightly when deleting one item ($\alpha = 0.601$). The reliability of the separated scales for the normative, cognitive and

regulatory items was also checked. This analysis showed that these scales, however, were not reliable. Therefore, the score for institutional pressure was calculated by taking the mean of these 13 items. The scale ranged from a minimum of 2.62 to a maximum of 4.08, with a mean of 3.37. These scores were used to specify the breakpoints. The 75th percentile was used as the cut-off for scores to be coded as “fully-in,” and the 25th percentile for scores to be coded as “fully-out.” As a crossover point, the 50th percentile was used. In addition to the literature, the possible importance of this condition was often also mentioned in the interviews that were conducted to get an understanding of the field and to develop the questionnaire. One of the respondents (interview 6) for instance mentioned: “...it came about by very defensive thoughts. I am not sure if you have read that at that time, but back then a lot of NGOs went demonstrating against wood traders and they questioned illegal wood”. Another respondent also explained that he became more worried about the pressures environmental organizations, like Greenpeace for example, had on the industry. He decided to make use of sustainable wood in order to prevent boycotts of his company in the future.

For the measurement of the *timing of adoption* this paper distinguishes between early and late adopters. In order to decide upon the specific cut-off point the distribution of adoption of sustainable forest management among the respondents was used. Figure 2 shows the moment at which firms adopted a certificate. This figure highlights two groups of adopters on the basis of which 2004 was selected as the cut-off point. Firms were labeled early adopters when they adopted sustainable forest management before 2004, and later adopters when they adopted sustainable forest management from 2004 onwards.

For the measurement of *implementation* a 5 item-scale was developed asking about the extent to which the organization deployed implementation activities, such as the development of written procedures and work instructions or integration of standards in their computer systems. Each item was measured on a 5-point Likert Scale ranging from 1 Totally Disagree to 5 Totally Agree. The score for implementation was calculated by taking the mean of these 5 items (Cronbach’s $\alpha = 0.773$). The scale ranged from a minimum of 2.00 to a maximum of 5.00, with a mean of 3.94. These scores were used to specify the breakpoints. The 75th percentile was used as the cut-off for scores to be coded as “fully-in,” and the 25th percentile for scores to be coded as “fully-out.” As a crossover point, the 50th percentile was used. During the interviews it became clear that different organizations do differ in the activities they use as well as in the extent to which they use activities, to get the practice implemented into the system. The relevance of including the level of implementation into the analysis is also illustrated by the following (interview 11): “You need to adjust it very well in your

system...procedures, information sessions, training ...that kind of things. That is an additional burden for the organization”

Willingness to cannibalize was measured similar to Daneels (2008) with an abbreviated version (five items) of the scale developed by Chandy and Tellis (1998). Each item was measured on a 5-point Likert Scale ranging from 1 Totally Disagree to 5 Totally Agree. The reliability of the scale is poor (Cronbach's $\alpha = 0.482$). Removing one variable increased the reliability of the scale a bit, but since this is a tested scale it was decided to leave all items in. The score for willingness to cannibalize was calculated by taking the mean of these 5 items. The scale ranged from a minimum of 2.20 to a maximum of 4.60, with a mean of 3.14. These scores were used to specify the breakpoints. The 75th percentile was used as the cut-off for scores to be coded as “fully-in,” and the 25th percentile for scores to be coded as “fully-out.” As a crossover point, the 50th percentile was used.

The reasons to include this variable in the analysis were twofold. First, the literature study that was performed to construct the theoretical framework showed the potential relevance of this concept in this context of practice internalization (see section 2.2). Second, during the interviews it was mentioned that the fact that some organizations are more willing than others to give up or change a practice is relevant in this context. The following quote illustrates this (interview 12) “*...the company does concrete things with respect to sustainability. To my opinion still not enough, but that is also the opinion of the others, because they want to do more and more. ...we want to change a lot”*

For the measurement of *environmental concern* three statements were developed that asked about the extent to which the organization take part in charity and environmental programs. Each item was measured on a 5-point Likert Scale ranging from 1 Totally Disagree to 5 Totally Agree. The reliability analysis showed that one item should be removed. Based on the content of this item it was also preferable to remove it from the scale. This statement was about the extent to which the organization encourages the employees to take part in environmental activities outside work time, whereas the other items are about the extent to which the organization takes part in these activities. The score for environmental concern was calculated by taking the mean of these 2 items ($\alpha = 0.629$). The scale ranged from a minimum of 1.00 to a maximum of 5.00, with a mean of 3.03. These scores were used to specify the breakpoints. The 75th percentile was used as the cut-off for scores to be coded as “fully-in,” and the 25th percentile for scores to be coded as “fully-out.” As a crossover point, the 50th percentile was used.

In this empirical context of sustainable forest management the relevance of the concept “environmental concern” might seem obvious and it can be argued that it should therefore be taken into account. But there is more at play. For several wood trade and timber factories, the care for the environment was also really part of their business ethics, and they consider it to be a high-priority item on their agendas. During the 1990s, some organizations showed their concerns about the product they are trading, especially their concerns about the durability of the product. They realized that if the timber use would not become more sustainable, there would be no wood left in the future. A respondent (interview 10) also said: *“The most important choice for us as a company was an ethical, moral choice. We just want sustainable wood, period.”*

The final condition in this research is the *type of organization*. Since wood trade and timber factories are two different types of organizations this was included this in the analysis as a dummy. The wood trade companies were coded as 0 and timber factories as 1.

The description above indicated a poor reliability of some of the scales. This applies especially to the condition willingness to cannibalize and to a lesser extent also to institutional pressures and environmental concern. The relevance and importance of these conditions for the research question have already been explained above. In addition to these, there are several reasons to still use these measurements despite the reliability analyses. First, for all the three scales there are theoretical reasons why the items of the scales do belong together. In addition, the scales for willingness to cannibalize and for institutional pressures were based on existing scales that have been used in studies in which they had acceptable levels. Moreover, in this study the number of firms (76) is limited, which influences the usability of this traditional analysis. Related to this, is the range of several of the variables. The descriptive analyses of the different conditions show that for some of them the range is limited. For instance, for institutional pressures the scale ranged from 2.62 to 4.08 (instead of from 1 to 5). This also influences the outcome of the reliability analysis. For the scale of environmental concern it is important to point out that it contains of only two items, which very often results in a relative low alpha. Finally, the usability of Cronbach’s alpha has been discussed in the literature (Sijtsma, 2009). It appears that the Cronbach’s alpha tends to be too low². In the discussion it will also be reflected upon how the results change if one conducts the analysis without the condition.

² Other reliability measures are available as well, such as Guttman Lambda2. Using this procedure the reliability indeed increases to a certain extent for willingness to cannibalize (0.512) and for institutional pressures (0.613).

Testing for necessary and sufficient conditions

After assigning the scores to all firms, the data table was used for deducing a set of necessary and sufficient conditions leading to the outcome. The first test was the test of necessity, to identify the existence of necessary conditions. If the consistency score of a variable exceeds the value of .90, the variable is labeled “necessary” (Ragin 2006).

In every QCA a crucial step in order to identify sufficient conditions is the construction of a truth-table, which is a list of all logically possible configurations³. After deleting all configurations that were not associated with the outcome in the study data, a consistency threshold was specified to only select those configurations that reliably associate with the outcome. Consistency is “the degree to which instances of an outcome agree in displaying the causal condition” (Ragin, 2008a: 44). Following the suggestion of Schneider *et al.* (2010) to select a threshold that corresponds to a break in the distribution, a threshold of 0.810 was applied. In a next step in the analysis, the truth table algorithm (Ragin 2008a) was used to arrive at a more parsimonious understanding. In this algorithm, counterfactuals were used to speculate about the plausible outcomes that do not exist in the data. Two solutions are analyzed: a parsimonious solution and an intermediate solution. The intermediate solution is more conservative because it only takes advantage of the most plausible simplifying assumptions. In addition to core conditions, it contains conditions that are considered peripheral. Based on the identified solutions, the interviews helped to illustrate some of the findings and provide additional explanations.

4. Results

Table 2 provides an overview of the results for the tests of necessity, note that none of these conditions exceeded the 0.90 value (Ragin 2006). This implies that none of the conditions is a necessary condition for the occurrence of high internalization.

-----Please insert Table 2 about here-----

The next step in the analysis revealed three configurations for high levels of internalization. The first two solutions were for wood trade companies. The first solution, labelled “concerned

³ Given the 76 firms and 6 conditions, the recommendation by Marx *et al.* (2013) for the combination of (the number of) conditions and cases (be it for crisp-set QCA analysis), is fulfilled. This assessment of the reliability of our explanatory model is achieved.

internalization”, indicated that wood trade firms that adopted sustainable forest management in an early stage and that have a high willingness to cannibalize in combination with a high level of environmental concern and a high level of implementation may result in high internalization. This combination of conditions is sufficient for high internalization, independent of the institutional pressure.

Firm 50 is an example of an organization that clearly fits this configuration. This wood trade firm is an early adopter. It adopted its FSC certificate in 1998. One year later it also adopted the PEFC certificate and in 2004 the MTSC certificate. At the time of data collection 60% of their wood was labeled sustainable. In general within this firm, sustainable forest management is seen as valuable and they are fully committed to it. This is also reflected in a high score on the internalization scale. On the firm’s website, the FSC certificate is also immediately visible. This firm scores also high on the scale of implementation. During the implementation managers and employees were trained for instance. In this firm they are aware that it is necessary for these kind changes that you need to give up earlier investments, which is reflected by the response on the willingness to cannibalize scale. With respect to the environment in general, they deem this important. This is reflected in the response to the questionnaire and also what they specifically claim on their website “*[firm name] makes an effort to help the environment and takes full responsibility for protecting the environment within its activities*”. They see it as their responsibility to protect the environment. Striking is the observation that they do not seem to be influenced by institutional pressures. They score low on this scale.

The second solution, labeled “forced internalization”, indicated that wood trade companies that adopted sustainable forest management in a late stage, that experience institutional pressure, and have a high willingness to cannibalize in combination with a high level of implementation may result in a high internalization. This combination of conditions was sufficient for high internalization independent of the environmental concern. Firm 61 is illustrative case of an organization that fits the forced internalization configuration. This wood trade firm can be typified as a late adopter, since it adopted its FSC certificate in 2007. At the time of data collection 80% of their wood was labeled sustainable. In general within the firm sustainable forest management is seen as valuable and they are committed to it. This is also reflected in their score on the internalization scale. This firm scores also high on the scale of implementation, as well as on the willingness to cannibalize scale. With respect to the concern for the environment in general, it is not very prominent; neither in their response to questionnaire, nor in what they for instance display on their website. The high score on the

institutional pressures, on the other hand, does show the importance of the institutional environment for this firm.

The third solution, labeled “lagged internalization”, applied to timber factories. This third solution indicates that timber factories that adopt sustainable forest management in a late stage and have a high willingness to cannibalize in combination with a high level of environmental concern and a high level of implementation may result in a high internalization. This combination of conditions was sufficient for high internalization independent of the institutional pressure. Firm 63 is an example of an organization that clearly fits this configuration. This timber factory is a late adopter. It adopted its FSC certificate in 2008. In the same year they also installed a manager responsible for sustainability. At the time of data collection 80% of their wood was labelled sustainable. Within the firm they are committed to sustainable forest management. This is also reflected in a high score on the internalization scale. On the firm’s website, the FSC certificate is also immediately visible. This is also reflected in their score on the internalization scale. This firm scores also high on the scale of implementation, as well as on the willingness to cannibalize scale. With respect to the environment in general, they deem this important, which is reflected in the response to the questionnaire. Similar to firm 53, they do not seem to be influenced by institutional pressures. They score low on this scale.

These results confirm the first two propositions for the wood trade companies, but not for the timber factories. The third proposition was not confirmed. See also Table 3.

-----Please insert Table 3 about here-----

Table 4 provides an overview of the results of the fuzzy set analysis for sufficiency. The table uses the approach of Ragin and Fiss (2008) by displaying the intermediate solutions. The solution consistency “measures degree to which membership in the solution ... is a subset of membership in the outcome” (Ragin 2008b: 86). In other words, solution consistency measures the degree to which cases with the properties of the whole solution, display the outcome (Ragin, 2006). Prior research considers consistency scores of at least 0.80 acceptable (Fiss, 2011). The solution consistency for this research was 0.86 (above the threshold of 0.8). The solution coverage measures the proportion of outcome cases that are covered by all solutions (Rihoux and Ragin, 2009). The solution coverage of this research was 0.39. This implies that there were other conditions that could also explain the outcome.

-----Please insert Table 4 about here-----

The raw coverage for the configurations, the proportion of outcome cases that were covered by each configuration, varied between 0.11 and 0.16. The unique coverage measures the proportion of all outcome cases that are only covered by that configuration (see Ragin, 2006, 2008a; Rihoux and Ragin, 2009). The unique coverage of the solutions varied between 0.11 and 0.16. All solutions had a unique contribution in the explanation of high internalization. The consistencies of solutions were acceptable since they exceeded the threshold of 0.8 (Fiss, 2011). The consistency scores ranged from 0.80 to 0.90.

Comparison of the solutions for high internalization

The solutions were compared to see if there were any patterns. The first two solutions revealed that wood trade companies that have a high willingness to cannibalize and a high level of implementation, either in combination with early adoption and a high level of environmental concern, or in combination with late adoption and institutional pressures result in high internalization. For the wood trade companies the timing of adoption seemed to play an important role. In the case of early adoption, environmental concern was important (in addition to the willingness to cannibalize and implementation). This also became clear during the interviews. One of the early adopters explained that his trade company realized that the use of timber should become more sustainable (interview 2). He claimed that they were concerned about the product they were trading in and especially in the durability of it. The respondent explained that he also had to invest a great amount of time to educate professionals in the field to become more aware of the origin of their wood and the type of wood they use. He really believed in making the sector more sustainable and tried to convince others to adopt the best available schemes. In another interview (Interview 3) a respondent made clear that the company sets goals to continuously improve in a more sustainable manner in order to ensure environmentally appropriate management of the forest.

In the case of late adoption the institutional pressure is important (in addition to the willingness to cannibalize and implementation). One of late adopting trade companies explained in the interview (interview 11): “as a larger player you are more responsible. Company ‘x’ is of course a player that will be put in a negative daylight if something is wrong”. He also explained that buyers are more frequently requesting sustainable wood. So, for this kind of companies the institutional pressure was prominent. In sum, in the case of

early adoption there was more of an intrinsic motivation (environmental concern), whereas in the case of late adoption there was more of an extrinsic motivation (institutional pressure).

The third solution had some similarities with the first solution. In both solutions (one and three) the environmental concern was important (in addition to the willingness to cannibalize and implementation). But the first solution involves wood trade companies that adopted early, whereas the third solution involves late adopting timber factories. One of the respondents working in a timber factory explained the timber factory takes its responsibility (interview 4). He also made clear that further on in the value chain this is not always the case. For another timber factory FSC certification was a way to show that they were committed to sustainable forestry and the use of sustainable timber (Interview 1).

When comparing the three solutions, the importance of implementation and willingness to cannibalize becomes clear, since high levels of both are present in all configurations for high internalization. The importance of the two conditions was also highlighted by the respondents in the interviews. In every interview for instance, the need to pay attention to implementation was explained. Some organizations had the advantage that they were already used to register every action because of a different certification scheme. The additional administrative load was not that high for those organizations. Many also provided training and educated their employees in order to also make them fully aware of and committed to the certificates and sustainable forest management.

With respect to willingness to cannibalize it was striking to see that several respondents (e.g. in interview 4, 9,11 and 15) mentioned that in some cases you need to be willing to give up long lasting relationships with suppliers since these suppliers were not willing to become certified. One respondent said (Interview 11) "one should refuse to commit oneself to one batch or supplier. You should always be able to switch to somewhere else".

It became clear during the interviews (e.g. in Interview 12) that organizations should be willing to learn to work with new types of wood, since the certified supply of the "normal" wood types was not always sufficient. A respondent of a retail company for instance explained (Interview 5): "I do not have the experience with that type of wood. So, that is quite difficult ... then you see the traditionalism". Another retailer (Interview 15) explained the importance of continuous learning: "We follow the developments and trends in every area any way. We are continuously developing to identify what the trends are. It is a continuous learning process". The interviews also showed the importance of willingness to cannibalize for firms that had internalized sustainable forestry practices.

5. Discussion and conclusions

The aim of this research was to understand the variation in the internalization of sustainable forestry management in the Dutch wood trade and timber industry by looking at combinations of institutional and organizational conditions that lead to internalization.

The test for necessary conditions revealed that there were no necessary conditions that explain high levels of internalization. This observation strengthens the understanding that high internalization is explained by complex configurations of conditions. Most explanations of internalization are focused on individual attitudinal components (see Kostova, 1999; Kostova and Roth, 2002). However, the results of the current study suggest that a multilevel explanation is more appropriate for internalization of voluntary standards to occur.

It was observed that a high level of implementation and a high willingness to cannibalize are important conditions for explaining high internalization of sustainable forest management. These two conditions were present in all configurations for high internalization. Since innovation adoption is seen as a process (as indicated by Damanpour and Schneider, 2006) in which implementation precedes internalization it could be argued and expected that implementation is a necessary condition for high internalization. However, in this study implementation was not a dichotomous variable and it dealt with the question to what extent organizations deploy implementation activities. The analyses indicated that a high level of implementation activities was not a necessary condition to achieve high internalization. The importance of the willingness to cannibalize can be explained by the fact that organizational practices tend to become entrenched in the cognitive repertoire of organizational routines and competences (see Greenwood, Oliver, Sahlin & Suddaby, 2008). In order to internalize a new practice, in this case sustainable forest management, the findings shows firms should be willing and be able to alter their resource base by adding, reconfiguring, and deleting resources or competences. Firms need to have a willingness to cannibalize (cf. Danneels, 2008). The findings concur with previous research (e.g. Chandrashekar *et al.*, 1999; Nijssen *et al.*, 2005; Herrmann *et al.*, 2007; Tellis *et al.*, 2009) that highlighted the role of willingness to cannibalize.

The results revealed three configurations of different conditions that are sufficient to explain high levels of internalization:

- 1) *Concerned internalization*: early adopting wood trade firms that have a high level of environmental concern in combination with a high level of implementation and a high willingness to cannibalize results in a high level of internalization;

- 2) *Forced internalization*: late adopting wood trade firms that experience institutional pressure in combination with a high level of implementation and a high willingness to cannibalize results in a high level of internalization; and
- 3) *Lagged internalization*: late adopting timber factories that have a high level of environmental concern in combination with a high level of implementation and a high willingness to cannibalize results in a high level of internalization

The three configurations showed that high levels of implementation and high levels of willingness to cannibalize seem to be important conditions for explaining internalization of sustainable practices. In combination with either pressures from the institutional environment or from the internal organization (in terms of environmental concern) it results in high levels of internalization. These findings complement previous research that showed the importance of institutional pressures (c.f. Kostova and Roth, 2002) and the firm's environmental concern (c.f. Cassells and Lewis, 2011). The configurations identified in this research, however, indicate that the effects of these two conditions should not be researched in isolation, but depend upon the type of organization and the timing of adoption.

The configuration based on the environmental concern applies to wood trade firms that adopt sustainable forest management in an early stage and to timber factories that adopt sustainable forest management in a late stage. For wood trade firms that adopted sustainable forest management in a late stage it is the configuration based on the institutional pressure that applies. This latter configuration is in line with scholars (c.f. Westphal et al., 1997) who claimed that late adopters are more motivated by social gains (legitimacy).

This argument, however, does not apply in the case of late adopting timber factories, for which the configuration based on environmental concerns also applies. This result might be explained by the type of organization. The timber factories in this study were, in general, smaller compared to the trade organizations firms (means of 64 full-time equivalents compared to 106 full-time equivalents). And even though consumers are next in the value chain, the timber factories are not very visible and known to the general public. The interviews revealed that the end-consumers are not very aware of the different certificates and are, therefore, less demanding. The buyers in the business-to-business relations, however, are aware of the certificates and increasingly require the supplier to be certified. As a consequence the influence of the institutional environment on firm's behavior may be smaller. This can explain why internalization for timber factories seem to be driven more by their own values, in this case environmental concern, and not by institutional pressures.

This relevance of the underlying values of the organization (Love and Cebon, 2007) also comes back in the configuration of concerned internalization. This configuration is in line with research that showed that early adopters make the decision independent of peer pressure (e.g. Rogers, 2005). These early adopters base their decisions much more on their own perceptions of what is important, reflected in the environmental concern of the wood trade firms in this case.

It can be argued that some (theoretical) possible configurations are missing. For instance, there is no configuration that includes the combination of early adopting firms and institutional pressures. Based on arguments within institutional theory, this configuration would be also less likely, since you would expect earlier adopters are more triggered by technical gains whereas late adopters are more motivated by social gains (legitimacy) (e.g. Tolbert and Zucker 1983; Westphal et al., 1997). Thus, in the case of early adopters the role of the institutional pressures is likely to be less relevant.

The results reveal no configuration in which timber factories adopt early. This is likely to be the result of the data in which it is not systematically observed. The timber factories in this study's data set in general are relatively late adopters. The downside is that, based on the results, it can only be concluded that for timber factories that adopt in later stages the environmental concern is important. It was not possible to conclude if this was also of importance for early adopting timber factories.

In section 3 of the paper the reliability of the scales has been discussed. Especially, the Cronbach's alpha of willingness to cannibalize was low. It is difficult to predict if the results would be similar or even stronger if the reliability would have been higher or that the results would drastically change. It is however possible to see how the results change if willingness to cannibalize is excluded. Therefore, another fsQCA was conducted, but this time without willingness to cannibalize. The results from both analyses are convergent. Two important patterns, the concerned and forced internalization (solution 1 and 2 but without willingness to cannibalize) are also observed with this analysis. This implies that the original results are robust. The original analyses also revealed that willingness to cannibalize is an important condition for explaining internalization. Since the possible importance was also identified in the literature and in the interviews and given the observation that the rest of the results remain similar (with or without willingness to cannibalize) it was decided to still report the model including willingness to cannibalize.

Theoretical implications

The majority of the studies on certification schemes have mainly focused on the adoption and diffusion of the certification processes and provided insights, for instance, in the benefits and reasons for firms to adopt these certificates (c.f. Michael *et al.*, 2010; Prajogo *et al.*, 2012; Comoglio and Botta, 2012). Insight into the internalization of environmental certificates and the accompanying organizational practices was missing (see Qi *et al.*, 2012, Castka and Prajogo, 2013). Moreover, the majority of institutional studies showed how logics either coexist or compete at the field level, but insight into the degree of organization-level conformity to new logics was also absent (Durand & Jourdan, 2012). Therefore, in this study the focus was on the internalization of sustainable forest management at the organizational level.

While a number of scholars have highlighted that organizational-level explanations for the adoption and internalization of a new logic should include simultaneous attention to the external environment and firms' internal organization (see Thornton and Ocasio, 2008; Oberhofer and Fürst, 2012), most have explored these conditions in isolation.

This study combines institutional conditions external to the organization and internal organizational conditions in order to explain the variation in sustainable practice internalization at the organization level. The results revealed that it is indeed the interplay between the internal and external environment of firms that influence internalization of environmental practices. The application of the configurational approach made it possible to really obtain insight into these combinations. The results imply that practice internalization is more subtle than previously understood.

This research showed that high levels of implementation and high levels of willingness to cannibalize are important conditions for explaining internalization of sustainable practices. In combination with either pressures from the institutional environment or from the internal organization it results in high levels of internalization. Which of these applies is dependent upon the type of organization within the industry and the timing of adoption.

Practical implications

In this study institutional as well as organizational conditions have been researched in the context of internalization of environmental practices. Based on the findings of the study several practical implications follow. Although it is possible to influence an organizational environment as a firm, it is relatively difficult to strongly influence the level of institutional pressure on the short term. Therefore, the practical implications for managers mainly reside in

the organizational conditions. The adoption of a voluntary standard and its accompanying practices imposes a new environmental logic. The existing institutional order (i.e. a profit-based logic) of the firm is challenged. The adoption on its own is not sufficient for high internalization. Although you need to have be aware of the new standard and an should have an understanding of it before you adopt it, it does not mean you are also see the practice as valuable and your are fully committed to it (internalization). The study indicates that if a firm aims for a high internalization of a voluntary standard it is important that it deploys implementation activities to do so. In addition the study highlights that that a firm should also be willing and able to alter its resource base since existing organizational practices tend to become embedded in organizational routines and competences. The study also shows that firms should at least be aware of when they adopt the voluntary standard since the timing of adoption will make a difference as well. Finally, it helps when environmental issues have become an integral part of an organization's strategy. For policymakers the findings of the study indicate that the institutional conditions (in combination with several organizational conditions) matter. If policymakers would like to stimulate internalization of these environmental practices, the findings suggest that policymakers could look at ways of creating an environment that facilitate the internalization. Furthermore, they could look at ways to also influence the organizational conditions that foster the internalization.

Limitations and implications for future research

The following limitations should be noted. The paper distinguished between institutional and organizational conditions. In the selection of the conditions the authors searched in the literature for conditions that would be most logical from a theoretical point of view. The interviews confirmed the relevant conditions. Still, this study might have missed some important conditions. Since organizational size and age are often two control variables in a more traditional approach, such as a regression analysis, the authors undertook two additional analyses: one including organizational size and one including organizational age. The results have remained the same. Additionally, a preliminary regression indicated that size and age had no effect on the level of internalization. The above supports the conclusion that the authors selected the most important conditions.

The limitations of some of the scales have been extensively been discussed earlier in this paper. For future research it is, however, suggested to carefully look at the scale for willingness to cannibalize. It might be better to use the more elaborate version of the scale or to develop a new scale.

The paper focuses on the internalization behavior of wood trade and timber factories in the Netherlands. It would be interesting to also study some other players of the production chain in future research. It would also be interesting to replicate this study in other countries.

A relative new method (the Fuzzy set QCA) was applied in the context of sustainable development. The use of QCA allowed the authors to study how factors combine into configurations of institutional and organizational conditions. The use of this method in institutional theory can be a promising avenue for future research.

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Appendix I: Key concepts of qualitative comparative analysis (QCA):

1. Systematic comparative case research

A systematic comparison of cases allows researchers to reduce complexity and discern patterns in a limited number of cases. QCA allows them to move away from full complexity (a description of each case with its own idiosyncrasies) to a more parsimonious explanation.

2. Multiple conjunctural causation (Ragin, 1987, 2000; Rihoux 2003)

This implies that: 1) often, it is a combination of *conditions* that produces a phenomenon, the *outcome*; 2) several different combinations of conditions may produce the same outcome (equifinality); and 3) depending on the context, the ‘conjuncture’, a given condition may well have a different impact on the outcome, *i.e.* in some configurations the presence of a condition might generate an outcome, in others the absence of the same condition might also generate an outcome.

3. Data analysis in QCA

Essentially, QCA is set-theoretic in nature. It conceptualizes the connection between conditions and outcomes in terms of set membership (Fiss, 2007). Each case is assessed for its membership in each of the sets studied. Hence, determining set membership (*i.e.* calibration) is the key decision to capture the diversity of the cases. In crisp-set QCA (csQCA), set membership is evaluated in a dichotomous (‘crisp’) way: cases are either in (1) or out (0). In fuzzy set QCA (fsQCA) the degree of membership can be taken into account and the scores can range from 0 to 1. In addition to full membership (1) and full non-membership (0) a case may have partial membership (a score between 0 and 1). A fuzzy set “can be seen as a continuous variable that has been purposely calibrated to indicate degree of membership in a well-defined and specified set” (Ragin, 2008a;p.26). One needs at least three set membership scores in fsQCA: fully in (1), fully out (0) and the crossover point, but more than three scores can be used as well. One needs both substantive and theoretical knowledge to calibrate measures and translate them into set membership scores.

4. Truth table

To reduce complexity, cases are pooled in identical ‘configurations’. Technically this is done with truth tables which list all theoretically possible combinations (2^k where K = number of conditions) of configurations. In the case of five conditions and outcome, a truth table consists of 32 rows (*i.e.* 2^5). Each case is placed in one row. A row can contain several cases or none.

5. Boolean Minimization

Besides reducing complexity through truth tables, QCA allows researchers to reduce complexity and achieve maximum parsimony by minimizing configurations. “If two Boolean expressions differ in only one causal condition yet produce the same outcome, then the causal condition that distinguishes the two expressions can be considered irrelevant and can be removed to create a simpler, combined expression” (Ragin, 1987:93). The difference between reducing complexity and achieving full parsimony is not only one of degree, but is fundamentally linked to the research goals. Hence, QCA reduces complexity by lowering the number of configurations and the number of causal conditions in a configuration by eliminating irrelevant causes.

6. Necessary and sufficient conditions.

The analysis allows researchers to identify non-trivial, necessary and sufficient (configurations of) conditions. Suppose in a csQCA two *sufficient* combinations of conditions were detected ($A \cdot B \cdot C \rightarrow Z$; and $A \cdot B \cdot D \rightarrow Z$). Each configuration in itself is sufficient to produce the outcome (Z). However, these configurations are not necessary, as each time another configuration exists that leads to the same outcome. Within these two configurations, conditions A and B are necessary attributes, present in both configurations. They are *necessary* conditions for the outcome to occur. However, they are not sufficient conditions, because in themselves they do not produce the outcome, they need to be combined with other conditions (C and D respectively).

7. Consistency

Consistency “assesses the degree to which cases sharing a given condition or combination of conditions [...] agree in displaying the outcome in question” (Ragin, 2006, p. 292). Technically, consistency is computed by dividing the number of cases by a certain value (1 or 0) on a particular condition and outcome, by the total number of cases with that outcome value (Rihoux & De Meur, 2009:47). The presence of contradictory configurations (the same configuration resulting in both the presence and absence of the outcome) lowers consistency scores. The aim is to obtain high consistency scores, indicating that a high proportion of cases with a given cause or combination of causes display the same outcome. In large-N studies, consistency should exceed .80 (Ragin, 2008a), whereas in small-N csQCA it should be close to 1. For more details, see Goertz (2006).

8. Coverage

An assessment of the way the respective terms of the minimal formulae ‘cover’ observed cases. It can be considered a measure of the ‘fit’ of the model. Three measures exist (Rihoux & De Meur, 2009:64): (a) raw coverage, which is the proportion of cases covered by a configuration; (b) unique coverage, which is the proportion of cases uniquely covered by a configuration, so that no other configurations cover them; (c) solution coverage, which is the proportion of cases covered by all the configurations.

Appendix II: Overview of interviews

Interview	Date	Company
1	April 6, 2010	Timber factory I
2	April 12, 2010	Wood trade company I
3	April 19, 2010	Wood trade company II
4	May 3, 2010	Timber factory II
5	May 20, 2010	Retailer I
6	May 31, 2010	Retailer II
7	June 2, 2010	Construction company I
8	June 9, 2010	Retailer III
9	June 18, 2010	Industry Association Dutch Wood Trade organizations
10	June 29, 2010	Wood trade company III
11	July 5, 2010	Wood trade company IV
12	July 9, 2010	Construction company II division 1
13	July 9, 2010	Construction company II division 2
14	July 13, 2010	Dutch organization of one of the certification schemes
15	July 15, 2010	Retailer IV
16	July 20, 2010	Real estate developer
17	July 25, 2010	Real estate company
18	July 28, 2010	Auditing company

Appendix III: Questionnaire items

Below the different scales with the items are provided for which a 5-point Likert scale was used. These items are translated from Dutch.

Internalization (Based on Kostova and Roth, 2002)
My organization is willing to put in a great deal of effort beyond that is normally expected in order to help implement sustainable forest management
My organization publicly expresses that sustainable forest management is a great way to do business
My organization’s values and the values promoted by sustainable forest management are very similar
My organization is extremely glad that it is involved in sustainable forest

management
My organization really cares about sustainable forest management and the future of our forests
My organization often finds it difficult to agree with sustainable forest management principles (<i>reverse</i>)
Sustainable forest management inspires all of our employees to do their best.

Implementation
Our company has developed written procedures and work instructions covering the implementation of all sustainable forest management standards applicable to us
Our company has identified specific persons and positions responsible for implementing each sustainable forest management procedure or work instruction
Our company has integrated every element of the sustainable forest management standards in our computerized and other administrative systems
Our company has adapted its sustainable forest management implementation procedures to its various business departments, business units or plants/warehouses
Our company keeps records of the training provided to staff in relation to the implementation of the sustainable forest management standards

Willingness to Cannibalize (Based on Chandy and Tellis, 1998)
We easily replace one set of abilities with a different set of abilities to adopt a new technology.
We tend to oppose new technologies that cause our manufacturing facilities to become obsolete. (<i>reverse</i>)
We are very willing to sacrifice sales of existing products in order to improve sales of our new products.
We will not aggressively pursue a new technology that causes existing investments to lose value. (<i>reverse</i>)
We support projects even if they could potentially take away sales from existing products.

Environmental concern
My organization engages more in charities than our competitors.
My organization participates more in external environmental programs or campaigns than our competitors.
My organization encourages employees to engage in environmental activities outside their work duties (<i>has been removed in final scale</i>)

Institutional pressures (Based on Kostova and Roth, 2002)
The Dutch government stimulates the use of sustainable wood
In The Netherlands, laws and rules in business concerning sustainable wood are strictly enforced
There are laws in The Netherlands to protect consumers from illegal wood
There is a large number of regulatory bodies in The Netherlands which promote and stimulate sustainable wood
Most of the successful companies in The Netherlands are implementing certificates

for sustainable forest management
People in The Netherlands know a great deal about the origin of wood in products
There is a lot of talk about sustainable wood going on in the Dutch media
There is a very strong message by companies in The Netherlands, that you can't stay in business nowadays without the use of sustainable wood
Sustainable forest management is at the heart of who we are as a people
In our environment, it is a moral obligation to deliver products with a sustainable forest management certificate
It is expected in The Netherlands that companies would only deliver products with a sustainable forest management certificate
People in The Netherlands care a great deal that companies exploit the forest in a responsible manner
Companies would deliver sustainable wood even if not required by customers

	Start	Area certified forest in million ha	Number of chain of custody certificates (CoC) worldwide³	Number of chain of custody certificates (CoC) in The Netherlands³
FSC	1996	152 million ha in 80 countries ¹	21.881	1.221
PEFC	1999	243 million ha in 27 countries ²	8.589	380

Table 1 Numbers on FSC and PEFC certificates (sources 1: (FSC, 2013); 2: (PEFC, 2013); 3: (PEFC, 2011)) FSC = Forest Stewardship Council; PEFC = The Programme for the Endorsement of Forest Certification

Condition	High internalization	
	Consistency	Coverage
Institutional pressure	0.55	0.54
~Institutional pressure	0.54	0.50
Timing of adoption	0.72	0.46
~Timing of adoption	0.28	0.56
Implementation	0.67	0.67
~Implementation	0.44	0.40
Willingness to cannibalize	0.75	0.64
~Willingness to cannibalize	0.36	0.40
Environmental concern	0.67	0.64
~Environmental concern	0.45	0.45
Type of organization	0.57	0.45
~ Type of organization	0.43	0.54

Table 2 Analysis of necessary conditions for high internalization (~ denotes the logical operator “not” (see Fiss 2007))

Proposition	Empirical observation
1 Willingness to cannibalize and implementation combined with environmental concern and early adoption will result in high internalization, for both trade as well as timber factories.	Confirmed for wood trade companies
2 Willingness to cannibalize and implementation combined with environmental concern and early adoption will result in high internalization, for both trade as well as timber factories.	Confirmed for wood trade companies
3 Willingness to cannibalize and implementation combined with institutional pressure and environmental concern will result in high internalization, for both early as well as late adopters and for wood trade as well as timber factories.	Not confirmed

Table 3 The propositions and the empirical observations

Configurations for achieving high internalization			
	Solution 1	Solution 2	Solution 3
Institutional pressures		●	
Timing adoption (1 = late adoption)	⊗	●	●
Implementation	●	●	●
Willingness to cannibalize	●	●	●
Environmental concern	●		●
Org Type (1 = timbre factory)	⊗	⊗	●
Consistency	0.90	0.80	0.87
Raw Coverage	0.12	0.11	0.16
Unique coverage	0.12	0.11	0.16
Solution consistency	0.86		
Solution coverage	0.39		

Table 4 Configurations for high level of internalization (Full circles (●) indicate the presence of a condition; Crossed-out circles (⊗) indicate the absence of a condition; large circles indicate conditions that are part of the parsimonious and intermediate solutions (core conditions); small circles indicate conditions that are only part of the intermediate solutions (peripheral conditions)).

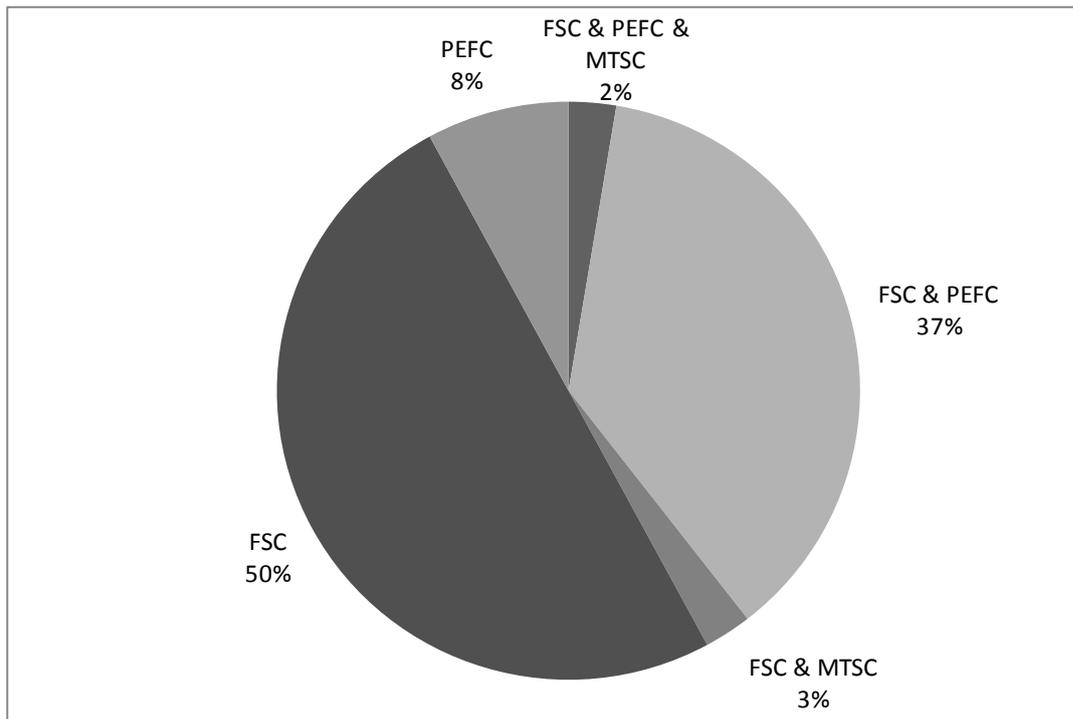


Figure 1 The adoption of different types of sustainable forestry management certificates in the Dutch wood trade and timber industry (n=76).
 FSC = Forest Stewardship Council; PEFC = The Programme for the Endorsement of Forest Certification; MTCS = The Malaysian Timber Certification Scheme

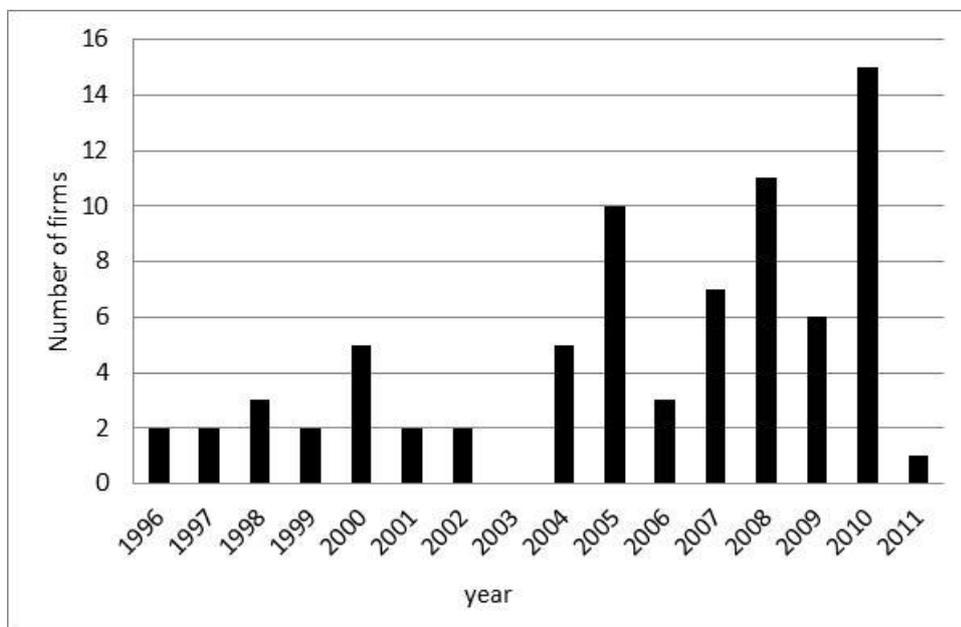


Figure 2 Adoption time of sustainable forestry management certificates in the Dutch wood trade and timber industry