Can They See Us? Ecological Community Logics, Identifiable Business Ownership, and Green Innovation as a Company Response

Yannick Bammens[1] Paul Hünermund[2]

April 2021

Abstract: We investigate which companies are more inclined to respond with green innovations to ecological community pressures. We propose that the noneconomic utility – in the form of personal reputation gains for business owners – of doing so is greater when owner identifiability is higher, and that owner identifiability therefore intensifies the effect of ecological community pressures on firm-level green innovation. Our hypotheses are tested on a sample of over 2,800 German firms using instrumental variable regression analyses, and we find support for our main ideas. Our study advances the institutional sustainability literature by explaining how community conditions and corporate ownership shape firm-level innovation as a response to green pressures.
Keywords: Institutional logics, ecological sustainability, innovation, business ownership.

INTRODUCTION

Due to heightened environmental concern in the general public and among corporate stakeholders, ecological sustainability figures prominently on the agenda of most companies (Delmas & Toffel, 2004; Flammer, 2013; Bammens & Hünermund, 2020). In the European Union (EU), for instance, more than nine in ten citizens consider climate change to be a serious problem and about four in ten believe that responsibility for tackling climate change lies with business and industry (European Commission, 2017). Firms operate in complex institutional settings and experience normative pressures from multiple sources (Greenwood et al., 2011; Yan et al., 2021). In relation to ecological sustainability, the local *community* in which the firm is located constitutes an under-researched but critical stakeholder since many of the environmental practices of firms have first and foremost an impact on its surrounding community (e.g., air, water, soil pollution) and community actors can exert directed pressures at particular firms (Bush et al., 2001; Berrone et al.,

[1] Maastricht University, School of Business and Economics, Department of Organisation, Strategy, and Entrepreneurship, Tongersestraat 53, 6211 LM Maastricht, NL. Email: y.bammens@maastrichtuniversity.nl

[2] Copenhagen Business School, Department of Strategy and Innovation, Kilevej 14A, 3rd floor, 2000 Frederiksberg, DK. Email: phu.si@cbs.dk

2010). Little is known about how community pressures motivate firms to introduce innovative green processes and products, and what makes some firms more susceptible to these pressures.

To shed light on this, we will use an institutional lens to analyze how ecological community logics, proxied with the political preferences of its residents, cause firms operating under different ownership configurations to introduce novel green processes and products. Institutional theory represents one of the dominant theoretic lenses adopted in management research on sustainability (Bansal & Song, 2017). Its core argument is that companies may choose to meet institutional expectations to enhance the firm's social legitimacy (Bansal & Clelland, 2004; Berrone et al., 2013). Institutional scholars posit that firm legitimacy has instrumental value for business owners because it improves their firm's long-run success and survival prospects. Indeed, without sufficient legitimacy, the firm is expected to lose support from resource providers and clients and to attract the scrutiny from regulators and the media (Meyer & Rowan, 1977; Scott, 1987). Traditionally, firm legitimacy is thus viewed as a critical first-order noneconomic outcome of responding to green institutional pressures, and this noneconomic gain is deemed valuable because it increases firm success and survival prospects as a second-order economic gain.

Institutional scholars thus far paid little attention to how the utility derived from firm legitimacy can differ depending on the ownership configuration of the business (Greenwood et al. 2011). Recently, Durand and colleagues (2019) revealed that the perceived benefits of responding to normative pressures depend on the goals and priorities of those in control of the firm. Accordingly, in this study, we introduce the novel notion of *identifiable business ownership* and assert that, when identifiability is high, enhanced firm legitimacy will not only result in better firm success and survival prospects (i.e., second-order economic gain) but also in *personal reputation* gains for

business owners (i.e., second-order noneconomic gain). This, we argue, creates a meaningful additional incentive for substantive firm responses to green normative pressures.

Clearly, businesses can adopt different types of proenvironmental responses to deal with green normative pressures, ranging from largely symbolic to more substantive reactions (Meyer & Rowan, 1977; Durand et al., 2019). We will concentrate on the introduction of *green innovations* (also referred to as eco-innovations) as a firm-level substantive response. Examples of green innovations include process and product innovations that lead to reduced CO_2 pollution, reduced water or soil pollution, reduced energy or material use, or improved recycling after use (Bammens & Hünermund, 2020). The idea that firms can respond to institutional pressures by introducing innovations is relatively new. Earlier institutional writings highlighted the role of mimicry and isomorphism (DiMaggio & Powell, 1983; Selznick, 1996), even suggesting that "organizations which innovate (…) bear considerable costs in legitimacy" (Meyer & Rowan, 1977: 353). More recently, Berrone and colleagues (2013) introduced the idea that green innovations are a particularly powerful tool for firms to deal with mounting green institutional pressures and secure firm legitimacy in the ongoing "age of sustainability". Compared to ceremonial or standardized environmental practices, green innovations are more substantive in nature, better tailored to the specifics of the firm and, therefore, tend to attract less skepticism from stakeholders and to reflect more positively on the firm (Berrone et al., 2013; Bammens & Hünermund, 2020).

We propose that exploring green innovation as a substantive response to green pressures is particularly relevant in the context of our study because of two main reasons. First, we look at the prevalence of an ecological *community* logic as a normative institutional pressure (cf. Lee & Lounsbury, 2015; Tilleman et al., 2020). At the community level, local stakeholders can more easily observe the real effects (e.g., pollution reduction) of a firm's proenvironmental initiatives

and may thus be exceptionally perceptive and appreciative of green innovations which move beyond ceremonial or standardized practices (Bammens & Hünermund, 2020). Second, we are interested in how owners' *identifiability* and *personal reputation* motive shape organizational responses to institutional pressures. As indicated by Deephouse and Carter (2005), a favorable reputation is based on relative standing, for which differentiation through innovation is likely to be beneficial.

To test our model, we use a sample of 2,825 German companies. Gauging institutional logics and probing causation is a key challenge in institutional research (Durand & Thornton, 2018). Toward this end, we analyze the political preferences of community residents and use a green party voting variable to evaluate the prevalence of an ecological community logic; this green party voting variable is then instrumented to mitigate endogeneity concerns. For the other variables of our model, we use data from the German Community Innovation Survey and the rating agency Creditreform.

Our study makes two main contributions to the institutional literature on sustainability. First, it extends the traditional institutional theoretic argument by conceptualizing how enhanced firm legitimacy, as a noneconomic first-order outcome of responding to normative pressures, may not only increase business owners' economic utility through improved firm survival prospects (Meyer & Rowan, 1977), but also their noneconomic utility through personal reputation gains. We posit that identifiable business ownership acts as a key trigger of this noneconomic utility mechanism, thereby intensifying the effect of ecological community logics on firm-level green innovation. This analysis sheds valuable light on the mechanisms linking macro-level green institutional forces to heterogeneous firm-level activities. It also advances the emerging line of research dealing with how ownership configurations shape firm responses to institutional pressures (Greenwood et al.,

2011). It thus reveals how governance variables, like ownership in our case, serve to bridge the relationship between external institutional pressures and corporate strategic pursuits.

Second, few empirical studies have looked at innovation as a response to institutional pressures (e.g., Berrone et al., 2013) or researched organizational responses to green logics at the community level (e.g., Lee & Lounsbury, 2015). We contribute to both streams by analyzing green innovation as an effective response to green community pressures, where local actors often directly witness the consequences (or lack thereof) of proenvironmental practices. With our unique measure of green community logics and instrumental variable regression approach, we offer scarce causal evidence on this topic. Overall, our study contributes to broader developments in the institutional literature by revealing how normative pressures emanating from ecological community logics can promote organizational innovation and heterogeneity, rather than organizational mimicry and homogeneity (Scott, 2008; Berrone et al., 2013).

THEORY AND HYPOTHESES

Management researchers studying corporate sustainability often draw on institutional theory (Etzion, 2007; Aguinis & Glavas, 2012; Bansal & Song, 2017). Institutional theory comes in a variety of forms (for reviews, see Scott, 1987, 2008; Greenwood et al., 2011), but the central idea in most applications in the sustainability field is as follows: business organizations, in varying degrees, experience institutional pressures (e.g., social expectations, standards) urging them to adopt proenvironmental practices, and they may choose to succumb to those pressures mainly to protect their social legitimacy and build goodwill among stakeholders which, in turn, improves their long-term success and survival prospects (Scott, 1987; Aguinis & Glavas, 2012; Berrone et al., 2013). Businesses with a weak legitimacy, the institutional argument goes, would have trouble

attracting vital resources and retaining clients and key personnel, and would be subject to harsh public and regulatory scrutiny (DiMaggio & Powell, 1983; Bansal & Clelland, 2004). Improved firm legitimacy represents a first-order noneconomic outcome of responding to green institutional pressures, which has instrumental value mainly because it increases organizational performance prospects as a second-order economic outcome (Meyer & Rowan, 1977).

Over the years, there have been several developments in institutional theory (Scott, 2008; Durand & Thornton, 2018; Alvesson & Spicer, 2019), of which two are particularly interesting in the context of our study. First, earlier institutional writings emphasized how institutional pressures from the external environment lead to isomorphism among organizations, "seek[ing] to explain homogeneity, not variation" (DiMaggio & Powell, 1983: 148). Lately, institutional scholars have reoriented their focus to explaining heterogeneity among firms based on, for instance, differences in community and firm attributes. These scholars highlight that companies operating in similar countries or sectors can face divergent institutional forces because of variance in community-level logics (Marquis et al., 2007; Lee & Lounsbury, 2015), and that firms can choose to respond differently to institutional pressures due to divergence in the beliefs and priorities of those in power, including the business owners (Greenwood et al., 2011; Durand et al., 2019).

Second, earlier institutional writings stressed how the search for legitimacy by firms tends to encourage mimicry and risk-avoidance (Selznick, 1996; Bansal & Clelland, 2004). As said, Berrone and colleagues (2013) recently revealed that institutional forces can also inspire innovative behavior by firms.[3] In their words, "[c]ompared with other environmental practices, which might be effective in the short term in signaling the right direction but which are subject to being decoupled from actual implementation (…), environmental innovation is a proactive

[3] In a related literature stream, scholars studied how institutional norms and the environmental movement promote ecological entrepreneurial activity in the form of new venture creation (e.g., Sine & Lee, 2009; Meek et al., 2010).

initiative that has a longer horizon, requires greater commitment, has superior chances of having a bigger impact (…) and is thus more likely to reap the social benefits of acquiescence" (Berrone et al., 2013: 894). Institutional pressures, therefore, do not necessarily incite risk-avoiding imitation but may foster innovation, which better fits a firm's specific situation and enables it to offer a substantive response to societal demands for change (Scott, 2003; Berrone et al., 2013). In sum, there has been a shift in institutional research from explaining homogeneity and imitation to analyzing heterogeneity and innovation among firms.

Ecological Community Logics and Green Innovation

Institutional logics are persuasive patterns of assumptions, values and beliefs that prescribe what constitutes appropriate behavior and how to interpret social reality (Thornton & Ocasio, 1999; Thornton, 2004). Institutional logics provide guiding principles for firms on how to act in order to safeguard their legitimacy and the support from the public and firm stakeholders (Greenwood et al., 2011). Institutional logics exert normative pressures on companies, with noncompliance undermining their legitimacy and long-run survival capabilities (Scott, 1987, 2003). Firms operate in complex institutional fields and are subject to multiple institutional logics (e.g., market, state, community, profession) which can be partly incompatible, such that managers have leeway in prioritizing different logics (Greenwood et al., 2010; Durand & Thornton, 2018; Yan et al., 2021). One form of institutional logic which garnered some scholarly attention in recent years, in particular in relation to ecological sustainability, is situated at the region or community level (Lee & Lounsbury, 2015; Dowell & Muthulingam, 2017; Tilleman et al., 2020).

The value of studying community logics in relation to ecological sustainability derives from the fact that many of the environmental practices of firms have, first and foremost, an impact on the

surrounding local community, with community actors operating as vigilant monitors who can exert directed pressures by organizing neighborhood protests, attracting local media attention, and the like (Bush et al., 2001; Berrone et al., 2010; Bammens & Hünermund, 2020). An ecological community logic can be defined as a normative belief system at the community level that attaches high intrinsic value to the preservation of the natural environment and to human pollution reduction (Lee & Lounsbury, 2015; York et al., 2016).

Based on an array of demographic, geographic and socioeconomic factors, local communities show significant variance in their proenvironmental orientation (Delmas & Toffel, 2004; Coan & Holman, 2008). Whereas some communities are, for instance, primarily concerned with economic development to combat growing unemployment and criminality, others reveal a much stronger proenvironmental focus with green citizen groups or other local community initiatives (Lee & Lounsbury, 2015). As highlighted by Durand and Thornton (2018), evaluating the prevalence of institutional logics is a major challenge in institutional research. Given that community residents' preferences for political parties have been said to reveal community-level sentiments and priorities (Greenwood et al., 2010; Lee & Lounsbury, 2015), we tackle this challenge by analyzing the voting results of the proenvironmental political party *Die Grünen* (The Greens) at the German federal elections across communities (electoral districts) relative to the German national average.

As an institutional normative pressure, an ecological community logic signals to resident firms what appropriate environmental behavior involves according to local community members' social expectations (Scott, 2003; Greenwood et al., 2011). When confronted with community pressures, the potential loss of legitimacy, and threat of social sanctions in the form of targeted community protests, can incentivize firms to take proenvironmental initiatives. As noted by Berrone and colleagues (2010: 89), "community pressures are beamed at specific plants, making these pressures

more salient and concrete than at the national level, where environmental demands are aimed at a more abstract entity, the corporate umbrella".

When responding to ecological community pressures, businesses can choose between different types of responses with varying effects (Bansal & Roth, 2000; Durand et al., 2019). So have institutional scholars often referred to ceremonial or symbolic responses by firms, in which formal policies and procedures are largely decoupled from actual business operations (Meyer & Rowan, 1977; Scott, 2008). Firms may also opt for standardized programs or off-the-shelf technologies (Sharma, 2000), which are not necessarily ceremonial but may have limited effectiveness as they were not developed to fit the specific needs and conditions of the focal firm (Jennings & Zandbergen, 1995; Jiang & Bansal, 2003). We think that community members will be particularly skeptical and discerning when it comes to ceremonial and standardized responses, since they live in the vicinity of the firm and experience first-hand whether proenvironmental activities have any meaningful effect (Berrone et al., 2010).

Another possible organizational response to ecological community pressures involves the introduction of green innovations, which refer to new or significantly improved processes and products (i.e., goods or services) that reduce the ecological impact caused by production or consumption (Sharma, 2000; Carrillo-Hermosilla et al., 2010). Green innovations are substantive rather than ceremonial in nature, meaning that they represent "significant changes that involve material costs and are not easily reversible" (Durand et al., 2019: 300). Green innovations also tend to have a bigger ecological impact compared to standardized practices since they are tailored to the specific situation of the firm, and they allow firms to differentiate themselves by meeting or even exceeding expectations from stakeholders (Berrone et al., 2013; Durand et al., 2019). Perhaps even more so than for pressures emanating from higher institutional levels like the state level (cf.

Berrone et al., 2013), green innovations are particularly useful in dealing with ecological pressures coming from local community actors who live near the firm and are quite discerning with respect to the effectiveness of environmental firm initiatives, such as the resultant reduction in pollution levels. Therefore, as a baseline hypothesis, we propose that:

> *Hypothesis 1. The prevalence of a strong ecological community logic, as exemplified by above national average green party voting behavior by community residents, will encourage a higher level of green innovation by firms registered in that community.*

Organizational Filter: Identifiable Ownership and Noneconomic Gains

As mentioned, earlier institutional writings stress how institutional pressures lead to isomorphism or homogeneity among organizations (Meyer & Rowan, 1977; DiMaggio & Powell, 1983). More recent work, particularly in the neo-institutional stream (e.g., Greenwood & Hinings, 1996), puts emphasis on strategic agency and heterogeneity by recognizing that firms may choose to respond differently to pressures depending on the interpretations and priorities of powerful internal firm actors (Delmas & Toffel, 2008; Durand et al., 2019). Stated differently, firm-level responses to institutional logics "are likely to be reflexive of the interests of the most influential group" (Greenwood et al., 2011: 344). An important category of influential actors concerns the owners of the business since ultimate control over firm affairs resides in their hands (Kumar & Zattoni, 2015). In management research in general, business owners as high-level corporate actors have received much less attention compared to directors and managers, partly due to data availability as well as the frequently adopted agency assumption of diffuse ownership structures made up of powerless and anonymous investors (Dalton et al., 2007). Yet, as recognized by Greenwood and colleagues (2011), in relation to organizational responses to institutional pressures, ownership can function as an important organizational filter.

Business owners influence management via various mechanisms, including the election of board members (often taking a seat on the board themselves), the casting of votes during the annual meeting, the filing of shareholder proposals and, perhaps most importantly, private behind-the-scenes negotiations. Grounded in research on owner preferences (e.g., Thomsen & Pedersen, 2000; Connelly et al., 2010; Gomez-Mejia et al., 2011), nascent research has started to explore how owner attributes may affect a firm's susceptibility to institutional forces (Greenwood et al., 2011). In this study, we introduce the notion of owner identifiability in the institutional sustainability literature, and examine its potential moderation effect in the association between the prevalence of an ecological community logic and firm-level green innovation.

In view of our focus on normative pressures emanating from the local community, we define identifiable ownership as those forms of ownership where external community members can more easily recognize and establish the identity of a firm's main owners; identifiable ownership can be contrasted with anonymous or faceless ownership as commonly portrayed in agency-based studies (Dalton et al., 2007; Jansson, 2013). The notion of identifiability is rooted in the broader reputation literature, which underscores the importance of the public's ability to establish an informational link between an event and an actor for the event to have reputational implications for that actor (Fombrun & Shanley, 1990; Rhee & Valdez, 2009). Accordingly, earlier management studies on reputational dynamics have referred to a collection of related concepts, such as public visibility, recognition, exposure, prominence and eponymy (Rhee & Valdez, 2009; Deephouse & Jaskiewicz, 2013; Harrison et al., 2018; Minichilli et al., 2021). Owner identifiability thus enables community members to use ecological firm activities as an informational input for social evaluations of the main owners, thereby creating a strong reputational connection between the firm and its owners.

Institutional studies have traditionally focused on the role of firm legitimacy and its importance for long-run firm success and survival, which represents an economic motive (Meyer & Rowan, 1977; Scott, 1987). Yet, long-run organizational success and survival are not the only concern of business owners. Owners also have noneconomic interests, one of them being how the legitimacy and reputation of the firm reflect on their *personal reputation* (Berrone et al., 2010; Bammens & Hünermund, 2020). When a firm has a weak legitimacy in its community – i.e., when its practices are judged to be inappropriate according to community norms and expectations – blame may be assigned to the firm's owners and this "naming and shaming" severely damages the business owners' personal reputation (Jansson, 2013). Conversely, owners of companies that enjoy a strong legitimacy and reputation "may bask in the reflected glory of the firm" (Deephouse & Jaskiewicz, 2013: 342). The personal reputation gains, which business owners may obtain by pushing for green innovation as a response to ecological community pressures, increase the noneconomic utility they derive from their ownership stake. Even more so than for legitimacy (Berrone et al., 2013), innovation tends to strengthen one's reputation, which is based on social comparison and relative standing (Deephouse & Carter, 2005).[4] We claim that this noneconomic personal reputation mechanism holds mainly for those companies with identifiable ownership due to greater public recognition of the connection between the firm and its owners; when owners are anonymous, there will be a disconnect between the firm's green behavior and its owners' reputation (Berrone et al., 2010; Deephouse & Jaskiewicz, 2013).

[4] Here, we deviate from traditional institutional theory by complementing firm legitimacy with firm reputation as an outcome of responding to normative pressures. As pointed out by Deephouse and Carter (2005), there is substantial conceptual overlap between legitimacy and reputation, but they view "legitimacy as the *social acceptance* resulting from adherence to regulative, normative or cognitive norms and expectations" and "reputation as a *social comparison* among organizations on a variety of attributes, which could include these same regulative, normative or cognitive dimensions" (p. 332, emphasis added). Therefore, while green innovation is expected to enhance firm legitimacy (Berrone et al., 2013), it may have an even stronger effect on firm reputation which hinges on differentiation (Deephouse & Carter, 2005).

Using formal expected utility language (Kahneman & Tversky, 1979), the standard institutional theoretic argument can be formulated as follows: Responding to ecological community pressures by introducing green innovations generates a first-order noneconomic gain in firm legitimacy and reputation (x_1) with probability p_1. In turn, improved firm legitimacy and reputation (x_1) leads to a second-order economic gain in firm success and survival prospects (x_2) with probability p_2. Here, improved firm legitimacy and reputation (x_1) does not have intrinsic value for business owners, but only instrumental value because it increases firm success and survival prospects (x_2) (Meyer & Rowan, 1977). As such, the expected utility that business owners derive from introducing green innovations in response to ecological community pressures equals $p_2 \cdot v(x_2)$ where the function v transforms the stated economic gains in utility (Kahneman & Tversky, 1979). Our novel owner identifiability argument implies the following: Improved firm legitimacy and reputation (x_1) also leads to a second-order noneconomic gain in personal reputation (x_3) with probability $p_3 = f(\text{owner identifiability})$ where f(.) is an increasing function of owner identifiability with $p_3 = 0$ if owner identifiability = 0 (i.e., anonymous ownership). We assume that business owners attach intrinsic value to gains in their personal reputation, such that the associated expected utility equals $p_3 \cdot u(x_3)$ where the function u transforms noneconomic gains in utility (Kahneman & Tversky, 1979). Therefore, the overall expected utility that business owners derive from introducing green innovations as a substantive response to ecological community pressures equals $p_2 \cdot v(x_2) + p_3 \cdot u(x_3)$. Given that this overall expected utility is an increasing function of owner identifiability [$p_3 = f(\text{owner identifiability})$], we predict that owner identifiability intensifies the effect of ecological community pressures on firm-level green innovation.

In this study, we evaluate our newly introduced theoretic construct, identifiable business ownership, along distinct yet interrelated dimensions that collectively contribute to higher levels

of identifiability. Specifically, we assess identifiable ownership along four dimensions for which we can obtain reliable secondary data to offer a first test of our theory, namely (a) concentrated ownership, (b) family ownership, (c) branded ownership, and (d) local ownership (see Tadelis, 1999; Berrone et al., 2010; Jansson, 2013; Bammens & Hünermund, 2020; Minichilli et al., 2021). As such, identifiable ownership is conceptualized as a formative construct, with each of the above four dimensions (which should not be read as an exhaustive list) increasing overall identifiably of the business owners, and reducing the likelihood that they are perceived as anonymous or faceless by local community members.

First, ownership concentration reflects to what extent the shares of a firm are widely-held by numerous atomistic shareholders versus closely-held by one or a few large blockholders (Dalton et al., 2007; Setia-Atmaja, 2009). A diffuse ownership base makes it much more difficult for outside community members to establish the identity of a firm's shareholders and to give them credit for meeting community norms and expectations in relation to ecological performance. When a firm's equity base is concentrated in the hands of just one or a few large blockholders, external community members will be better able to establish their identity and to hold them accountable for the company's operations and offerings (Jansson, 2013), with associated implications for the business owners' personal reputation.

Second, next to structural elements like ownership concentration, the identity of the parties owning company shares will also play a role in relation to owner identifiability (Gomez-Mejia et al., 2011). In the EU, including Germany as our empirical setting, family ownership represents the most widespread owner identity type (European Commission, 2009; Bammens & Hünermund, 2020). Relative to other owner identity types, families tend to have a longer history of association with their firm, often spanning multiple generations, and several members of the owning-family

typically assume an active role in the family business (Gomez-Mejia et al., 2011). Consequently, people often know the family behind a family-owned firm. As such, owner identifiability will be relatively high, with a strong connection between the firm's legitimacy and reputation and the personal reputation of members of the owning-family. This should render family-owned firms more susceptible to community pressures for green innovation to improve the family image (Berrone et al., 2010; Bammens & Hünermund, 2020).

Third, branded ownership (or eponymy) reflects whether the company name contains the last name of one or more of its owners; i.e., whether the last name of its owners is used for company branding purposes. The company name is a critical intangible asset for most firms, creating name recognition in the market and community – and the public closely associates it with the firm's image (Horsky & Swyngedouw, 1987; Tadelis, 1999). It is not uncommon for firms to incorporate the last name of founding or other influential owners in their name, and such branded ownership increases the public visibility of owners and the ease with which they can be identified by outside community members (Cennamo et al., 2012; Minichilli et al., 2021). When the firm carries their name, its conduct and legitimacy will reflect strongly on the business owners' personal reputation. So, if the company name contains the last name of one or more of its owners, these owners will be incentivized to take the ecological concerns of the surrounding community more seriously, and to respond in a substantive manner with green innovations due to stronger reputational spillovers.

The final dimension of identifiable ownership that we consider is local ownership. It captures business owners' social embeddedness in the firm's surrounding community as residents of, and social participants in, that community (Niehm et al., 2008; Bammens & Hünermund, 2020). When local ownership is higher – meaning that more of the firm's owners have their personal home address in the vicinity of the firm's site location – community members can more easily recognize

and establish the identity of these owners, who they may meet during social interactions at school, in the store, at church, and so on (Berrone et al., 2010). In this situation, improved firm legitimacy and reputation, due to substantive organizational responses to ecological community pressures, will reflect more strongly on the personal reputation that owners experience in their relevant social sphere (i.e., the community in which they live). Conversely, when business owners reside in areas far away from the firm's site location, members of the local community will probably have a harder time putting a face on these owners and giving them credit for exemplar firm behavior (Berrone et al., 2010; Bammens & Hünermund, 2020). This results in our second hypothesis:

> *Hypothesis 2. Identifiable ownership in the form of (a) concentrated ownership, (b) family ownership, (c) branded ownership, and (d) local ownership strengthens the effect of a strong ecological community logic on resident firms' level of green innovation.*

METHODS

Data and Sample

To test our hypotheses, we combine firm-level data stemming from the German edition of the Community Innovation Survey (CIS) with detailed data on business owners provided by Creditreform, Germany's largest credit rating agency. The CIS is a pan-European innovation survey, which forms the basis for the official science, innovation, and technology statistics reported by Eurostat. It follows the guidelines for surveys on innovation and R&D spelled out in the Oslo manual (OECD, 2005). The data covers the entire manufacturing sector and those industries from the primary (e.g., mining, utilities, excluding agriculture) and service sector (e.g., wholesale trade, transportation, printing and publishing, telecommunications, engineering and R&D services) in which a majority of innovation activities are expected to take place (Peters & Rammer, 2013). Due to this wide coverage, the data closely matches the general structure of the German economy. For example, 95 percent of firms in our sample have less than 250 employees

and only 0.25 percent are listed on a stock exchange. We make use of the 2015 edition of the German CIS, which covers the years 2012 to 2014.

As an input for their credit risk models, Creditreform maintains a comprehensive database of ca. 3.3 million German firms, which includes, among others, variables on business ownership. We merge this information with the CIS based on a common identifier in both data sets. Furthermore, we retain additional firm-level data from Creditreform, such as the credit rating and legal form. With the help of address information, we then link these firms to the 299 German electoral districts.[5] This allows us to collect election results as well as demographic and economic indicators at the district-level, which are provided by the office of the German Federal Returning Officer (www.bundeswahlleiter.de). Our final sample contains 2,825 firms, for which complete records are available in the CIS and at least one natural person can be identified as owner.

Measures of Variables

In the following, we describe the dependent variable of our study, the main independent variables of interest, as well as our control variables.

Green innovations. The 2015 CIS questionnaire includes an extensive survey item related to innovation initiatives with ecological benefits. Firms are asked whether they introduced any innovations (new or significantly improved processes/products) with the following environmental benefits in the period between 2012 and 2014:

- Process innovations that:
    1. reduced the energy consumption per unit of output or operation
    2. reduced the material or water consumption per unit of output or operation
    3. reduced CO_2 emissions per unit of output or operation

[5] In our sample, we observe firms as separate legal entities, as they appear in the trade register. Firms can thus be a subsidiary as part of a larger group, and we control for this in our empirical analyses. We are not able to observe whether firms have several plants at different locations. Due to the large share of SMEs in our sample, however, the share of multi-plant firms is expected to be low and the potential for measurement error should thus be small.

4. reduced other air emissions (e.g., SO_X, NO_X)
5. reduced water or soil pollution
6. reduced noise pollution
7. replaced fossil with renewable energy sources
8. replaced dangerous materials and substances
9. promoted recycling of waste, water or materials for own use or sale

- Product innovations that:
  10. reduced the energy consumption
  11. reduced the air, water, soil or noise emissions
  12. improved the recyclability of products after use
  13. extended the lifetime of products

We compute our dependent variable as the sum of individual categories in which a firm has introduced an innovation. Since these categories have a weight of either zero or one (i.e., an innovation with this particular environmental benefit was introduced or not), this measure ranges from zero to maximally thirteen and reflects the breadth of firms' green innovation initiatives.[6]

Green party voting. To measure the prevalence of an ecological community logic, we collect election results of Germany's proenvironmental political party *"Die Grünen"* ("The Greens") for all 299 electoral districts in the 2009 federal elections.[7] The Greens were founded in January 1980 as a by-product of the environmentalist and peace movements of the time. Since its foundation, the party has adopted a distinct ecological platform and emphasized topics such as pollution, sustainable resource use and the phase-out of nuclear power. They entered the German *Bundestag*

[6] For our purposes, this survey-based measure is superior compared to using patent data because only 6.9 percent of firms in our sample filed a patent application between 2012 and 2014. We classified these patents based on WIPO's Green Inventory list (https://www.wipo.int/classifications/ipc/en/green_inventory/), which uses IPC classes to determine inventions of environmentally sound technologies. The resulting measure of *Green Patent Applications* has a small but significant correlation (= 0.07) with our survey-based dependent variable. This exemplifies the fact that many innovations with environmental benefits are not patented, in particular among SMEs.

[7] Local elections (e.g., at the state or municipality level) are not suitable in the context of our study because they follow different election cycles and are thus not organized at the same point in time. Moreover, data access for local elections is not consistently organized across all regions. Federal elections are held every four years in Germany. The 2009 election was thus the most recent one before our survey period. The German electoral system grants two votes to citizens, one for the direct candidate within an electoral district, and a second vote that determines the share of seats in the parliament. We focus on this second vote, because it is cast directly for a political party, rather than an individual delegate, and is generally considered to be the more important of the two votes. Electoral districts are the smallest unit for which election results are available. Districts are determined based on population density and thus vary in size. A map of all electoral districts is available at https://de.wikipedia.org/wiki/Liste_der_Bundestagswahlkreise_2009.

(Germany's federal parliament) for the first time in 1983 and won further votes in the 1987 elections due to a heightened environmental awareness following the Chernobyl disaster and widespread fears of forest dieback caused by acid rain pollution ("*Waldsterben"*). In 1998, the Greens entered a coalition as a junior partner with the Social Democratic Party (SPD) and formed the government that eventually elected Gerhard Schröder as its chancellor. This government lasted almost two full terms, until a failed motion of confidence against Schröder triggered an early election in 2005. In the 2009 elections, which we use as a basis for our study, the Greens obtained 10.7 percent of the national votes. At the time, this was their best result in a federal election so far. Nevertheless, they had to join the parliamentary opposition against a new center-right government led by Angela Merkel. We operationalize green party voting as a binary variable indicating whether votes for the Greens in an electoral district exceed the national average. Since the election result at the national level is decisive for the composition of the federal parliament, and is thus communicated widely in the media, it serves a reference point for citizens to judge whether their local community exhibits heightened proenvironmental logics. Indeed, preferences for political parties reflect the sentiments and priorities of local communities (Greenwood et al., 2010; Lee & Lounsbury, 2015), and relative district-level green party voting results are thus a useful indicator for the prevalence of an ecological community logic.

Family ownership. The family ownership variable is a self-reported binary measure, which indicates whether the majority of shares of a firm is held by members of a single family. Self-reporting is advantageous for our purposes because identifying family members based on last names is prone to error (e.g., due to changes in surnames after marriage). The respective item in the CIS questionnaire refers to family ownership for the survey period as a whole and thus assumes ownership structures to be time-invariant in the short-run.

Concentrated ownership. From Creditreform, we collect data on individuals (natural persons) that held an ownership stake in the respective company during the survey period. The average owner in our data is invested since 2004, which confirms the assumption that ownership of firms in our sample is quite stable. In order to assess the degree of ownership concentration, we construct a variable based on the shares that individuals own.[8] By definition, this information is only available for incorporated companies. For unincorporated businesses, in which owners are unlimitly liable with their personal wealth, we divide ownership equally between partners recorded in our data. Inspired by the Herfindahl-Hirschmann index used in antitrust economics (Cabral, 2017), we then take the sum of squares of individual shares and divide it by ten thousand: $\Sigma_{i=1}^{n} s_i^2 / 10000$. The resulting concentration measure ranges from zero to one, with one indicating that a firm is owned by a single individual, and zero if owners are atomistic.

Branded ownership. To measure branded ownership, we compare the surnames of owners with the names of the firms in which they are invested, and construct a firm-level dummy equal to one if at least one of its owners' surnames also appears in the company name.

Local ownership. Creditreform's database contains information on the home addresses of owners. We are thus able to measure the distance between their domicile and the company's registered address. To this end, we developed a script that automatically obtains geo coordinates of addresses by repeatedly querying the Google Maps API using the R package "ggmap" (Kahle & Wickham, 2013). Subsequently, we compute the shortest distance – as the crow flies – between firm and home locations according to the haversine method. In order to reduce the influence of outliers, we winsorize individual distances at 150 kilometers. Finally, we construct a variable that is equal to one if the average distance across all owners is smaller than ten kilometers. This

[8] On average, our data covers 93 percent of the total shares of a firm in our sample, which is due the fact that we restrict attention to natural persons instead of legal entities holding ownership stakes.

operationalization captures the idea of a threshold level for the effect of the local embeddedness of business owners in their firm's immediate neighborhood (in the robustness checks section, we explore the sensitivity of our results to this particular cutoff choice).

Identifiable ownership. The above four variables (concentrated, family, branded, and local ownership) represent distinct yet interrelated dimensions of ownership identifiability. In order to combine them into a single composite index, we conduct a principal component analysis (PCA), which is in line with formative measurement theory (Edwards, 2011; Kline; 2011). Since we deal with both continuous and categorical data, however, we have to rely on dimension reduction techniques suitable for mixed data types (Chavent et al., 2011, 2014). The PCAmix algorithm, implemented in the "PCAmixdata" R package, allows us to conduct a PCA based on a Generalized Singular Value Decomposition (GSVD) of pre-processed numerical and categorical data (for further details on the method, see Chavent et al., 2014). We retain one principal component with an eigenvalue larger than one (= 1.75). The contributions of our four individual indicators are thereby relatively homogenous: *Family Ownership* contributes 26 percent, *Concentrated Ownership* contributes 19.1 percent, *Branded Ownership* contributes 24.3 percent, and *Local Ownership* contributes 30.6 percent to the first principal component. A high score for the resulting composite index indicates that firm owners exhibit a combination of several distinct dimensions of ownership identifiability, which fits well with our conceptual framework.

Control variables. Throughout our analyses, we control for firm size (measured as the number of employees in 2013), exporter status (in 2013), and firm age (in 2014). We also adjust for whether a firm belongs to an enterprise group and whether it is located in Eastern Germany, where private company ownership was impossible for more than 40 years due to communist rule (both items are

measured for the survey period as a whole). Furthermore, we include a set of 21 industry dummies according to the NACE classification (Rev. 2.0) in our regressions.

Since we are interested in the noneconomic motive (i.e., personal reputation gains) in reacting to institutional pressures, we need to account for the economic incentive to cater to community preferences in order to increase a firm's survival chances. We do so by controlling for credit ratings (as obtained by Creditreform for the year 2013), which holds constant firms' default risk. These ratings come in the form of a standardized index ranging from 100 (best rating) to 600 (worst), in line with the German school grade system. We also control for whether business owners have limited liability in the case of bankruptcy, which could affect their economic motive to secure stakeholder support. Moreover, we take a firm's share capital and multiply it with the largest ownership share in order to adjust for the potential economic loss of the most important investor in the case of bankruptcy.[9]

Lastly, we collect detailed regional data to account for variation at the district level that might exert an influence on proenvironmental behavior by firms. First, we control for business tax revenue in the respective electoral district (in EUR per inhabitant; all district-level indicators are provided for the year 2011 by the office of the Federal Returning Officer), to adjust for the size of a local market as well as the general economic activity in a region. Second, and in a similar vein, we include unemployment rates (in percent) in our regressions. Third, we control for the share of school graduates (in percent) that obtained the general higher education entrance qualification ("Abitur", equivalent to the "A levels" in the UK) in the respective year, in order to adjust for human capital differences across districts. Lastly, we account for the number of businesses

[9] Since information about the share capital is only available for incorporated companies with limited liability, we set this variable to zero for unincorporated firms. Since we control for limited liability in our regressions, this should not affect our results.

operating in the mining and manufacturing industries (per 1,000 registered businesses), because these are potentially the most heavily polluting firms.

Instrumental Variable Models

Our goal is to estimate the effect of ecological community logics, as manifested in above national average results for the Green Party, on green innovation initiatives by firms located in that community. To this end, we need to account for the possibility that the popularity of the Greens in a district might be endogenously determined. We therefore opt for an instrumental variable approach, in which we instrument district-level election results with the share of young inhabitants in a district aged between 18 and 35 years old (measured in percent for the year 2008). This instrument is assumed to be *relevant* because the Green Party has traditionally been more popular among young voters in Germany (Decker, 2018; Kobold & Schmiedel, 2018). This assumption is supported by our first-stage regression results, which we discuss below. Furthermore, we argue that the instrument is *excludable*, since the demographic situation in an electoral district in 2008 should only have a negligible direct impact on proenvironmental behavior at the firm-level in 2012 to 2014. In particular, we expect this to be the case after controlling for district-level business tax revenues, unemployment rates, and the share of graduates with a university-entrance diploma. These variables account for the size of the local market as well as local labor market conditions and are thus able to block a possible influence of demographics on innovations via demand-side effects and the supply of human capital. Given these assumptions, the share of young inhabitants is a valid instrument, because it affects the dependent variable, green innovations, only via its

influence on ecological community logics (we test the robustness of our results to violations of these assumptions in a sensitivity analysis below).

Since our endogenous regressor is binary, we follow Wooldridge (2002, chapter 18.4.1) and augment the traditional two-stage least squares (2SLS) estimator with an additional step, in which we first regress green party voting on our instrument as well as all control variables in a Probit model. We then compute predicted probabilities from this model and use them as an instrument in the first stage of a subsequent standard 2SLS. As Wooldridge shows, this approach leads to considerable efficiency gains if the endogenous regressor is a dummy. Furthermore, it has desirable robustness properties, because the particular model choice in the auxiliary step (i.e., the choice whether to estimate the predicted probabilities of green party voting, e.g., via probit or logit) does not matter for consistency.

Throughout our analyses, we employ heteroskedasticity-robust standard errors (White, 1980). The fact that we use predicted probabilities as instruments in the 2SLS does thereby not affect the validity of standard errors because of the linear projection that is carried out in the first stage (Lee, 1996). However, we bootstrap standard errors when the composite index of ownership identifiability is used as a moderator, since here the fact that we estimate the regressor from a mixed data PCA renders analytical standard errors invalid.

RESULTS

Descriptive statistics and pairwise correlations are reported in Table 1. Our dependent variable shows a mean of 2.94 on a scale of zero to thirteen, which signifies moderate levels of green innovation activities. However, there is considerable variance in firm responses, which is reflected in a standard deviation equal to 3.38. About 45 percent of firms in our sample reside in regions

with heightened ecological community pressure, as reflected by green party votes above the result at the federal level. The rate of family ownership (71 percent of cases) and average ownership concentration (value of 0.65) are relatively high, as can be expected for our sample of mainly privately-held firms. About 41 percent of firms in the sample carry the name of one of their owners in the company name and for 65 percent of firms, owners live on average less than ten kilometers away from the company address. Finally, the indicators for identifiable owners are only weakly correlated, which means that they capture different dimensions of ownership identifiability.

Insert Table 1 about here

Following Wooldridge (2002), we first estimate predicted probabilities of green party voting from a Probit model, which includes our instrument and controls, in order to use them in a subsequent 2SLS regression. Probit results show that our instrument – the share of young inhabitants between 18 and 35 – exerts a strong influence on green party voting. We find a point estimate for the coefficient equal to 0.129 ($p = 0.000$, $CI_{95} = [0.097; 0.162]$) and an average marginal effect on the predicted probability of 0.032 ($p = 0.000$, $CI_{95} = [0.025; 0.040]$). This result provides support for our assumption that the instrument is relevant and strong.[10]

Table 2 reports our 2SLS results. In column 1, we find a positive and significant effect of green party voting on green innovations, which is equal to 2.136 ($p = 0.000$, $CI_{95} = [1.026; 3.246]$). Given that our dependent variable has a standard deviation of 3.38, this coefficient implies that green innovations score 0.63 standard deviations higher if the Green Party scores above the national average in an electoral district. This result provides strong support for hypothesis 1.

[10] We do not report full Probit regression results in order to save space. They are available upon request, however.

In column 2 of Table 2, we find a positive and significant interaction of green party voting with the level of ownership concentration, which equals 1.134 ($p = 0.051$, $CI_{95} = [-0.007; 2.274]$). The interaction with family ownership is positive and significant in column 3, with a point estimate equal to 1.247 ($p = 0.001$, $CI_{95} = [0.495; 2.000]$). Further, in column 4, the estimated interaction with branded ownership is found to be 0.914 ($p = 0.028$, $CI_{95} = [0.097; 1.730]$). In column 5, the interaction effect of green party voting and local ownership is equal to 0.779 ($p = 0.042$, $CI_{95} = [0.027; 1.532]$), which is smaller in magnitude than the previous point estimates, but statistically significant. Eventually, in column 6, we find a positive and significant interaction with the composite index of ownership identifiability, obtained from the mixed data PCA, which is equal to 0.445 ($p = 0.001$, $CI_{95} = [0.192; 0.698]$). In the same regression, we get an estimated coefficient of 2.186 ($p = 0.000$, $CI_{95} = [1.020; 3.352]$) for the main effect of green party voting. This implies that if ownership identifiability goes up by one standard deviation (= 1.36), the effect of green party voting on green innovations becomes larger by about 28 percent. Taken together, these results provide strong evidence in favor of hypothesis 2.[11]

Insert Table 2 about here

Robustness Checks

We explore the robustness of our results to different cutoff choices (i.e., 5km, 10km, 15km, 20km, and 30km) for the average distance between owners' domiciles and company addresses in the construction of our local ownership indicator. We find a significant interaction effect with green voting up to a threshold of 15km. Above that distance, point estimates remain similar, but their larger variance leads to statistical insignificance. Furthermore, we check what happens if we use

[11] In unreported OLS regressions, we consistently find smaller effects compared to the instrumental variable results in Table 2. This is in line with the interpretation that less environmental-friendly behavior by firms is positively related to public sentiments in favor of the Green Party, which in turn induces a downward bias in simple OLS.

distance as a continuous moderator in our instrumental variable regressions. In line with our theory, we find a negative coefficient for the interaction term (= -0.009), with a p-value that approaches significance at the 10-percent level only ($p = 0.103$). We interpret these less clear-cut results when using a specification with a continuous moderator as evidence in favor of our previous operationalization, which supposes a threshold level for the effect of owners' local embeddedness at relatively short distances.

We measure green voting with a time lag of three to five years, as the 2009 federal elections in Germany were the last elections conducted before our survey period. However, some innovations induced by proenvironmental institutional pressure might also happen in a shorter time frame. To test how our results change when looking at shorter intervals, we conduct a robustness check in which we use green voting shares from the subsequent federal elections in 2013 as proxy for ecological community logics. Furthermore, we also look at changes in the green voting share between 2009 and 2013 to exclude level effects in green sentiment across regions. Both analyses produce results that are very similar to our baseline.

In our main specifications, we use a binary measure for green party voting. This is justified from a theoretical point of view because the result at the national level serves as a reference point and is decisive for the composition of parliament. Furthermore, a binary variable results in higher statistical power, which is crucial in instrumental variable models with interaction terms. In robustness checks using a continuous green voting share, we similarly find support for hypothesis 1 as well as hypothesis 2, based on the composite index of owner identifiability. When looking at the individual identifiability indicators for hypothesis 2, the interactions of green voting share with family and local ownership, resp., are statistically significant; point estimates of these interactions for concentrated and branded ownership preserve signs but fail to reach significance.

Since our dependent variables takes values from zero to thirteen, we also re-estimate the specifications in Table 2 using a Poisson regression model that accounts for the presence of endogenous regressors (Wooldridge, 2002, chapter 19.5.1). Estimation is carried out by the generalized method of moments (GMM). We find qualitatively similar results that support both of our hypotheses. Since conclusions remain robust, for efficiency reasons we give preference to the more sparsely parametrized 2SLS over count data models as our main specification, however.

The CIS survey questionnaire asks respondents to assess the significance of the environmental benefits that result from the introduction of the innovations measured by our dependent variable. We do not use this information in our main specifications because of the subjective nature of the assessment. However, we find qualitatively similar results if we restrict ourselves only to innovations with environmental benefits perceived to be of high significance by the respondent.

One potential concern in our empirical setting is that the share of young adults might have an influence on the demand for environmental-friendly products in a region, which could jeopardize instrument validity. Even though a direct demand-side effect should largely be prevented by controlling for business tax revenue, we take an additional step to check the robustness of our results by restricting the dependent variable, green innovations, to process innovations only. Reassuringly, we find qualitatively similar results, which increases our confidence in a causal interpretation of our estimates.

Another potential threat for instrument validity is that in particular young, innovative firms might be deliberately established in regions with a large young workforce. We address this concern by excluding firms that are younger than 6 years of age in the estimations. Our results remain robust to this exclusion.

Lastly, we make use of an additional item in the CIS survey, which asks family firm owners whether they intend to transfer the business to the next family generation in the future. We split our sample into family firms with and without these so-called *transgenerational intentions* (Chrisman & Patel, 2012). We do this because for family owners who intend to pass on their firm to their offspring, reacting to community pressure could be more strongly influenced by an economic survival motive in order to realize these intentions. Consistent with this idea, we find a smaller moderation effect of family ownership in firms without transgenerational intentions, which is still positive (= 1.019) and statistically different from zero (p = 0.016) though. Thus, the fact that a sizeable moderation effect remains, even if the economic survival argument is weakened (i.e., in family firms without transgenerational intentions), provides further evidence for the presence of noneconomic motives for reacting to community pressure. Detailed estimation results for all the robustness checks discussed in this section are available from the authors upon request.

Sensitivity Analysis

In the robustness checks section, we have already addressed several threats to instrument validity. However, given that the assumptions for instrumental variable estimation are strong, we perform an additional sensitivity analysis of our regression results. Following Cinelli and Hazlett (2020a,b), we assume the presence of unobserved variables U that are associated both with the dependent variable (*Green Innovations*) and the instrument (*Young Inhabitants*), and thus violate instrument validity. Such unobserved confounders could, for example, be related to owner preferences that simultaneously affect location choice and the innovativeness of a firm. Cinelli and Hazlett (2020b) devised a method to test how strong the association with U would need to be in order to drive down the coefficient of the treatment variable (*Green Party Voting*) in the 2SLS to zero. For the null

hypothesis H_0: $\beta_{IV} = 0$ this is particularly easy because the IV estimator is simply the ratio of the reduced-form estimate (when regressing the dependent variable on the instrument, plus controls) divided by the first-stage estimate (when regressing the treatment on the instrument, plus controls): $\beta_{IV} = \beta_{RF}/\beta_{FS}$. Therefore, testing how quickly β_{RF} vanishes to zero in the presence of unobserved confounding is at the same time also a test for $\beta_{IV} = 0$. And since the reduced form regression is a standard OLS, we can apply readily available tools for sensitivity analysis in linear models (Cinelli & Hazlett, 2020a).

For the sake of brevity, we analyze sensitivity for the baseline model in column 1 of Table 2 (with $\beta_{IV} = 2.136$). We find a robustness value of 0.07, implying that the strength of the association of the omitted variable with the treatment or outcome (expressed in terms of partial R^2) needs to be larger than this value in order to change the sign of β_{IV}. For comparison, *Firm Size*, one of the most important explanatory variables, exhibits a strength of association equal to $R^2_{Y\sim Z|D,\boldsymbol{X}} = 0.0043$ with the outcome. Figure 1 depicts this sensitivity analysis in a contour plot. It shows the reduced-form coefficient β_{RF} that would be obtained for different levels of residual variation of the unobserved confounder *U* with the instrument (x-axis) and the outcome (y-axis). The thick black line corresponds to β_{RF} equal to zero, which in turn would also imply a β_{IV} of zero. The diamond indicates the residual variation that a hypothetical confounder ten times stronger than the benchmark variable *Firm Size* would explain. In the presence of such a confounder, the obtained reduced-form estimate would be equal to 0.37. Hence, an omitted variable even ten times stronger than *Firm Size* would not be sufficient in order to overturn our qualitative conclusions.

Insert Figure 1 about here

DISCUSSION

This study offers several interesting ideas and findings. First, we find empirical support for the argument that proenvironmental logics at the community level influence the green innovation behavior of resident firms. Empirical research on how variance in green community logics shapes firm behavior is still emergent (e.g., Lee & Lounsbury, 2015; Tilleman et al., 2020), and the idea that normative institutional pressures can promote innovation as an organizational response is relatively new and underresearched (Berrone et al., 2013). By analyzing green party voting by electoral-district residents to gauge ecological community logics, and by employing time-lagged instrumental variable models, our study offers scarce causal evidence on this topic. Indeed, while we are not the first to model community pressures, measuring green logics at such granular local levels has proven challenging (cf. Dowell & Muthulingam, 2017, who used a state-level indicator for local norms). Local community stakeholders, who experience the firm up close, are less easily convinced by ceremonial or standardized practices and, as hypothesized, spur the introduction of green product and process innovations as a substantive response.

Second, this study deepens our understanding of the strategic role of ownership and how it creates heterogeneity in organizational responses to institutional pressures (cf. Greenwood et al., 2011). We introduced the construct of identifiable business ownership, and clarified that firms' susceptibility to community-level sustainability pressures hinges on the owners' identifiability or the ease with which externals can establish their identity. This ties in with earlier work, in other contexts, looking at the role of public visibility and recognition in reputation management (e.g., Rhee & Valdez, 2009). Using four indicators and a composite index, we find strong support for the idea that owner identifiability shapes companies' strategic response to institutional community pressures. Our finding of heterogeneous firm responses to community-level pressures enriches the

model by Marquis and colleagues (2007), which focused on within-community isomorphism in corporate actions. As we show, even when operating in the same community logic, companies differ greatly depending on the utility they derive from substantive responses.

We furthermore extend traditional institutional theoretic arguments – centered on gains in firm legitimacy and survival prospects (Meyer & Rowan, 1977; Scott, 1987) – by including second-order noneconomic gains in business owners' personal reputation in the cost-benefit analysis of organizational responses, and shed light on how owner identifiability triggers this noneconomic utility mechanism. Overall, by exploring the role of identifiable ownership and personal reputation in the link between institutional logics and organizational responses, we offer insight on the mechanisms by which macro-level institutions influence firm-level strategies – i.e., we provide additional insight into how and when institutional logics create pressure for change.

Our findings also have practical implications. For instance, a recently introduced EU directive (directive 2015/849 article 30) compels EU member states to set up a central register of ultimate beneficial owners (UBO) holding more than 25 percent of the votes or shares in a company, including for privately-held companies. In the implementation phase of this directive, a heated political debate took place about which parties have a "legitimate interest" and should therefore be granted access to this UBO-register, ranging from restricted access (e.g., only by governmental agencies) to broader access in which a wide set of stakeholders can get insight in the identity of a firm's main owners. Essentially, this debate on who gets access to the UBO-register revolves around the trade-off between privacy and transparency. While privacy concerns, as often voiced by corporate lobbyists, are certainly valid, our study points to an overlooked benefit of greater transparency with wider access to such registers, namely the fact that higher owner identifiability renders firms more susceptible to public (ecological) concerns.

Relatedly, the business ownership landscape is changing in the EU and beyond, with a mounting influence of distant and faceless institutional and foreign investors. Regarding the chances of obtaining substantive organizational responses to legitimate societal concerns, our study highlights the virtues of traditional family owners and other types of owners who are locally embedded. This points to the possibility of broader societal costs following the ongoing changes in the business ownership landscape.

To conclude, our study is not without limitations which suggest avenues for future research. First, our measure of green innovation is a subjective respondent-assessed measure drawn from the German CIS survey. Future work should employ more objective measures of both the novelty (e.g., new to the firm, sector, or world) and the ecological impact (e.g., effect on toxic emissions) of the process and product innovations introduced by firms. Second, with the data at hand, we were unable to empirically verify our argument on second-order noneconomic gains in business owners' personal reputation as a driver of the moderation effect by identifiability. To try and isolate this noneconomic rationale, we controlled as much as possible for variance in the motive of second-order economic gains in firm survival prospects, but future work may employ survey items that directly assess the role of business owners' personal reputation considerations. Third, it would be interesting to differentiate between green innovations that have mainly a local impact and those with a more global impact, to see whether ecological community pressures predominantly encourage the former, perhaps at the expense of the latter. Relatedly, recent work by Tilleman and colleagues (2020) suggests that institutional logics may affect particular green technologies differently, depending on the underlying technological uncertainty. We thus encourage future work to adopt a more fine-grained lens when analyzing different types of green innovations introduced

by resident firms. Lastly, our empirical results may be specific to our institutional setting, namely Germany, and the generalizability of our findings to other contexts remains to be tested.

REFERENCES

Aguinis, H., & Glavas, A. 2012. What we know and don't know about corporate social responsibility. ***Journal of Management***, 38: 932-968.

Alvesson, M., & Spicer, A. 2019. Neo-institutional theory and organization studies: A mid-life crisis? ***Organization Studies***, 40: 199-218.

Bammens, Y., & Hünermund, P. 2020. Nonfinancial considerations in eco-innovation decisions: The role of family ownership and reputation concerns. ***Journal of Product Innovation Management***, 37: 431-453.

Bansal, P., & Clelland, I. 2004. Talking trash: Legitimacy, impression management, and unsystematic risk in the context of the natural environment. ***Academy of Management Journal***, 47: 93-103.

Bansal, P., & Roth, K. 2000. Why companies go green: A model of ecological responsiveness. ***Academy of Management Journal***, 43: 717-736.

Bansal, P., & Song, H. 2017. Similar but not the same: Differentiating corporate sustainability from corporate responsibility. ***Academy of Management Annals***, 11: 105-149.

Berrone, P., Cruz, C., Gomez-Mejia, L., & Larraza-Kintana, M. 2010. Socioemotional wealth and corporate responses to institutional pressures: Do family-controlled firms pollute less?. ***Administrative Science Quarterly***, 55: 82-113.

Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L. 2013. Necessity as the mother of 'green' inventions: Institutional pressures and environmental innovations. ***Strategic Management Journal***, 34: 891-909.

Bush, J., Moffatt, S., & Dunn, C. 2001. `Even the birds round here cough': Stigma, air pollution and health in Teesside. ***Health & Place***, 7: 47-56.

Cabral, L. 2017. ***Introduction to Industrial Organization***, MIT Press: Cambridge, MA.

Carrillo-Hermosilla, J., del Rio, P., & Könnölä, T. 2010. Diversity of eco-innovations: Reflections from selected case studies. ***Journal of Cleaner Production***, 18: 1073-1083.

Cennamo, C., Berrone, P., Cruz, C., & Gomez-Mejia, L. 2012. Socioemotional wealth and proactive stakeholder engagement: Why family-controlled firms care more about their stakeholders. ***Entrepreneurship Theory and Practice***, 36: 1153-1173.

Chavent, M., Kuentz, V., & Saracco, J. 2011. Orthogonal Rotation in PCAMIX. ***Advances in Classification and Data Analysis***, 6: 131-146.

Chavent, M., Kuentz-Simonet, V., Labenne, A., & Saracco, J. 2014. ***Multivariate Analysis of Mixed Data: ThePCAmixdata R Package***, arXiv:1411.4911.

Chrisman, J., & Patel, P. 2012. Variations in R&D investments of family and nonfamily firms: Behavioral agency and myopic loss aversion perspectives. ***Academy of Management Journal***, 55: 976–997.

Cinelli, C., & Hazlett, C. 2020a. Making Sense of Sensitivity. Extending Omitted Variable Bias. ***Journal of the Royal Statistical Society: Series B (Statistical Methodology)***, 82: 39–67.

Cinelli, C., & Hazlett, C. 2020b. ***An Omitted Variable Bias Framework for Sensitivity Analysis of Instrumental Variable***s. Mimeo.

Coan, T., & Holman, M. 2008. Voting Green. ***Social Science Quarterly***, 89: 1121-1135.
Connelly, B., Hoskisson, R., Tihanyi, L., & Certo, S. 2010. Ownership as a form of corporate governance. ***Journal of Management Studies***, 47: 1561–1589.
Dalton, D., Hitt, M., Certo, S., & Dalton, C. 2007. The fundamental agency problem and its mitigation: Independence, equity, and the market for corporate control. ***Academy of Management Annals***, 1: 1-64.
Deephouse, D., & Carter, S. 2005. An examination of differences between organizational legitimacy and organizational reputation. ***Journal of Management Studies***, 12: 329-360.
Deephouse, D., & Jaskiewicz, P. 2013. Do family firms have better reputations than non-family firms? An integration of socioemotional wealth and social identity theories. ***Journal of Management Studies***, 50: 337-360.
Decker, F. 2018. ***Wahlergebnisse und Wählerschaft der GRÜNEN***. Bundeszentrale für politische Bildung. Available at: https://www.bpb.de/politik/grundfragen/parteien-in-deutschland/gruene/42159/wahlergebnisse-und-waehlerschaft.
Delmas, M., & Toffel, M. 2004. Stakeholders and environmental management practices: An institutional framework. ***Business Strategy and the Environment***, 13: 209-222.
Delmas, M., & Toffel, M. 2008. Organizational responses to environmental demands: Opening the black box. ***Strategic Management Journal***, 29: 1027-1055.
DiMaggio, P., & Powell, W. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. ***American Sociological Review***, 48: 147-160.
Dowell, G., & Muthulingam, S. 2017. Will firms go green if it pays? The impact of disruption, cost, and external factors on the adoption of environmental initiatives. ***Strategic Management Journal***, 38: 1287-1304.
Durand, R., Hawn, O., & Ioannou, I. 2019. Willing and able: A general model of organizational responses to normative pressures. ***Academy of Management Review***, 44: 299-320.
Durand, R., & Thornton, P. 2018. Categorizing institutional logics, institutionalizing categories: A review of two literatures. ***Academy of Management Annals***, 12: 631-658.
Edwards, J. 2011. The fallacy of formative measurement. ***Organizational Research Methods***, 14: 370–380.
Etzion, D. 2007. Research on organizations and the natural environment, 1992-present: A review. ***Journal of Management***, 33: 637-664.
European Commission 2009. ***Overview of Family-business-relevant Issues: Research, Networks, Policy Measures and Existing Studies***. Available at: https://ec.europa.eu/docsroom/documents/10388/attachments/1/translations/en/renditions/pdf.
European Commission 2017. ***Special Eurobarometer 459: Climate Change***. Available at: https://ec.europa.eu/clima/sites/clima/files/support/docs/report_2017_en.pdf.
Flammer, C. 2013. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. ***Academy of Management Journal***, 56: 758-781.
Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. ***Academy of Management Journal***, 33: 233-258.
Gomez-Mejia, L., Cruz, C., Berrone, P., & De Castro, J. 2011. The bind that ties: Socioemotional wealth preservation in family firms. ***Academy of Management Annals***, 5: 653–707.
Greenwood, R., & Hinings, C. 1996. Understanding radical organizational change: Bringing together the old and the new institutionalism. ***Academy of Management Review***, 21: 1022-1054.

Greenwood, R., Diaz, A., Li, S., & Lorente, J. 2010. The multiplicity of institutional logics and the heterogeneity of organizational responses. ***Organization Science***, 21: 521-539.
Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E., & Lounsbury, M. 2011. Institutional complexity and organizational responses. ***Academy of Management Annals***, 5: 317-371.
Harrison, J., Boivie, S., Sharp, N., & Gentry, R. (2018). Saving face: How exit in response to negative press and star analyst downgrades reflects reputation maintenance by directors. ***Academy of Management Journal***, 61: 1131-1157.
Horsky, D., & Swyngedouw, P. 1987. Does it pay to change your company's name? A stock market perspective. ***Marketing Science***, 6: 320-335.
Jansson, A. 2013. "Real owners" and "common investors": Institutional logics and the media as a governance mechanism. ***Corporate Governance: An International Review***, 21: 7-25.
Jennings, P., & Zandbergen, P. 1995. Ecologically sustainable organizations: An institutional approach. ***Academy of Management Review***, 20: 1015-1052.
Jiang, R., & Bansal, P. 2003. Seeing the need for ISO 14001. ***Journal of Management Studies***, 40: 1047-1067.
Kahle, D., & Wickham, H. 2013. ggmap: Spatial Visualization with ggplot2. ***The R Journal***, 5: 144-161.
Kahneman, D., & Tversky, A. 1979. Prospect theory: An analysis of decision under risk. ***Econometrica***, 47: 263–291.
Kline, R. 2011. ***Principles and Practice of Structural Equation Modeling***, Guilford Press: New York.
Kobold, K., & Schmiedel, S. 2018. Wahlverhalten bei der Bundestagswahl 2017 nach Geschlecht und Alter. ***WISTA – Wirtschaft und Statistik***, Statistisches Bundesamt, June: 142–156.
Kumar, P., & Zattoni, A. 2015. Editorial: Ownership structure, corporate governance and firm performance. ***Corporate Governance: An International Review***, 23: 469-471.
Lee, M. 1996. ***Methods of Moments and Semiparametric Econometrics for Limited Dependent Variable Models***, Springer: New York.
Lee, M., & Lounsbury, M. 2015. Filtering institutional logics: Community logic variation and differential responses to the institutional complexity of toxic waste. ***Organization Science***, 26: 847-866.
Marquis, C., Glynn, M. & Davis, G. (2007). Community isomorphism and corporate social action. ***Academy of Management Review***, 32: 925-945.
Meek, W., Pacheco, D., & York, J. 2010. The impact of social norms on entrepreneurial action: Evidence from the environmental entrepreneurship context. ***Journal of Business Venturing,*** 25: 493–509.
Meyer, J., & Rowan, B. 1977. Institutionalized organizations: Formal structure as myth and ceremony. ***American Journal of Sociology***, 83: 340-363.
Minichilli, A., Prencipe, A., Radhakrishnan, S., & Siciliano, G. (2021). What's in a name? Eponymous private firms and financial reporting quality. ***Management Science***, in press.
Niehm, L., Swinney, J., & Miller, N. 2008. Community social responsibility and its consequences for family business performance. ***Journal of Small Business Management***, 46: 331–350.
OECD 2005. ***Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data***, OECD: Paris.

Peters, B., & Rammer, C. 2013. Innovation panel surveys in Germany. Gault F., ed. ***Handbook of Innovation Indicators and Measurement***, Edward Elgar Publishing: Cheltenham, UK, 135–177.

Rhee, M. & Valdez, M. (2009). Contextual factors surrounding reputation damage with potential implications for reputation repair. ***Academy of Management Review***, 34: 146-168.

Scott, W. 1987. The adolescence of institutional theory. ***Administrative Science Quarterly***, 32: 493-511.

Scott, W. 2003. Institutional carriers: Reviewing modes of transporting ideas over time and space and considering their consequences. ***Industrial and Corporate Change***, 12: 879-894.

Scott, W. 2008. Approaching adulthood: The maturing of institutional theory. ***Theory and Society***, 37: 427-442.

Selznick, P. 1996. Institutionalism "old" and "new". ***Administrative Science Quarterly***, 41: 270-277.

Setia-Atmaja, L. 2009. Governance mechanisms and firm value: The impact of ownership concentration and dividends. ***Corporate Governance: An International Review***, 17: 694-709.

Sharma, S. 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. ***Academy of Management Journal***, 43: 681-697.

Sine, W., & Lee, B. 2009. Tilting at windmills? The environmental movement and the emergence of the U.S. wind energy sector. ***Administrative Science Quarterly***, 54: 123–155.

Tadelis, S. 1999. What's in a name? Reputation as a tradeable asset. ***American Economic Review***, 89: 548-563.

Thomsen, S., & Pedersen, T. 2000. Ownership structure and economic performance in the largest European companies. ***Strategic Management Journal***, 21: 689–705.

Thornton, P. 2004. ***Markets from Culture: Institutional Logics and Organizational Decisions in Higher Education Publishing***. Stanford, CA: Stanford University Press.

Thornton, P., & Ocasio, W. 1999. Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958-1990. ***American Journal of Sociology***, 105: 801-843.

Tilleman, S., Russo, M., & Nelson, A. (2020). Institutional logics and technology development: Evidence from the wind and solar energy industries. ***Organization Science***, 31: 649-670.

White, H. 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. ***Econometrica***, 48: 817–838.

Wooldridge, J. 2002. ***Econometric Analysis of Cross Section and Panel Data***, MIT Press: Cambridge, MA.

Yan, S., Almandoz, J., & Ferraro, F. 2021. The impact of logic (in)compatibility: Green investing, state policy, and corporate environmental performance. ***Administrative Science Quarterly***, in press.

York, J., Hargrave, T., & Pacheco, D. 2016. Converging winds: Logic hybridization in the Colorado wind energy field. ***Academy of Management Journal***, 59: 579-610.

TABLES AND FIGURES

Table 1: Descriptive statistics

	Mean	Std. Dev.	Pairwise Correlations																	
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Green Innovations	2.94	3.38	1.00																		
(2) Green Party Voting	0.45	0.50	0.01	1.00																	
(3) Concentrated Ownership	0.65	0.32	-0.02	0.00	1.00																
(4) Family Ownership	0.71	0.45	0.15	0.00	0.22	1.00															
(5) Branded Ownership	0.41	0.49	0.06	-0.04	0.25	0.29	1.00														
(6) Local Ownership	0.65	0.48	0.02	-0.01	0.29	0.17	0.26	1.00													
(7) Ownership Identifiability	0.38	1.36	0.08	-0.02	0.67	0.61	0.70	0.66	1.00												
(8) Firm Size	75.55	406.79	0.09	0.01	-0.06	-0.03	0.01	-0.05	-0.05	1.00											
(9) Credit Rating	234.72	49.52	-0.08	0.05	0.13	-0.03	-0.02	0.04	0.05	-0.10	1.00										
(10) Share Capital	0.97	14.68	0.02	0.02	-0.01	-0.05	-0.04	-0.02	-0.04	0.10	-0.09	1.00									
(11) Age	32.86	34.02	0.12	0.02	-0.05	0.11	0.13	0.05	0.09	0.08	-0.24	0.10	1.00								
(12) Exporter	0.47	0.50	0.16	-0.03	-0.18	0.12	-0.10	-0.11	-0.11	0.06	-0.12	-0.01	0.10	1.00							
(13) Group	0.11	0.32	0.13	0.02	-0.21	-0.01	-0.05	-0.15	-0.16	0.16	-0.09	0.04	0.06	0.11	1.00						
(14) Limited Liability	0.77	0.42	0.02	0.02	-0.33	0.01	-0.23	-0.19	-0.29	0.02	0.11	-0.07	-0.13	0.26	0.08	1.00					
(15) Eastern Germany	0.34	0.47	-0.13	-0.26	-0.05	-0.21	-0.13	-0.08	-0.17	-0.05	0.02	-0.03	-0.24	-0.11	-0.04	0.00	1.00				
(16) Business Tax Revenue	426.47	198.80	0.05	0.36	0.00	0.10	0.03	0.01	0.05	0.03	0.01	0.02	0.08	0.03	0.03	0.04	-0.46	1.00			
(17) Unemployment Rate	6.21	2.79	-0.12	-0.42	-0.04	-0.16	-0.11	-0.09	-0.15	-0.05	-0.02	0.04	-0.14	-0.10	-0.03	-0.01	0.64	-0.40	1.00		
(18) High School Graduates	33.69	6.90	-0.02	0.07	-0.04	-0.05	-0.06	-0.08	-0.09	0.02	0.05	0.02	0.00	-0.03	0.01	0.05	-0.07	0.25	0.14	1.00	
(19) Manufacturing Share	0.67	0.27	0.05	-0.23	0.03	0.11	0.13	0.09	0.13	0.00	-0.04	-0.03	0.07	0.12	-0.02	-0.03	-0.06	-0.05	-0.28	-0.57	1.00
(20) Young Inhabitants (18–35)	19.37	2.00	0.00	0.07	-0.03	-0.04	-0.06	-0.04	-0.06	-0.03	0.01	0.02	-0.03	-0.06	-0.02	-0.01	0.04	0.14	0.17	0.26	-0.13

Table 2: Instrumental variable regression results

	(1)	(2)	(3)	(4)	(5)	(6)[a]
Green Party Voting	2.136	1.406	1.313	1.852	1.674	2.186
	(0.000)	(0.033)	(0.023)	(0.001)	(0.004)	(0.000)
Concentrated Ownership		-0.418				
		(0.210)				
Green Party Voting		1.134				
× Concentrated Ownership		(0.051)				
Family Ownership			0.013			
			(0.953)			
Green Party Voting			1.247			
× Family Ownership			(0.001)			
Branded Ownership				-0.213		
				(0.334)		
Green Party Voting				0.914		
× Branded Ownership				(0.028)		
Local Ownership					-0.157	
					(0.469)	
Green Party Voting					0.779	
× Local Ownership					(0.042)	
Ownership Identifiability						-0.030
						(0.678)
Green Party Voting						0.445
× Ownership Identifiability						(0.001)
Firm Size	0.001	0.001	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Credit Rating	-0.004	-0.004	-0.003	-0.004	-0.004	-0.004
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)
Share Capital	0.003	0.003	0.004	0.003	0.002	0.004
	(0.124)	(0.126)	(0.033)	(0.082)	(0.179)	(0.750)
Age	0.004	0.004	0.003	0.004	0.004	0.004
	(0.049)	(0.047)	(0.084)	(0.068)	(0.056)	(0.067)
Exporter	0.676	0.686	0.645	0.704	0.682	0.720
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Group	0.972	0.993	0.987	0.980	1.001	1.063
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Limited Liability	0.046	0.051	0.039	0.079	0.075	0.186
	(0.774)	(0.762)	(0.811)	(0.634)	(0.645)	(0.250)
Eastern Germany	-0.647	-0.640	-0.566	-0.627	-0.630	-0.570
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.004)
Business Tax Revenue	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.015)	(0.013)	(0.009)	(0.012)	(0.016)	(0.013)
Unemployment Rate	0.126	0.126	0.128	0.131	0.130	0.133
	(0.032)	(0.031)	(0.029)	(0.027)	(0.027)	(0.025)
High School Graduates	0.024	0.024	0.028	0.026	0.025	0.029
	(0.091)	(0.082)	(0.045)	(0.062)	(0.070)	(0.038)
Manufacturing Share	1.535	1.520	1.592	1.611	1.558	1.573
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
Constant	1.352	1.608	1.079	1.191	1.273	0.907
	(0.223)	(0.154)	(0.334)	(0.290)	(0.255)	(0.421)
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cragg-Donald Wald F Statistic	227.9	114.0	111.7	111.3	112.5	110.8

Notes: N = 2825. P-values in parentheses based on heteroskedasticity-robust standard errors. *Green Party Voting* instrumented by *Young Inhabitants (18–35)*. [a] Standard errors in model (6) are bootstrapped with 200 repetitions.

Figure 1: Contour plot sensitivity analysis