

RESEARCH ARTICLE

Firm ownership and ESG performance in European agri-food companies: The mediating effect of risk-taking and time horizon

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Abstract

The environmental, social, and corporate governance (ESG) performance of European agri-food companies is crucial amidst sustainability challenges. Employing property rights and agency theory, we investigate the influence of firm ownership structure on ESG performance, and the mediating role of risk-taking and time horizon. A recursive system of equations is employed to test the model using data from 936 European firms. The findings indicate that investor-owned firms (IOFs) outperform family firms and cooperatives in terms of ESG performance. Family firms demonstrate a longer time horizon, while IOFs exhibit greater risk-taking. Risk-taking and time horizon are positively and negatively associated with ESG performance, respectively. However, we find no evidence of a mediation effect. This paper contributes to the agency and property rights literature by exploring the implications of ownership structure for other firm characteristics and ESG performance, and outlines implications for policy-makers and managers in the development of focused interventions towards sustainability.

KEYWORDS

agri-food, ESG, ownership structure, risk-taking, time horizon

1 | INTRODUCTION

The agri-food industry is an economically and politically significant sector in Europe with substantial environmental, social, and governance (ESG) challenges (Joshi et al., 2023). The European agri-food sector's dependence on diminishing natural resources (Westhoek et al., 2016), and its impact on animal welfare, the environment, and labour conditions (Hartmann, 2011) have contributed to its reputation and legitimacy problems (Heyder & Theuvsen, 2012). These sustainability concerns have put European agribusiness under increasing pressure from stakeholders to improve their ESG performance (Engida et al., 2018). ESG improvements require adjustments in business

strategy and operations, as well as reconsidering business design and organisation (Long et al., 2018).

Firm ownership acts as a cornerstone for ESG performance by determining other firm characteristics such as capital structure, goals, governance structure, and strategy (Bushee, 2004; Tetrault Sirsly & Sur, 2013), shaping the foundation for ESG initiatives. The agri-food sector exhibits three particular ownership structures each with its unique characteristics. First, investor-owned firms (IOFs) are owned, controlled, and benefited by shareholders, with the main objective of maximising financial returns and shareholder value (Zhou et al., 2015). Second, cooperatives are member-owned enterprises (Katz, 1997), aiming to "realise the common economic, social, and cultural needs"

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of their members (D'Amato et al., 2021, p. 35). While in an IOF control belongs to (representatives of) equity investors, in a cooperative the members (i.e., farmers) have formal control over decisions (Hendrikse & Veerman, 2001). Third, family firms (FFs) are firms “governed and/or managed with the intention of shaping and pursuing the vision held by members of the same family” to preserve the firm as a legacy for future generations (Dangelico et al., 2019, p. 1434). FFs are driven by the goals of maximising family income and socio-emotional wealth (SEW), “non-financial aspects of the firm that satisfy the affective needs of the family, such as identity, the ability to exert family influence, and the perpetuation of the family dynasty” (Gómez-Mejía et al., 2007, p. 106). In short, these ownership structures fundamentally differ in their goals and governance, impacting their attitude towards ESG.

Effective ESG initiatives require a shift in the firm's focus from the short term to the long term (Stein, 1989; Li & Wu, 2020), the pursuit of innovation and transformation, which entail taking more risk (Mullens, 2018). Thus, time horizon and risk-taking behaviour have an impact on ESG performance (Slawinski & Bansal, 2012; Tan & Ann, 2023). Ownership structures differ in their goals and degree of portfolio diversification, which determine their time horizon and risk-taking (Gursoy & Aydogan, 2002). Because of their objective of maximising shareholder value, IOFs are more prone to short time horizons than FFs, which aim to secure a legacy for future generations (Zellweger & Sieger, 2012). Cooperatives have a long-term focus, as their members want to secure the farm for the next generations. However, cooperatives often exhibit a horizon problem due to the heterogeneity of their members' time horizons (Cook, 1995). In terms of risk, family owners often have most of their wealth concentrated in the business, and cooperatives are mainly financed by members' equity, exposing them to greater risks than investors with a diversified portfolio (Barry et al., 2011). As a result, FFs and cooperatives tend to be more risk-averse compared with IOFs. These arguments suggest that the relationship between ownership and ESG is mediated by the firm's time horizon and its risk-taking behaviour.

Despite the growing academic interest in linking ESG performance, corporate governance, and firm characteristics, several knowledge gaps remain. First, many studies on the sustainability performance of the agri-food sector focus only on cooperatives or IOFs, or make a comparison between the two (e.g., Mayo, 2011; Pennerstorfer & Weiss, 2013), while family ownership has historically been underrepresented (Baker & Anderson, 2010). As has been pointed out by previous studies, there is a need for greater focus on the role of firm governance and its impact on firm's commitment to sustainability in the agrifood sector (Conca et al., 2021). Second, studies on the relation between ownership structure and sustainability of the agri-food sector focus mainly on financial performance and efficiency (Soboh et al., 2012; Terreros & Górriz, 2011). Environmental, social, and multidimensional measures remain understudied (Hayati et al., 2010). Additionally, studies mostly measure sustainability at the farm level (Darnhofer et al., 2010; Toma et al., 2017). Third, ESG performance has usually been studied as an independent variable to assess its impact on financial performance (Li et al., 2021). The studies

that include ESG as a dependent variable either do not consider ownership structure or focus on ownership concentration and institutional ownership (Lavin & Montecinos-Pearce, 2021; Wu et al., 2022). Fourth, there is no examination of risk-taking, time horizon, and their relation with firm ownership structure and ESG.

To address these gaps, this paper assesses the relationship between firm ownership structure, risk-taking, time horizon, and their impact on the ESG performance of European agri-food companies, by testing a mediation model among the four variables. This study contributes to the existing literature in two significant ways. Firstly, it broadens the body of knowledge by analysing how firm ownership structure can be a critical variable that directly and indirectly influences ESG performance. Furthermore, the research uncovers the role of the previously neglected firm characteristics of risk-taking and time horizon in shaping firm sustainability strategy and behaviour. We find that IOFs exhibit a better ESG performance compared to family firms and cooperatives. Moreover, we find that family firms demonstrate a longer time horizon, while IOFs exhibit greater risk-taking, and that risk-taking and time horizon are positively and negatively associated with ESG performance, respectively. The results highlight notable distinctions in the objectives and governance frameworks of cooperatives, family firms (FFs), and IOFs, which bear implications for firm sustainability behaviour and performance. These findings are in line with the property rights and agency theories, positing that ownership structure shapes firm investment strategies and decision-making incentives by delineating the distribution of residual rights and the agency dynamics within the organisation.

The following section presents the theoretical background and develops the hypotheses. This is followed by the description of the methodology and data. Results are presented in Section 4 and the paper concludes with the discussion, limitations, and implications.

2 | THEORETICAL MODEL AND HYPOTHESES

We employ property rights and agency theory to predict how ownership structure defines firm characteristics and their impact on ESG performance. These two theories are connected to two types of incentive problems in organisations: investment-related problems, conceptualised by property rights theory, which concern the obligations, rights, and risks of residual claimants; and decision-related problems, derived from agency theory, which relate to the contracts by which decision-making processes are designed (Borgen, 2004).

Property rights over assets are the rights of individuals to decide on and obtain income from these assets (Fulton, 1995). Property rights have implications for the protection of, and investment in the assets over which owners have rights, and how owners prioritise activities to which they devote scarce resources (Huang, 2022). Property rights are therefore important in creating incentives to invest in ESG.

Agency theory explains how agency problems arise from the separation of decision-making and residual risk-bearing, as owners

(principals) delegate decision-making authority to managers (agents) (Jara-Bertin et al., 2008). When agents' interests differ from those of the principals, agents can exploit the principals' ownership rights through shirking (Fama & Jensen, 1983). This gives rise to agency costs: the costs of creating, monitoring, and enforcing contracts between principals and agents. Agency problems can impact ESG performance by creating inefficiencies in corporate governance and resource allocation towards ESG initiatives (Pranawaningsih & Anas, 2021). To mitigate agency problems, various internal and external control mechanisms have been suggested (Liang & Renneboog, 2018), but their availability and feasibility differ among companies with different ownership structures. Therefore, agency costs play an important role in decision-making on ESG initiatives.

In summary, property rights theory explains how ownership affects the incentives of owners to invest in ESG based on the obligations and risks they face over the assets they have rights over. The theory focuses on the allocation of decision-making authority based on ownership stakes, but it may overlook the inherent conflicts of interest among diverse stakeholders within an ownership structure. Agency theory complements property rights theory by addressing potential agency problems that arise from divergent objectives of principals and agents, and how they impact the decision-making process towards ESG initiatives (Jensen & Meckling, 1976).

2.1 | Ownership structure and ESG performance

Firm ownership structure determines the allocation of a firm's resources towards ESG initiatives, by defining property rights characteristics (their definition, allocation, transferability, and horizon) (Fulton, 1995; Kang & Sørensen, 1999), and the relationship between owners and decision-makers (Kim & Mahoney, 2005).

In cooperatives, farmer-members are the residual claimants to the income generated by the cooperative firm (Fulton, 1995), which incentivises them to steer the firm to operate in the most efficient way (Barzel, 1997). However, the property rights characteristics of cooperatives pose challenges for investing in ESG initiatives. First, unlike IOFs and FFs, where owners have clear property rights, cooperative members play different roles within the cooperative as owners and suppliers, and these multiple property rights may conflict (Krasnozhan, 2011). Second, the non-transferability of residual claims prevents members from obtaining an investment portfolio that accurately reflects their risk preferences, resulting in risk aversion.¹ Third, the common property problem leads to free-riding behaviour² (Mínguez Vera et al., 2010; Lopez-Bayon et al., 2018). These characteristics make farmer-members risk-averse and hesitant to invest additional equity capital in potentially risky ESG initiatives, while such

investments may be necessary for the success of ESG initiatives. Cooperatives also face two agency problems. The first issue arises from members having multiple roles, which leads to heterogeneous objectives. This creates challenges in defining organisational goals (Hansmann, 1988) and establishing effective mechanisms to control decision-making (Mínguez Vera et al., 2010). Second, the non-transferability of residual claims means that cooperatives are unable to use a market mechanism to control manager behaviour (Srinivasan & Phansalkar, 2003). These characteristics give rise to internal governance problems that hinder the achievement of uniform cooperative goals and its alignment with member objectives. Such internal governance issues create disincentives for farmer-member to actively participate in decision-making towards ESG initiatives and can lead to a misalignment between the cooperative's stated objectives and its achieved actions (Prause and Hoffmann, 2017; Mínguez Vera et al., 2010).

FFs have well-defined property rights, concentrated in the hands of family members. Based on property rights theory, FFs are generally risk-averse due to the large amount of personal wealth invested in the firm. Therefore, FFs may be less inclined to invest in ESG initiatives because they perceive them as risky investments (Rees & Rodionova, 2015). From an agency theory perspective, family ties align the interests, values, and practises of firm members (Dangelico et al., 2019), while the large proportion of ownership shares gives principals a strong incentive to closely monitor the behaviour and performance of agents (Fama & Jensen, 1983; Le Breton-Miller & Miller, 2006). This governance structure fosters better owner-management alignment and reduced information asymmetry between principal and agent (Bennedsen et al., 2010). While the strong control of family owners over firm decisions and resources reduces the principal-agent problem, it introduces principal-principal problems. Family members may use their power to promote their own interests, such as prioritising long-term stable cash flows and family control, while disregarding the interests of minority shareholders (Fama & Jensen, 1983). Thus, family ownership may lead to low ESG performance because FF decisions prioritise family goals such as the protection of financial and socio-emotional wealth.

IOFs are characterised by well-defined property rights in the hands of investors linked to the initial subscription or acquisition of equity in the capital market (Srinivasan & Phansalkar, 2003). Additionally, due to their presumed profit-maximisation objective, IOF owners place greater emphasis on ESG performance than cooperatives and FFs when it has strategic relevance (Cheng et al., 2015). The clearly defined property rights and their transferability facilitate appropriate incentives for investment in ESG. Investors typically own a small proportion of shares in numerous companies. Based on agency theory, this makes it difficult and costly for them to monitor managers (Easterbrook & Fischel, 1986). However, investors share a homogeneous goal and can use stock market signals as a control mechanism for evaluating management performance (Mínguez Vera et al., 2010). Unlike cooperatives and FFs, IOFs have access to both external and internal control mechanisms, which aid in the evaluation of management performance and ensure effective decision-making towards ESG initiatives.

¹It should be noted that cooperative members are not investors and do not possess an investment portfolio. However, for the purpose of comparison with IOFs and FFs, it is worth highlighting that their residual claims lack transferability and liquidity.

²Free riding occurs, for instance when a member supplies low-quality products, which result in additional costs for the cooperative to handle. These costs are then shared by all members. Another example of free riding is when new members receive equal benefits to established members.

Comparative empirical findings remain divided. Some studies find a negative relation between FFs and ESG (El Ghouli et al., 2016; Memili et al., 2018; Rees & Rodionova, 2013), while others find a positive one (Bingham et al., 2011; Rubino & Napoli, 2020). Comparisons between IOFs and cooperatives with respect to ESG performance are missing. To address the inconclusiveness of currently available empirical evidence, we aim to investigate whether there are differences in ESG performance between the three ownership structures, and if so which one exhibits a higher ESG performance. To achieve this, we test the following hypotheses:

H1a. IOFs exhibit better ESG performance than cooperatives.

H1b. IOFs exhibit better ESG performance than FFs.

2.2 | Ownership, risk-taking and ESG performance

Studies have found that risk orientation impacts attitudes towards specific behaviours, including engagement in sustainability activities (Tan & Ann, 2023). Firm risk-taking is an important determinant of firms' ESG performance, as the pursuit of sustainability requires firms to take risks and invest in opportunities with uncertain outcomes (Mullens, 2018). One could argue that the risks associated with potential reputational damage and costly sanctions due to not performing well on sustainability would increase the likelihood of ESG initiatives in risk averse firms (Chapple et al., 2013). However, these expected losses from not investing may or may not materialise (Hossain et al., 2022). In contrast, pursuing ESG initiatives places an immediate negative burden on a firm's finances, which may affect the short-term stability of the firm (Starks et al., 2017). Therefore, we expect that risk-averse firms would be less likely to pursue ESG initiatives, even if the marginal benefits of better ESG performance are expected to exceed the marginal costs in the long run.

Ownership structure influences firm risk-taking. IOFs presumably have a strong focus on profit maximisation, coupled with well-diversified portfolios of their shareholders. The transferability of property rights allows unrestricted risk sharing among residual claimants and the efficient allocation of risk (Chaddad & Iliopoulos, 2013). This gives IOFs the ability and willingness to take risks and introduce changes that require significant capital (Rees & Rodionova, 2013). FFs favour reliability, stability, and have been shown to exhibit a risk-averse organisational culture, which reduces incentives for entrepreneurial behaviour and new initiatives (De Massis et al., 2015). The goal of passing on the firm as a legacy across generations and the concentrated nature of their property rights, which increase the cost of risk-bearing (Fama & Jensen, 1983), make FFs risk-averse to ESG initiatives that could reduce SEW (Gómez-Mejía et al., 2007; Naldi et al., 2007; Schulze et al., 2002), firm's reputation (Bartholomeusz & Tanewski, 2006) or require changes to traditional family practises (Dangelico et al., 2019). In cooperatives, managerial investment decisions focus on providing the best goods and services to members.

Because members of cooperatives cannot quickly withdraw their capital contributions, they have also been shown to favour a risk-averse strategy (Van der Krogt et al., 2007). As ownership structure determines risk-taking behaviour, which in turn impacts firm investment in ESG initiatives, risk-taking may mediate the impact of ownership on ESG performance. Based on these arguments, we aim to investigate differences in the risk-taking behaviour between the different ownership structures and their impact on firm ESG performance, and test the following hypotheses:

H2a. IOFs exhibit higher risk-taking than cooperatives.

H2b. IOFs exhibit higher risk-taking than FFs.

H2c. Risk-taking is positively associated with ESG performance.

H2d. Risk-taking mediates the effect of firm ownership structure on ESG performance.

2.3 | Ownership, time horizon and ESG performance

ESG is a long-term approach by definition. Thus, firm time horizon is another crucial element in achieving ESG improvements (Arora & Dharwadkar, 2011; Faller & zu Knyphausen-Aufseß, 2018), by directly influencing a firm's strategic decisions and behaviour. A firm's time horizon has been defined as the period of time taken into consideration in strategic business decisions (Kavadi & Thomsen, 2023). Owners with a long time horizon focus more on the company's ESG performance because it is expected to have a positive impact on long-term performance, while owners with a short time horizon prioritise current earnings (Johnson & Greening, 1999). Therefore, we would expect a longer time horizon to be positively associated with ESG performance.

FFs aim to preserve the business for generations and therefore tend to have longer time horizons than non-FFs (Chua et al., 2009), indicating a propensity to invest in long-term sustainability initiatives (Anderson & Reeb, 2003). Through their property rights, family owners maintain strong control over the management of the firm (Rees & Rodionova, 2015). Therefore, family owners can reflect their time horizon in business decisions. Comparatively, IOFs tend to have a shorter time horizon, which is reflected in their objective. In cooperatives, the absence of the transferability of residual rights means that members' previous investments are not available to them if they decide to leave the cooperative (Cook, 1995). As members can only benefit from their investments within the horizon of their membership, each member has its own horizon (Terreros & Górriz, 2011). This leads to a preference for short-term investments and is particularly problematic when it comes to investing in ESG initiatives, as their benefits may materialise later than the expected horizon of many members. Thus, time horizon could be an underlying mechanism by which ownership influences ESG performance. Based on these

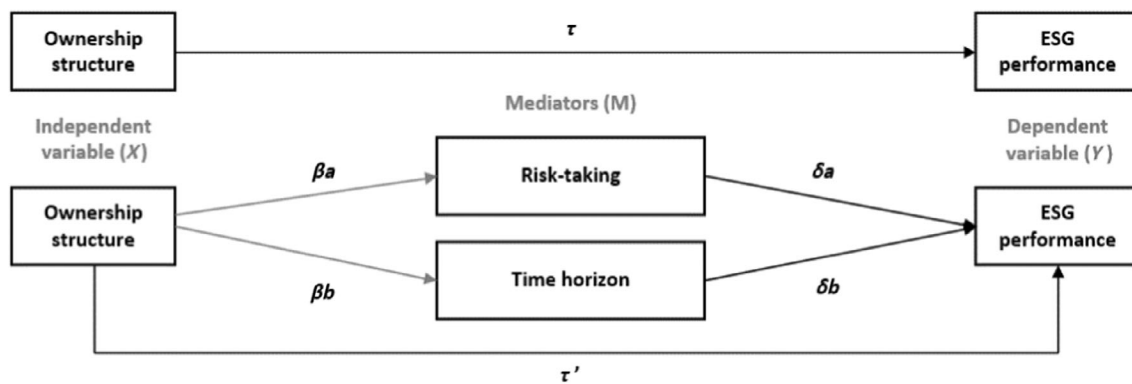


FIGURE 1 Theoretical framework.

considerations, we aim to investigate differences in the time-horizon between the different ownership structures and their impact on firm ESG performance, and test the following hypotheses:

- H3a.** FFs exhibit higher time horizon than IOFs.
- H3b.** FFs exhibit higher time horizon than cooperatives.
- H3c.** Time horizon is positively associated with ESG performance.
- H3d.** Time horizon mediates the effect of firm ownership structure on ESG performance.

The theoretical framework is illustrated in Figure 1, and a summary of the theoretical arguments is presented in Appendix 1.

3 | METHODOLOGY

3.1 | Sample

Cross-sectional data were obtained from the ORBIS Database for the year 2021 on food manufacturing companies with available ESG scores, from 14 EU Member States. The currency used throughout is euros. After cleaning the dataset from observations with missing values, the final sample consisted of 936 firms. The subsequent paragraphs provide a detailed explanation of the variables included in the analysis.

3.2 | Dependent variables

Following previous literature (Becchetti et al., 2023; Li & Wu, 2020), we constructed ESG performance by using RepRisk's ESG reputational risk metrics. RepRisk is a data science company that specialises in ESG research. To build the metrics, more than 100,000 media, regulatory, and business documents in 23 different languages are screened for problematic performance on 28-core ESG issues (RepRisk, n.d.). Incidents are assigned scores based on their impact, reach and novelty. Each firm's RepRisk index (RRI), on a scale ranging from 0 to 100, is

calculated based on event counts and their scores (more information in Data S1). We also included a second score as robustness check, the RepRisk rating (RRR), ranging from AAA to D, which factors in country and sector risk exposure alongside individual firm risk. RepRisk uses event-based data, thus, realised ESG outcomes, differentiating itself from other ESG ratings that rely on analyst evaluations or self-reported information (Li & Wu, 2020).

Our sample consisted of RepRisk-tracked firms, which we expect to have a larger company size and higher ESG-related media coverage than the average food company (Li & Wu, 2020). We performed a brief financial analysis of these RepRisk firms and contrasted them with a random sample of all European food production firms accessible in ORBIS for the year 2021. The data in Table 1 support the assumption that RepRisk firms are much larger and more profitable than the population medians.

3.3 | Independent variables

3.3.1 | Ownership structure

Firm's national legal form, shareholder names, and their direct and total ownership were extracted from ORBIS. Based on the criteria provided in Table 2, this information was used to create a categorical variable with three categories: IOF, cooperative, and FF.

To address concerns of reverse causality, we incorporated an alternative measure for FFs, which accounted for the presence of family members on the board, the management team, and ensured that the family owners are the original founders of the firm.

3.3.2 | Risk-taking

Returns volatility was taken as a proxy, where higher volatility reflects a higher degree of risk-taking. We focused on the volatility of accounting returns (as opposed to stock market returns) as the sample also includes privately held firms (Faccio et al., 2016). Following previous research (Andries et al., 2020; Paligorova, 2010), we measured the standard deviation of the firm's operating return on assets from the sample average over the 2018–2021 period:

		Sample groups	
		RepRisk (EU Food) companies	EU Food companies
		(n = 1821)	(n = 69,224)
Number of employees	Average	605	35
	Median	113	4
	SD	3079	520
Total assets	Average	214,240	12,419
	Median	32,935	633
	SD	1,331,571	274,776
Operating revenue	Average	280,431	12,425
	Median	57,729	264
	SD	1,019,203	174,246
Profit margin	Average	3.39	2.06
	Median	2.43	2.25
	SD	10.87	16.9
ROA	Average	3.33	1.85
	Median	2.87	2.07
	SD	10.91	16.8

Note: The unit for financials is thousands of euros.

TABLE 2 Ownership categorisation criteria.

Ownership type	Categorisation rules
FF	Individual or family members maintain majority ownership (directly or indirectly, at least >25%). If the firm is categorised as a one-person or sole company by the “National legal form” data in ORBIS, it is manually checked to ensure it is owned by a family based on the above criteria.
Alternative FF	Requires the family to have >50% ownership, be present on the board and/or management team, and be the original founders.
Cooperative	Classified as so by the “National legal form” data in ORBIS. The majority of shareholders (51%) are farmers, either directly or indirectly, via another cooperative or holding company (+ cooperative/farmers have preferred shares).
IOF	If indicated as so by the “National legal form” data in ORBIS. If no individual or family has more than 25% and if farmers or cooperatives are not the majority of shareholders.

TABLE 1 Sample comparison.

where i represents the firm, t = year, T = number of years of firm observations, N_t is the number of firms in year t ; EBITDA is earnings before interest, taxes, and depreciation. For each firm with available earnings and assets data, the deviation of a firm's EBITDA/Total assets from the sample average for the corresponding year is computed. Then, the standard deviation of this measure was used as a proxy for risk. As a robustness check, we accounted for country-level (c) influences and industry (k) economic cycle using country- and industry-adjusted dispersion of firm earnings (Risk-taking 2 and 3) (Boubakri et al., 2013; Faccio et al., 2011).

$$\text{Risk-taking}_2 = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(E_{i,c,t} - \frac{1}{T} \sum_{t=1}^T E_{i,c,t} \right)^2}, t = 2018 \dots 2021$$

$$E_{i,c,t} = \frac{\text{EBITDA}_{i,c,t}}{\text{Total assets}_{i,c,t}} - \frac{1}{N_{c,t}} \sum_{j=1}^{N_{c,t}} \frac{\text{EBITDA}_{j,c,t}}{\text{Total assets}_{j,c,t}},$$

$$\text{Risk-taking}_3 = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(E_{i,k,t} - \frac{1}{T} \sum_{t=1}^T E_{i,k,t} \right)^2}, t = 2018 \dots 2021$$

$$E_{i,k,t} = \frac{\text{EBITDA}_{i,k,t}}{\text{Total assets}_{i,k,t}} - \frac{1}{N_{k,t}} \sum_{j=1}^{N_{k,t}} \frac{\text{EBITDA}_{j,k,t}}{\text{Total assets}_{j,k,t}}.$$

$$\text{Risk-taking}_i = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left(E_{it} - \frac{1}{T} \sum_{t=1}^T E_{it} \right)^2}, t = 2018 \dots 2021$$

$$E_{it} = \frac{\text{EBITDA}_{i,t}}{\text{Total assets}_{i,t}} - \frac{1}{N_t} \sum_{j=1}^{N_t} \frac{\text{EBITDA}_{j,t}}{\text{Total assets}_{j,t}},$$

3.3.3 | Time horizon

Single indicator approaches do not capture the trade-offs between different elements of long-term orientation. Thus, following Kappes and Schmid (2013), we adopted a composite index, which

TABLE 3 Time horizon indicators.

Indicators	Measurement	Rationale
Mission investments category		
Capital expenditure	Tangible fixed assets/sales	Capital expenditure represents expenditure in an early period that typically does not pay off in the short term. High scores indicate an investment policy that is targeted at building up the firm's future operations and products.
People investments category		
Employee investment	% change in employees to sales between year t_{-1} and year t	High scores indicate an employee policy targeted towards attracting and retaining knowledge, increasing motivation, productivity, and loyalty
Employee salaries	% change in salary per employee between year t_{-1} and year t (using cost of employees)	
Employee downsizing	% change in employees between year t_{-1} and year t	
External stakeholder-related investments category		
Cash	Cash and cash equivalent/total assets	High scores indicate a financial policy that targets commitments to external stakeholders and meeting financial obligations that are not dependent on current cash flows.
Liquidity	Current assets/current liabilities	
Debt maturity	Long-term debt/(Long-term debt + current liabilities)	

Note: Adapted from Kappes and Schmid (2013).

incorporated the three core categories of long-term orientation identified by Le Breton-Miller and Miller (2006): mission-related investments, people-related investments, and external stakeholder-related investments. The indicators for each category are shown in Table 3.

To aggregate the above indicators into the time horizon composite variable, the benefit-of-the-doubt approach was used, as proposed by Cherchye et al. (2007). The approach utilises data envelopment analysis (DEA) to construct a composite indicator defined as the ratio of an observation's actual performance to its benchmark performance (the frontier) (Vissers et al., 2021). The following equations summarise the model:

$$\begin{aligned}
 CI_j &= \max \sum w_i y_{ij} \\
 \text{s.t. } \sum w_i y_{ij} &\leq 1 \quad \forall j = 1, \dots, n \\
 w_i &\geq 0 \quad \forall i = 1, \dots, s
 \end{aligned} \tag{4}$$

CI = composite indicator for firm j , w = weight for subindicator i , y = performance of firm on subindicator i , j = DMU/firm. The sub-indicators were defined such that “the higher the better” holds (higher scores-higher time horizon).

3.4 | Control variables

A series of control variables were included to control for firm characteristics on risk-taking, time horizon, and RRI. We included firm age, the number of years since incorporation until 2021 (Godos-Díez et al., 2011). We included firm size as the natural logarithm of total assets (Andries et al., 2020). Following previous research, we controlled for (lagged) profitability (ROA), (lagged) leverage (square root of total debt to total assets, to correct for skewness), found to be associated with risk-taking, time horizon, and ESG performance (Andries et al., 2020; Aksoy et al., 2020), and the share of tangible assets to total assets for time horizon (Kappes & Schmid, 2013). To control for firm growth, found to be positively associated with risk-taking and time horizon (John et al., 2008) and negatively associated with RRI (Asante-Appiah & Lambert, 2022), we measured the change in operating income in year t relative to year t_{-1} . We also include industry and region dummies.

3.5 | Data analysis

To test the mediation effect, we used a recursive system of equations following the four-step approach proposed by Baron and Kenny (1986):

Step 1: show that Y is significantly related to X (τ must be significant).

$$\begin{aligned}
 RRI_i &= \alpha + \tau_1 \times \text{Family ownership}_i + \tau_2 \\
 &\quad \times \text{Cooperative ownership}_i + \gamma_1 \times \text{Total assets}_i + \gamma_2 \\
 &\quad \times \text{Firm age}_i + \gamma_3 \times \text{Leverage } t_{-1i} + \gamma_4 \times \text{ROA } t_{-1i} + \gamma_5 \times \text{Growth}_i \\
 &\quad + \gamma_6 \times \text{Region}_i + \gamma_7 \times \text{Industry}_i + \epsilon_i.
 \end{aligned}$$

Step 2: show that M is significantly related to X (β must be significant).

$$\begin{aligned}
 \text{Risk-taking}_i &= \alpha + \beta_{a1} \times \text{Family ownership}_i + \beta_{a2} \\
 &\quad \times \text{Cooperative ownership}_i + \gamma_1 \times \text{Total assets}_i \\
 &\quad + \gamma_2 \times \text{Firm age}_i + \gamma_3 \times \text{Leverage } t_{-1i} + \gamma_4 \times \text{ROA } t_{-1i} \\
 &\quad + \gamma_5 \times \text{Growth}_i + \epsilon_i.
 \end{aligned}$$

$$\begin{aligned}
 \text{Time horizon}_i &= \alpha + \beta_{b1} \times \text{Family ownership}_i + \beta_{b2} \\
 &\quad \times \text{Cooperative ownership}_i + \gamma_1 \times \text{Total assets}_i \\
 &\quad + \gamma_2 \times \text{Firm age}_i + \gamma_3 \times \text{Leverage } t_{-1i} + \gamma_4 \times \text{ROA } t_{-1i} \\
 &\quad + \gamma_5 \times \text{Growth}_i + \gamma_6 \times \text{Tangible assets}_i + \epsilon_i.
 \end{aligned}$$

Step 3: show that M is significantly related to Y (δ must be significant).

$$RRI_i = \alpha + \delta_a \times \widehat{\text{Risk-taking}}_i + \gamma_1 \times \text{Region}_i + \gamma_2 \times \text{Industry}_i + \epsilon_i.$$

$$RRI_i = \alpha + \delta_b \times \widehat{\text{Time horizon}}_i + \gamma_1 \times \text{Region}_i + \gamma_2 \times \text{Industry}_i + \epsilon_i.$$

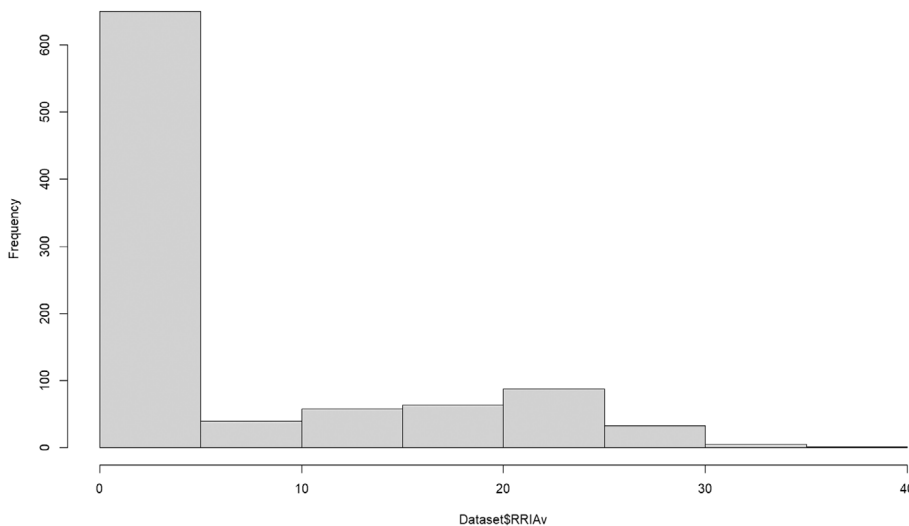


FIGURE 2 RepRisk index distribution.

Step 4: show that when Y is regressed on both X and M , M affects Y (δ must be significant and τ' should be smaller in absolute value than the original effect for the independent variable (τ)).

$$\begin{aligned} \text{RRI}_i = & \alpha + \tau'1 \times \text{Family ownership}_i + \tau'1 \\ & \times \text{Cooperative ownership}_i + \delta_a \times \widehat{\text{Risk-taking}}_i + \delta_b \\ & \times \widehat{\text{Time horizon}}_i + \gamma_1 \times \text{Region}_i + \gamma_2 \times \text{Industry}_i + \varepsilon_i. \end{aligned}$$

Two main models were used in our analysis. Our primary dependent variable (Y), RRI, in Steps 1, 3, and 4, is a censored variable ranging from 0 to 40. The distribution of RRI (Figure 2) is skewed and has a high probability mass near 0. The mediators, risk-taking and time horizon, which were the dependent variables in Step 2 of the analysis, also ranged from 0 to 1. When the dependent variable is censored and skewed, the assumptions of the ordinary least square (OLS) regression are violated. These violations can result in inconsistent estimators as the value of the dependent variable may fall beyond the possible range of our data (Amemiya, 1984). Therefore, we applied a censored (Tobit) regression model, as suggested by Tobin (1958) and previous literature (Jia et al., 2022). We also estimated a model, with RRR as our dependent variable in Steps 1, 3, and 4. As RRR is an ordinal variable (Figure 3), taking values from 1 to 10, we applied an ordinal regression, which accounts for the ordering of the category levels (Kambe & Tamamura, 2022; Zanin, 2022).

4 | RESULTS

Table 4 presents an overview of the descriptive statistics for our variables and their differentiation across the three ownership structures.

Based on the low mean RRI and the distribution of the variable in Figure 2, it appears that several companies in our sample are minimally exposed to ESG reputation risk. Notably, FFs display a higher average RRI and RRR than the other ownership structures and the overall sample, but also the highest mean value for the time horizon.

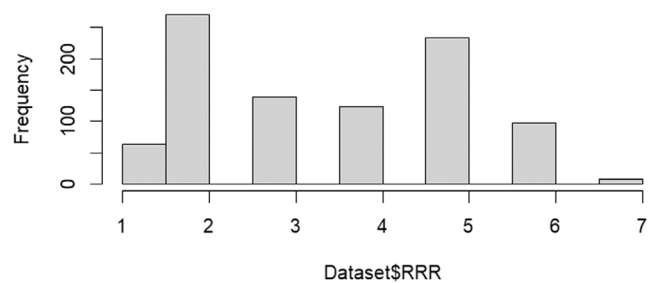


FIGURE 3 RepRisk rating distribution.

IOFs exhibit the highest average scores for risk-taking and growth, whereas cooperatives are larger in size and exhibit the highest mean leverage. The subsequent sections will present the Tobit model outcomes to further investigate the relationship between RRI and our independent variables.

4.1 | Tobit regression

Table 5 reports the results from the Tobit models using robust standard errors (SE). We computed the variance inflation factor (VIF) for all steps in order to assess the presence of multicollinearity. Appendix 2 displays the VIF results, indicating that all values are well below the commonly recommended threshold of 5; hence, multicollinearity is not a substantial concern in our analysis.

We start by examining the direct effect of ownership structure on the dependent variable, RRI, in Step 1. The coefficients for family ($\tau_1 = 7.08$, $p < 0.01$) and cooperative ownership ($\tau_2 = 5.51$, $p < 0.05$) are both positive and statistically significant (at 5%), indicating that compared with the reference category “IOF”, firms with a family or cooperative ownership exhibit a significantly higher ESG risk. Meanwhile, cooperatives display a non-significantly lower RRI in comparison to FFs. The results confirm hypotheses H1a and H1b. In Step 2, we regress the mediators on the independent variable. In Step 2a,

TABLE 4 Descriptive statistics.

	Family (N = 420)	IOF (N = 432)	Cooperative (N = 84)	Overall (N = 936)
RRI				
Mean (SD)	6.78 (9.87)	4.55 (8.34)	6.60 (9.00)	5.73 (9.17)
Median (Min, Max)	0 [0, 32.0]	0 [0, 38.7]	0 [0, 27.8]	0 [0, 38.7]
RRR				
Mean (SD)	4.04 (1.53)	3.09 (1.40)	2.93 (1.23)	3.50 (1.53)
Median (Min, Max)	4.81 [1.00, 6.33]	2.92 [1.00, 6.42]	2.67 [1.00, 6.83]	3.35 [1.00, 6.83]
Risk-taking				
Mean (SD)	0.04 (0.05)	0.05 (0.06)	0.04 (0.035)	0.04 (0.06)
Median (Min, Max)	0.03 [0.00, 0.85]	0.03 [0.00, 0.51]	0.03 [0.00, 0.18]	0.03 [0.00, 0.85]
Time horizon				
Mean (SD)	0.37 (0.20)	0.33 (0.25)	0.26 (0.22)	0.34 (0.23)
Median (Min, Max)	0.36 [0.00, 1.00]	0.27 [0.00, 1.00]	0.22 [0.01, 0.934]	0.32 [0.00, 1.00]
Total assets				
Mean (SD)	162,000 (523000)	403,000 (2520000)	465,000 (1330000)	300,000 (1800000)
Median (Min, Max)	43,000 [253, 7,060,000]	50,700 [810, 45,400,000]	77,300 [1780, 8,440,000]	48,900 [253, 45,400,000]
Firm age				
Mean (SD)	37.6 (25.2)	36.1 (25.3)	34.6 (23.5)	36.6 (25.1)
Median (Min, Max)	33.0 [3.00, 220]	32.0 [2.00, 168]	30.0 [4.00, 115]	33.0 [2.00, 220]
Leverage				
Mean (SD)	0.54 (0.27)	0.52 (0.23)	0.58 (0.23)	0.53 (0.25)
Median (Min, Max)	0.53 [0.05, 2.43]	0.501 [0.01, 1.59]	0.581 [0.04, 1.31]	0.52 [0.01, 2.43]
ROA				
Mean (SD)	0.09 (0.10)	0.09 (0.12)	0.073 (0.08)	0.089 (0.10)
Median (Min, Max)	0.08 [-0.52, 0.74]	0.09 [-0.59, 0.71]	0.0667 [-0.20, 0.40]	0.085 [-0.59, 0.74]
Tangible assets ratio				
Mean (SD)	0.31 (0.18)	0.34 (1.00)	0.35 (0.207)	0.33 (0.69)
Median (Min, Max)	0.30 [0, 1.22]	0.27 [-0.64, 20.7]	0.34 [0.00373, 1.69]	0.29 [-0.64, 20.7]
Growth				
Mean (SD)	0.108 (0.217)	0.268 (2.24)	0.0704 (0.357)	0.179 (1.54)
Median (Min, Max)	0.0719 [-0.513, 1.62]	0.0692 [-0.447, 43.3]	0.0256 [-0.591, 2.97]	0.0670 [-0.591, 43.3]

the coefficients for family ($\beta_{a1} = -0.01$, $p < 0.01$) and cooperative ownership ($\beta_{a2} = -0.01$, $p < 0.01$) are negative and statistically significant (at 5%), indicating that IOFs exhibit significantly higher risk-taking, in comparison to FFs and cooperatives, whereas cooperatives exhibit a nonsignificant lower risk-taking compared to FFs. The results are consistent with hypotheses H2a and H2b. In Step 2b, the statistically significant coefficients for family ($\beta_{a1} = 0.05$, $p < 0.01$) and cooperative ownership ($\beta_{a2} = -0.06$, $p < 0.05$) confirm hypotheses H3a and H3b, with FFs exhibiting a significantly longer time horizon, in comparison to IOFs and cooperatives, and cooperatives significantly exhibiting shorter time horizon compared with IOFs. In Step 3 we investigate the relationship between the dependent variable and mediators. Time horizon has a significantly positive ($\delta_a = 45.26$, $p < 0.05$) association with RRI, while the negative effect of risk-taking ($\delta_b = -67.16$, $p > 0.10$) is nonsignificant. Therefore, there is no

evidence to support hypothesis H2c. However, an increase in time horizon is associated with higher RRI values, contrary to the direction of the relationship proposed by hypothesis H3c. When both ownership structure and time horizon are included in Step 4, the ownership structure variables remain significant predictors of RRI ($t'_{1} = 4.50$, $p < 0.05$; $t'_{2} = 7.96$, $p < 0.01$), while time horizon has a nonsignificant effect ($\delta_a = 38.42$, $p > 0.10$). These results demonstrate no mediation and thus, we do not find any support for hypotheses H2d and H3d.

4.2 | Robustness tests

To examine the robustness of family ownership, we introduce an alternative measure that accounts for the presence of family members

TABLE 5 Tobit models (robust SE in parenthesis).^a

Dependent variable	RRI		Risk-taking		Time horizon	
	Step (1)	Step (2a)	Step (2b)	Step (3a)	Step (3b)	Step (4)
Constant	-26.35*** (7.49)	0.16*** (0.03)	0.28*** (0.07)	-7.47** (3.56)	-26.22*** (6.84)	-27.04*** (9.40)
Family ownership	7.08*** (1.65)	-0.01*** (0.004)	0.05*** (0.02)			4.50** (2.02)
Cooperative ownership	5.51** (2.66)	-0.01*** (0.004)	-0.06** (0.03)			7.96*** (3.05)
Fitted risk-taking				-67.16 (45.79)		
Fitted time horizon					45.26** (18.01)	38.42 (26.71)
Total assets	3.23*** (1.10)	-0.02*** (0.003)	-0.004 (0.01)			
Firm age	-2.89 (2.55)	-0.02** (0.01)	-0.01 (0.03)			
Leverage _{t-1}	-0.09 (4.69)	0.004 (0.01)	0.07 (0.05)			
ROA _{t-1}	7.20 (7.75)	-0.05 (0.05)	0.12 (0.09)			
Growth	-0.01 (0.57)	0.01*** (0.002)	0.07*** (0.01)			
Tangible assets ratio			0.02*** (0.005)			
Observations	936	936	936	936	936	936
Log likelihood	-1837.76	1485.96	55.11	-1848.92	-1847.65	-1842.07
Wald test	90.03*** (df = 18)	106.71*** (df = 7)	79.50*** (df = 8)	58.06*** (df = 13)	61.96*** (df = 13)	76.65*** (df = 15)

Note: Ownership reference category: IOF; Robust SE in parentheses.

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

^aThe models included control variables for both region and industry, but these variables have been excluded from the result tables for the sake of simplicity. The complete results can be found in the Data S1.

on the board and management team, in addition to the majority ownership (>50%). This provides a more accurate reflection of the level of influence the family has on firm decision-making. Additionally, it can be argued that FFs may opt to acquire majority ownership in specific companies due to their well-known longer corporate time horizons and strong performance. Thus, this measure also addresses reverse causality concerns by ensuring that the family owners are the original founders of the firm. The models included two family ownership measurements, one for the FFs that meet the additional requirement of the presence of family members on the board, and one for the rest of the FFs. We do this to test whether there are major disparities between the two types of FFs. The results of this test are presented in Appendix 3, and show there is no significant difference in the RRI between the two measurements of FFs. However, both family ownership measurements show a significantly higher RRI in comparison to IOFs and a nonsignificant higher RRI in comparison to cooperatives. In Step 2, we find once more that IOFs exhibit significantly higher risk-taking, while there is no significant distinction between both measures of FFs and cooperatives. Additionally, FFs have significantly longer time horizons and cooperatives exhibit significantly shorter time horizon in comparison to all other forms of ownership. There is also no significant difference in time horizons between the two measures of FFs. Steps 3 and 4 remain robust, with the mediators proving insignificant, whilst the ownership structure measures remain significant.

As robustness check for the risk-taking variable, we applied the same models but with a country and industry-adjusted dispersion of firm earnings. The results are presented in Appendix 4 and reveal no significant changes in comparison with our initial models. Our initial

results are robust to other risk measures that account for country and industry-level influences.

We also applied an ordinal regression with RRR as our dependent variable, which facilitates benchmarking of the firms against their company peer groups. The results for our independent variables (Table 6) are consistent with the results of the Tobit model. Regarding Step 3, the models show a significant negative relation of risk-taking with RRR and a positive one for time horizon. Nevertheless, the mediators remain insignificant in Step 4, while the direct effect of ownership remains significant.

4.3 | Sample selection bias

To address sample selection bias concerns arising from only including observations with RepRisk scores, we employ a two-step Heckman model on a sample of 18,966 European food manufacturing firms (the maximum possible sample size allowed to be extracted from ORBIS). In the first stage, a probit model is used to estimate the likelihood of a firm getting a RepRisk score. To determine the independent variables for this model, we examined earlier literature on the factors that affect firm's ESG visibility and media coverage. First, we include firm size, as larger firms have more visibility in the media (Bednar, 2012). We use the logarithm of total assets and sales lagged by 1 year. Second, on the one hand, more profitable and successful firms tend to receive greater media coverage (Lamin & Zaheer, 2012). Conversely, the media is predisposed towards publishing negative content on firms that have faced previous scrutiny (Core et al., 2008). Hence, we

TABLE 6 Ordinal regression with RRR as DV.

Dependent variable: RRR				
	Step (1)	Step (3)	Step (3)	Step (4)
Family ownership	0.87*** (0.14)			0.64*** (0.18)
Cooperative ownership	0.69*** (0.25)			0.82*** (0.28)
Fitted risk-taking		-7.40** (3.36)		-3.56 (3.18)
Fitted time horizon			4.81*** (1.57)	2.48 (2.40)
Total assets	0.23** (0.10)			
Firm age	-0.52** (0.22)			
Leverage _{t-1}	0.16 (0.40)			
ROA _{t-1}	0.11 (0.67)			
Intercepts				
1 2	-1.31** (0.65)	-2.59*** (0.30)	-0.57 (0.958)	-1.16 (0.84)
2 3	1.73*** (0.65)	0.37 (0.27)	2.40*** (0.58)	1.86** (0.83)
3 4	3.75*** (0.67)	2.36*** (0.31)	4.38*** (0.60)	3.87*** (0.85)
4 5	5.46*** (0.69)	4.04*** (0.34)	6.06*** (0.62)	5.57*** (0.87)
5 6	7.76*** (0.70)	6.25*** (0.36)	8.29*** (0.64)	7.85*** (0.87)
6 7	10.62*** (0.77)	9.08*** (0.50)	11.14*** (0.73)	10.72*** (0.94)
Observations	936	936	936	936
AIC	2219.284	2246.551	2243.212	2222.387

p* < 0.1; *p* < 0.05; ****p* < 0.01.

accounted for prior business performance by including a 1-year lagged return on assets (ROA). Third, the industry in which a firm operates can affect media coverage, as certain sectors have a greater global impact and therefore receive more coverage. Therefore, we have included dummy variables for the food sector (Dyck et al., 2008). The results from the first stage model allowed us to forecast the likelihood of RepRisk coverage for each company and estimate the inverse Mills ratio (IMR), a selection parameter that account for any biases that may arise from non-randomness (Certo et al., 2016). In the second step, a self-selection corrected Tobit model was estimated, wherein the IMR was integrated as an additional explanatory variable. The results are presented in Appendix 5. The second model indicates that our findings regarding ownership structure remain robust when accounting for potential sample selection bias. The inverse mill ratio is insignificant, indicating the absence of sample selection bias.

5 | DISCUSSION

The results confirm our hypothesis that ESG performance differs with respect to firm ownership structure. In line with previous research by Dal Maso et al. (2020) and Rees and Rodionova (2015), we found that FFs exhibit significantly lower ESG performance compared to IOFs and cooperatives. This could be attributed to their greater conservatism and resistance to change, as the family has a deep emotional commitment to tradition, the original business strategy, principles, and the preservation of the SEW (De Massis et al., 2021). The findings support the agency theory arguments. The strong control of the family allows them to direct corporate resources towards activities that

are beneficial to the preservation of the SEW and away from ESG initiatives that may jeopardise their control and influence over the firm, despite potential objections from minority stakeholders (Cruz et al., 2014). In contrast, IOFs are more flexible in adapting their business strategies to take advantage of new opportunities due to their profit-maximising objective and capital structure. IOFs also significantly outperform cooperatives in terms of ESG performance. These results are consistent with the arguments that property rights and agency characteristics create disincentives for cooperatives to invest additional equity capital and to decide in favour of ESG initiatives. Cooperatives make decisions democratically, centred on the interests of members (Kyriakopoulos, 1998). IOFs, on the other hand, have a different market-orientations and a uniform objective, making them more receptive and quick to integrate new ESG initiatives. IOFs have the advantage of greater flexibility in adapting in a fiercely competitive and rapidly changing market.

Additionally, our results support the argument that different ownership structures, with distinctive property rights, capital structures, and incentive mechanisms, exhibit varying risk-taking behaviour (Gursoy & Aydogan, 2002). In line with previous studies, our results provide empirical evidence for the arguments based on property rights and agency theory that cooperatives and FFs tend to adopt a more risk-averse approach when formulating strategies (Naldi et al., 2007; Van der Krogt et al., 2007). The lower risk-taking in FFs is driven by their goals of ownership succession and SEW preservation (Crocì et al., 2011), and the vulnerability they face given the significant undiversified family wealth tied to the firm (Gómez-Mejía et al., 2007; Naldi et al., 2007; Zellweger & Sieger, 2012). The results reveal that both the alternative FFs and original FFs measures exhibit lower risk-



taking than IOFs, but risk-taking does not significantly differ between the two types of FFs. This indicates that FFs exercise family influence and create an alignment between the risk preferences of managers and owners through other mechanisms besides representation on the board and management team. Cooperatives also tend to exhibit less risk-taking than IOFs due to their property rights, as the firms are financed primarily by their members equity. The low level of risk diversification and opportunity cost of investing the capital in their own operations, makes cooperative members reluctant to engage in risky new opportunities (Kyriakopoulos, 1998; Soboh et al., 2012).

Moreover, the results confirm the hypothesis that firm ownership influences the time horizon of the firm, with FFs having a significantly longer time horizon. The conclusions hold true for both alternative and original FFs measures, with no significant difference in time horizon between the two. Family ownership is positively related to time horizon due to trans-generational family considerations, the interest in the long-term survival, and reputation of the firm (Crocchi et al., 2011; Kappes & Schmid, 2013). Among the ownership structures investigated, cooperatives demonstrate the shortest time horizon, in line with the horizon problem outlined by the property rights theory. The collective property rights of cooperatives tie the firm's residual claims to their members' transactions with the firm. This leads to shorter time horizons as benefits from investments can only be gained during the period of membership rather than during the productive life of the assets (Kyriakopoulos, 1998).

Lastly, we find that there is a significant total effect of ownership on ESG risk, but we find no evidence of mediation by risk-taking and time horizon. Nevertheless, we find that, controlling for the effect of ownership on both mediators, time horizon has a significant positive association with RRI and RRR, while risk behaviour has a significant negative association with RRR. Thus, longer time horizons are negatively related to ESG performance, which differs from previous research (Graafland & Smid, 2013). This may be explained as firms with longer time horizons prioritise stability over risky investments and changes, the benefits of which may not materialise. In line with previous research, risk-taking has a beneficial effect on ESG performance by encouraging companies to seize opportunities in support of sustainability (Hossain et al., 2022; Wang & Poutziouris, 2010).

6 | CONCLUSION

Motivated by the limited and inconclusive evidence on the relationship between firm characteristics and ESG performance, this study aims to analyse whether and how firm ownership structure, risk-taking and time horizon are related to firms' ESG risk performance using cross-sectional data from European agri-food firms. Our results show that ESG performance differs depending on the firm's ownership structure, with IOFs outperforming the other ownership structures. Moreover, ownership structures also differ in terms of their time horizon and risk-taking behaviour, with family firms having a longer time horizon and IOFs having a higher risk-taking behaviour. Risk-taking and time horizon are also positively and negatively associated

with ESG performance, respectively, but they do not serve as mediators in the relationship between firm ownership and ESG performance.

We contribute to literature in two ways. The study extends prior research by incorporating ownership structure as a relevant variable with a direct and indirect effect on ESG performance. The findings indicate differences in the objectives and governance structure of cooperatives, FFs, and IOFs, which have implications for firm sustainability behaviour and performance. These outcomes are consistent with the arguments of property rights and agency theories, which suggest that ownership structure affects firm investment and decision-making incentives by defining the distribution of residual rights as well as the agency relations within the firm. Additionally, the study reveals that the previously overlooked firm characteristics of risk-taking and time horizon have implications for firm sustainability strategy and behaviour, and thus directly impact ESG performance.

6.1 | Implications

Our paper provides several implications. Managers need to be aware that in order to optimise firm internal governance, risk-taking, time horizon, and ESG performance, tailored solutions are required for different ownership structures based on their internal governance characteristics. Managers can utilise the long-term horizon in favour of ESG initiatives by raising awareness among employees and shareholders of the benefits of higher ESG performance on firm value and by incorporating ESG metrics into corporate performance measurement (Hoang, 2018). The evidence that higher risk-taking is related to better ESG performance suggests that a more proactive risk-taking culture and strategic orientation could be beneficial. Managers of FFs and cooperatives can promote the involvement of employees and members in strategic risk-taking by raising awareness of positive impact of risk-taking on value-enhancement, by fostering entrepreneurial risk-taking cultures (e.g., providing rewards, encouraging alternate views), and by establishing supportive opportunity recognition and risk management processes (IRM, 2012). The finding that the IOF model enhances sustainability performance—as a result of IOF objectives and structure—indicates that managers of other firms would benefit by redirecting their focus more towards the market's call for a more sustainability-oriented business strategy.

This study also provides implications for policymakers to design policies that regulate firm structure and behaviour to lead to higher levels of sustainability in society. Our results on time horizon indicate that it might be challenging to push FFs to pursue new ESG initiatives as it could put their long-term family objectives at risk. Policymakers could design policies for FFs which take into consideration principal-principal conflicts, and protect the interests of minority shareholders (Azoury & Bouri, 2015). This can be done by increasing the reporting requirements on ESG performance, ensuring that firm boards include independent directors and ESG experts, and promoting education programmes to shift firm behaviour towards sustainability. The findings indicate that FFs and cooperatives face a barrier to ESG initiatives

due to the high undiversified risk associated with the capital invested in the company. Additionally, they are less inclined to relinquish control by bringing in external investors. Thus, policymakers could devise precise fiscal mechanisms and targeted funding programmes to facilitate these firms' endeavours towards implementing specific sustainability initiatives. The positive association between the IOFs' objective and structure with sustainability performance also challenges policymakers to develop strategies which encourage a greater sustainability-oriented approach by FFs and cooperatives, for instance through taxation or subsidies to internalise the environmental and social externalities of firms (Pretty et al., 2001).

6.2 | Limitations

Although our findings provide valuable insights into the relationship between our main variables, it is important to acknowledge the limitations of this. First, RepRisk measures account for realised ESG performance reported in the media, which allows for an objective assessment of ESG performance, but only considers negative firm performance. Second, risk-taking and time horizon cannot be directly observed or measured. Our study employs a range of indicators to consider potential trade-offs between different elements of long-term orientation, and account for country-level influences and industry economic cycle on risk-taking behaviour. Third, we focus on European firms. Although the research can be generalised to other regions, care must be taken for countries where firms operate within distinct economic, institutional, and property rights systems. Moreover, this study employs cross-sectional data to investigate the hypothesised relationships and we acknowledge the limitations of this type of data.

6.3 | Future research

Our results also offer new avenues for academic research. We do not find evidence of mediation, suggesting that other mechanisms may be responsible for the effect of ownership on firm sustainability. Future research could explore in greater detail the ways in which ownership structure impacts organisational characteristics such as organisational culture and leadership. More detailed future studies are needed on how the involvement (or participation) of particular owners and stakeholders affects the firm's strategic decisions on sustainability (Mwambi et al., 2020). Additionally, our measurements of time horizon and risk behaviour are limited to publicly available data. Future research can replicate the study utilising more comprehensive indicators. Although risk-taking and time horizon are crucial components in the decision-making processes of firms, their impact on firm sustainability practises and performance has been vastly overlooked in current literature. Future research could investigate how different levels of risk-taking and time horizons benefit firm sustainability. Studies that incorporate ESG measures covering both positive (e.g., emission reductions) and negative outcomes, (e.g., ESG-related incidents) or each pillar of sustainability, would enhance our comprehension

further. Future research could include panel data and extend the analysis to other sectors.

DATA AVAILABILITY STATEMENT

All data used in this analysis were downloaded from the Orbis database (<https://orbis.bvdinfo.com>). Accessing this database requires a subscription. Instructions on accessing the data needed to replicate or extend this study and the code used for the analysis are available from the corresponding author upon reasonable request.

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REFERENCES

- Aksoy, M., Yilmaz, M. K., Tatoglu, E., & Basar, M. (2020). Antecedents of corporate sustainability performance in Turkey: The effects of ownership structure and board attributes on non-financial companies. *Journal of Cleaner Production*, 276, 124284.
- Amemiya, T. (1984). Tobit models: A survey. *Journal of Econometrics*, 24(1–2), 3–61.
- Anderson, R. C., & Reeb, D. M. (2003). Founding-family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance*, 58, 1301–1327.
- Andries, A. M., Balutel, D., Ilnatov, I., & Ursu, S. G. (2020). The nexus between corporate governance, risk taking, and growth. *PLoS one*, 15(2), e0228371.
- Arora, P., & Dharwadkar, R. (2011). Corporate governance and corporate social responsibility (CSR): The moderating roles of attainment discrepancy and organization slack. *Corporate Governance: An International Review*, 19(2), 136–152.
- Asante-Appiah, B., & Lambert, T. A. (2022). The role of the external auditor in managing environmental, social, and governance (ESG) reputation risk. *Review of Accounting Studies*, 28(1–3), 2589–2641.
- Azoury, N., & Bouri, E. (2015). Principal–principal conflicts in Lebanese unlisted family firms. *Journal of Management & Governance*, 19, 461–493.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Barry, T. A., Lepetit, L., & Tarazi, A. (2011). Ownership structure and risk in publicly held and privately owned banks. *Journal of Banking & Finance*, 35(5), 1327–1340.
- Bartholomeusz, S., & Tanewski, G. A. (2006). The relationship between family firms and corporate governance. *Journal of Small Business Management*, 44(2), 245–267.
- Barzel, Y. (1997). *Economic analysis of property rights*. Cambridge University Press.
- Becchetti, L., Cucinelli, D., Ielasi, F., & Rossolini, M. (2023). Corporate social irresponsibility: The relationship between ESG misconduct and the cost of equity. *International Review of Financial Analysis*, 89, 102833.
- Bednar, M. K. (2012). Watchdog or lapdog? A behavioral view of the media as a corporate governance mechanism. *Academy of Management Journal*, 55(1), 131–150.
- Bennedsen, M., Perez-Gonzalez, F., & Wolfenzon, D. (2010). The governance of family firms. In H. K. Baker & R. Anderson (Eds.), *Corporate governance: A synthesis of theory, research, and practice* (Vol. 8, pp. 371–389). John Wiley & Sons.
- Bingham, J. B., Dyer, W. G., Smith, I., & Adams, G. L. (2011). A stakeholder identity orientation approach to corporate social performance in family firms. *Journal of Business Ethics*, 99(4), 565–585.



- Borgen, S. O. (2004). Rethinking incentive problems in cooperative organizations. *Journal of Socio-Economics*, 33(4), 383–393.
- Boubakri, N., Mansi, S. A., & Saffar, W. (2013). Political institutions, connectedness, and corporate risk-taking. *Journal of International Business Studies*, 44, 195–215.
- Bushee, B. (2004). Identifying and attracting the 'right' investors: Evidence on the behaviour of institutional investors. *Journal of Applied Corporate Finance*, 26, 28–35.
- Certo, S. T., Busenbark, J. R., Woo, H. S., & Semadeni, M. (2016). Sample selection bias and Heckman models in strategic management research. *Strategic Management Journal*, 37(13), 2639–2657.
- Chaddad, F., & Iliopoulos, C. (2013). Control rights, governance, and the costs of ownership in agricultural cooperatives. *Agribusiness*, 29(1), 3–22.
- Chapple, L., Clarkson, P. M., & Gold, D. L. (2013). The cost of carbon: Capital market effects of the proposed emission trading scheme (ETS). *Abacus*, 49(1), 1–33.
- Cheng, M. M., Green, W. J., & Ko, J. C. W. (2015). The impact of strategic relevance and assurance of sustainability indicators on investors' decisions. *Auditing: A Journal of Practice & Theory*, 34(1), 131–162.
- Cherchye, L., Moesen, W., Rogge, N., & Puyenbroeck, T. V. (2007). An introduction to 'benefit of the doubt' composite indicators. *Social Indicators Research*, 82, 111–145.
- Chua, J. H., Chrisman, J. J., & Bergiel, E. B. (2009). An agency theoretic analysis of the professionalized family firm. *Entrepreneurship Theory and Practice*, 33, 355–372.
- Conca, L., Manta, F., Morrone, D., & Toma, P. (2021). The impact of direct environmental, social, and governance reporting: Empirical evidence in European-listed companies in the agri-food sector. *Business Strategy and the Environment*, 30(2), 1080–1093.
- Cook, M. L. (1995). The future of US agricultural cooperatives: A neo-institutional approach. *American Journal of Agricultural Economics*, 77(5), 1153–1159.
- Core, J. E., Guay, W., & Larcker, D. F. (2008). The power of the pen and executive compensation. *Journal of Financial Economics*, 88, 1–25.
- Croci, E., Doukas, J. A., & Gonenc, H. (2011). Family control and financing decisions. *European Financial Management*, 17(5), 860–897.
- Cruz, C., Larraza-Kintana, M., Garcés-Galdeano, L., & Berrone, P. (2014). Are family firms really more socially responsible? *Entrepreneurship Theory and Practice*, 38(6), 1295–1316.
- D'Amato, A., Festa, G., Dhir, A., & Rossi, M. (2021). Cooperatives' performance relative to investor-owned firms: A non-distorted approach for the wine sector. *British Food Journal*, 124(13), 35–52.
- Dal Maso, L., Basco, R., Bassetti, T., & Lattanzi, N. (2020). Family ownership and environmental performance: The mediation effect of human resource practices. *Business Strategy and the Environment*, 29(3), 1548–1562.
- Dangelico, R. M., Nastasi, A., & Pisa, S. (2019). A comparison of family and nonfamily small firms in their approach to green innovation: A study of Italian companies in the agri-food industry. *Business Strategy and the Environment*, 28(7), 1434–1448.
- Darnhofer, I., Fairweather, J., & Moller, H. (2010). Assessing a farm's sustainability: Insights from resilience thinking. *International Journal of Agricultural Sustainability*, 8(3), 186–198.
- De Massis, A., Eddleston, K. A., & Rovelli, P. (2021). Entrepreneurial by design: How organizational design affects family and non-family firms' opportunity exploitation. *Journal of Management Studies*, 58(1), 27–62.
- De Massis, A., Frattini, F., Pizzurno, E., & Cassia, L. (2015). Product innovation in family versus nonfamily firms: An exploratory analysis. *Journal of Small Business Management*, 53(1), 1–36.
- Dyck, A., Volchkova, N., & Zingales, L. (2008). The corporate governance role of the media: Evidence from Russia. *Journal of Finance*, 63(3), 1093–1135.
- Easterbrook, F. H., & Fischel, D. R. (1986). Close corporations and agency costs. *Stanford Law Review*, 38, 271–301.
- El Ghoul, S., Guedhami, O., Wang, H., & Kwok, C. C. (2016). Family control and corporate social responsibility. *Journal of Banking & Finance*, 73, 131–146.
- Engida, T. G., Rao, X., Berentsen, P. B., & Lansink, A. G. O. (2018). Measuring corporate sustainability performance—the case of European food and beverage companies. *Journal of Cleaner Production*, 195, 734–743.
- Faccio, M., Marchica, M. T., & Mura, R. (2011). Large shareholder diversification and corporate risk-taking. *The Review of Financial Studies*, 24(11), 3601–3641.
- Faccio, M., Marchica, M. T., & Mura, R. (2016). CEO gender, corporate risk-taking, and the efficiency of capital allocation. *Journal of corporate finance*, 39, 193–209.
- Faller, C. M., & zu Knyphausen-Aufseß, D. (2018). Does equity ownership matter for corporate social responsibility? A literature review of theories and recent empirical findings. *Journal of Business Ethics*, 150, 15–40.
- Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301–325.
- Fulton, M. (1995). The future of Canadian agricultural cooperatives: A property rights approach. *American Journal of Agricultural Economics*, 77(5), 1144–1152. <https://doi.org/10.2307/1243337>
- Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52(1), 106–137.
- Godos-Díez, J. L., Fernández-Gago, R., & Martínez-Campillo, A. (2011). How important are CEOs to CSR practices? An analysis of the mediating effect of the perceived role of ethics and social responsibility. *Journal of Business Ethics*, 98, 531–548.
- Graafland, J., & Smid, H. (2013). Competition, time horizon and corporate social performance: CentER discussion paper series. *SSRN Electronic Journal*, 2013–2060.
- Gursoy, G., & Aydogan, K. (2002). Equity ownership structure, risk-taking, and performance. *Emerging Markets Finance & Trade*, 38(6), 6–25. <https://doi.org/10.2307/27750315>
- Hansmann, H. (1988). Ownership of the firm. *Journal of Law, Economics, & Organization*, 4(2), 267–304.
- Hartmann, M. (2011). Corporate social responsibility in the food sector. *European Review of Agricultural Economics*, 38(3), 297–324.
- Hayati, D., Ranjbar, Z., Karami, E. (2010). Measuring agricultural sustainability. In E. Lichtfouse (Eds.), *Biodiversity, biofuels, agroforestry and conservation agriculture* (pp. 73–100). Springer.
- Hendrikse, G. W., & Veerman, C. P. (2001). Marketing cooperatives and financial structure: A transaction costs economics analysis. *Agricultural Economics*, 26(3), 205–216.
- Heyder, M., & Theuvsen, L. (2012). Determinants and effects of corporate social responsibility in German agribusiness: A PLS model. *Agribusiness*, 28(4), 400–420.
- Hoang, T. (2018). The role of the integrated reporting in raising awareness of environmental, social and corporate governance (ESG) performance. In *Stakeholders, governance and responsibility* (pp. 47–69). Emerald Publishing Limited.
- Hossain, A., Saadi, S., & Amin, A. S. (2022). Does CEO risk-aversion affect carbon emission? *Journal of Business Ethics*, 182(1), 1–28.
- Huang, D. Z. X. (2022). An integrated theory of the firm approach to environmental, social and governance performance. *Accounting & Finance*, 62, 1567–1598.
- IRM (Institute of Risk Management). (2012). *Risk culture: Resources for practitioners*. IRM.
- Jara-Bertin, M., López-Iturriaga, F. J., & López-de-Foronda, Ó. (2008). The contest to the control in European family firms: How other shareholders affect firm value. *Corporate Governance: An International Review*, 16(3), 146–159.
- Jensen, C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305–360.

- Jia, F., Li, Y., Cao, L., Hu, L., & Xu, B. (2022). Institutional shareholders and firm ESG performance: Evidence from China. *Sustainability*, 14(22), 14674.
- John, K., Litov, L., & Yeung, B. (2008). Corporate governance and risk-taking. *Journal of Finance*, 63(4), 1679–1728.
- Johnson, R. A., & Greening, D. W. (1999). The effects of corporate governance and institutional ownership types on corporate social performance. *Academy of Management Journal*, 42(5), 564–576.
- Joshi, S., Singh, R. K., & Sharma, M. (2023). Sustainable agri-food supply chain practices: Few empirical evidences from a developing economy. *Global Business Review*, 24(3), 451–474.
- Kambe, H., & Tamamura, M. (2022). Effects of firm-level ESG performance on creditworthiness in Japanese listed companies. *International Journal of Economic Policy Studies*, 16(2), 465–489.
- Kang, D. L., & Sørensen, A. B. (1999). Ownership organization and firm performance. *Annual Review of Sociology*, 25(1), 121–144.
- Kappes, I., & Schmid, T. (2013). The effect of family governance on corporate time horizons. *Corporate Governance: An International Review*, 21(6), 547–566.
- Katz, J. P. (1997). Managerial behavior and strategy choices in agribusiness cooperatives. *Agribusiness*, 13(5), 483–495.
- Kavadis, N., & Thomsen, S. (2023). Sustainable corporate governance: A review of research on long-term corporate ownership and sustainability. *Corporate Governance: An International Review*, 31(1), 198–226.
- Kim, J., & Mahoney, J. T. (2005). Property rights theory, transaction costs theory, and agency theory: An organizational economics approach to strategic management. *Managerial and Decision Economics*, 26(4), 223–242.
- Krasnozhon, L. O. (2011). Property rights and farm efficiency: Evidence from Ukraine. *Economic Change and Restructuring*, 44(4), 279–295.
- Kyriakopoulos, K. (1998). Agricultural cooperatives: Organizing for market-orientation. IAMA World Congress VIII: “Building Relationships to Feed the World: Firms, Chains, Blocs”. Uruguay, Punta Del Este.
- López-Bayón, S., González-Díaz, M., Solís-Rodríguez, V., & Fernández-Barcala, M. (2018). Governance decisions in the supply chain and quality performance: The synergistic effect of geographical indications and ownership structure. *International Journal of Production Economics*, 197, 1–12.
- Lamin, A., & Zaheer, S. (2012). Wall street vs. Main street: Firm strategies for defending legitimacy and their impact on different stakeholders. *Organization Science*, 23(1), 47–66.
- Lavin, J. F., & Montecinos-Pearce, A. A. (2021). ESG disclosure in an emerging market: An empirical analysis of the influence of board characteristics and ownership structure. *Sustainability*, 13(19), 10498.
- Le Breton-Miller, I., & Miller, D. (2006). Why do some family businesses out-compete? Governance, long-term orientations, and sustainable capability. *Entrepreneurship Theory and Practice*, 30(6), 731–746.
- Li, J., & Wu, D. (2020). Do corporate social responsibility engagements lead to real environmental, social, and governance impact? *Management Science*, 66(6), 2564–2588.
- Li, T.-T., Wang, K., Sueyoshi, T., & Wang, D. D. (2021). ESG: Research Progress and future prospects. *Sustainability*, 13(21), 11663.
- Liang, H., & Renneboog, L. (2018). Is corporate social responsibility an agency problem? In S. Boubaker, D. J. Cumming, & D. K. Nguyen (Eds.), *Research handbook of finance and sustainability* (pp. 54–71). Edward Elgar Publishing.
- Long, T. B., Looijen, A., & Blok, V. (2018). Critical success factors for the transition to business models for sustainability in the food and beverage industry in The Netherlands. *Journal of Cleaner Production*, 175, 82–95.
- Mínguez Vera, A., Martín Uguedo, J. F., & Arcas Lario, N. (2010). Agency and property rights theories in agricultural cooperatives: Evidence from Spain. *Spanish Journal of Agricultural Research*, 8(4), 908–924.
- Mayo, E. (2011). Co-operative performance. *Sustainability Accounting, Management and Policy Journal*, 2(1), 158–164.
- Memili, E., Fang, H. C., Koc, B., Yildirim-Öktem, Ö., & Sonmez, S. (2018). Sustainability practices of family firms: The interplay between family ownership and long-term orientation. *Journal of Sustainable Tourism*, 26(1), 9–28.
- Mullens, D. (2018). Entrepreneurial orientation and sustainability initiatives in family firms. *Journal of Global Responsibility*, 9(2), 160–178.
- Mwambi, M., Bijman, J., & Mshenga, P. (2020). Which type of producer organization is (more) inclusive? Dynamics of farmers' membership and participation in the decision-making process. *Annals of Public and Cooperative Economics*, 91(2), 213–236. <https://doi.org/10.1111/apce.12269>
- Naldi, L., Nordqvist, M., Sjöberg, K., & Wiklund, J. (2007). Entrepreneurial orientation, risk-taking, and performance in family firms. *Family Business Review*, 20(1), 33–47.
- Paligoro, T. (2010). Corporate risk taking and ownership structure (No. 2010-3). Bank of Canada Working Paper. <https://www.econstor.eu/bitstream/10419/53851/1/618958037.pdf>
- Pennerstorfer, D., & Weiss, C. R. (2013). Product quality in the agri-food chain: Do cooperatives offer high-quality wine? *European Review of Agricultural Economics*, 40(1), 143–162.
- Pranawaningsih, R. R. Y. A., & Anas, E. P. (2021). Analysis of the effect of agency problems on sustainability practices of public companies in Indonesia. *Proceedings of the 1st international conference on sustainable management and innovation, ICoSMI 2020*, Bogor, West Java, Indonesia.
- Prause, G., & Hoffmann, T. (2017). Cooperative business structures for green transport corridors. *TalTech journal of European studies* 7(2), 3–27.
- Pretty, J., Brett, C., Gee, D., Hine, R., Mason, C., Morison, J., ... Dobbs, T. (2001). Policy challenges and priorities for internalizing the externalities of modern agriculture. *Journal of Environmental Planning and Management*, 44(2), 263–283.
- Rees, W., & Rodionova, T. (2013). What type of controlling investors impact on which elements of corporate social responsibility? *Journal of Sustainable Finance & Investment*, 3(3), 238–263.
- Rees, W., & Rodionova, T. (2015). The influence of family ownership on corporate social responsibility: An international analysis of publicly listed companies. *Corporate Governance: An International Review*, 23(3), 184–202.
- RepRisk (n.d.). RepRisk methodology overview. <https://www.reprisk.com/news-research/resources/methodology>
- Rubino, F., & Napoli, F. (2020). What impact does corporate governance have on corporate environmental performances? An empirical study of Italian listed firms. *Sustainability*, 12(14), 5742.
- Schulze, W. S., Lubatkin, M. H., & Dino, R. N. (2002). Altruism, agency, and the competitiveness of family firms. *Managerial and Decision Economics*, 23(4–5), 247–259.
- Slawinski, N., & Bansal, P. (2012). A matter of time: The temporal perspectives of organizational responses to climate change. *Organization Studies*, 33(11), 1537–1563.
- Soboh, R., Oude Lansink, A., & Van Dijk, G. (2012). Efficiency of cooperatives and investor owned firms revisited. *Journal of Agricultural Economics*, 63(1), 142–157.
- Srinivasan, R., & Phansalkar, S. J. (2003). Residual claims in Co-operatives: Design issues. *Annals of Public and Cooperative Economics*, 74(3), 365–396.
- Starks, L. T., Venkat, P., & Zhu, Q. (2017). Corporate ESG profiles and investor horizons (Working paper). SSRN Electronic Journal. Available at SSRN: <https://ssrn.com/abstract=3049943>
- Stein, J. C. (1989). Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *The quarterly journal of economics*, 104(4), 655–669.
- Tan, A. M., & Ann, H. J. (2023). Exploring the role of the theory of planned behaviour, risk orientation, and participative leadership in SME managers' engagement in CSR. *Revista Brasileira de Gestão de Negócios*, 25, 234–252.



- Terreros, I. S., & Górriz, C. G. (2011). The effect of organizational form and vertical integration on efficiency: An empirical comparison between cooperatives and investor owned firms. *African Journal of Business Management*, 5(1), 168.
- Tetrault Sirsly, C. A., & Sur, S. (2013). Strategies for sustainability initiatives: Why ownership matters. *Corporate Governance*, 13(5), 541–550.
- Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, 26(1), 24–36.
- Toma, P., Miglietta, P. P., Zurlini, G., Valente, D., & Petrosillo, I. (2017). A non-parametric bootstrap-data envelopment analysis approach for environmental policy planning and management of agricultural efficiency in EU countries. *Ecological Indicators*, 83, 132–143.
- Van der Krogt, D., Nilsson, J., & Høst, V. (2007). The impact of cooperatives' risk aversion and equity capital constraints on their inter-firm consolidation and collaboration strategies—With an empirical study of the European dairy industry. *Agribusiness: An International Journal*, 23(4), 453–472.
- Vissers, L. S., Lansink, A. G. O., & Saatkamp, H. W. (2021). Exploring the performance of system changes in Dutch broiler production to balance animal welfare, ammonia emissions and particulate matter emissions with farm profitability. *Agricultural Systems*, 193, 103217.
- Wang, Y., & Poutziouris, P. (2010). Entrepreneurial risk-taking: Empirical evidence from UK family firms. *International Journal of Entrepreneurial Behavior & Research*, 16(5), 370–388.
- Westhoek, H., Ingram, J., Van Berkum, S., Özay, L., & Hajer, M. (2016). Food systems and natural resources. A report of the working group on food systems of the international resource panel. United Nations Environment Programme.
- Wu, S., Li, X., Du, X., & Li, Z. (2022). The impact of ESG performance on firm value: The moderating role of ownership structure. *Sustainability*, 14(21), 14507.
- Zanin, L. (2022). Estimating the effects of ESG scores on corporate credit ratings using multivariate ordinal logit regression. *Empirical Economics*, 62(6), 3087–3118.
- Zellweger, T., & Sieger, P. (2012). Entrepreneurial orientation in long-lived family firms. *Small Business Economics*, 38, 67–84.
- Zhou, J.-H., Li, K., & Liang, Q. (2015). Food safety controls in different governance structures in China's vegetable and fruit industry. *Journal of Integrative Agriculture*, 14(11), 2189–2202.
- Baker, H. K., & Anderson, R. (Eds.). (2010). *Corporate governance: A synthesis of theory, research, and practice* (Vol. 8). John Wiley & Sons.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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APPENDIX 1: Theoretical arguments

	Property rights theory	Agency theory	ESG implications from property rights theory	ESG implications from agency theory
Cooperatives	<p>Not clearly defined property rights: due to members' multiple roles in the cooperative. This allocation gives rise to free rider behaviour.</p> <p>Non-transferability of property rights: members are unable to obtain an investment portfolio that accurately reflects their risk preferences, leading to risk aversion.</p> <p>The horizon of residual claims unlimited rights in net cash flows only over the time of membership/use, giving rise to the horizon problem.</p>	<p>Members heterogeneous objectives create collective decision-making costs, challenges in establishing effective incentives and control mechanisms that mitigate conflicts between members and managers.</p>	<p>Free rider, risk aversion, and time horizon problems create low incentives for members to invest in ESG.</p>	<p>Diversity of member objectives, conflicts between members and managers, and reluctance to exercise control create problems for the implementation of an ESG-oriented strategy and lead to lower ESG performance.</p>
FFs	<p>Clearly defined property rights: concentrated in the hands of family members.</p> <p>Limited transferability of property rights: family invests personal wealth with no or only limited diversification, leading to risk aversion.</p> <p>The horizon of residual claims: unlimited rights in net cash flows for the life of the organisation.</p>	<p>Family ownership mitigates principal-agent problems. However, it introduces unique principal-principal problems: Family members allocate firm resources towards family goals, disregarding the interests of minor shareholders.</p>	<p>FFs become risk averse to ESG initiatives, due to the comparatively larger amount of personal wealth invested in the firm and risks they have to carry, resulting in lower ESG investment incentives.</p>	<p>The strong control of the family allows them to use firm resources towards their interests, harming ESG performance as decision-making is targeted towards family goals of SEW protection, family control, and insulation from financial risks.</p>
IOFs	<p>Clearly defined property rights: distributed to owners in proportion to their investment.</p> <p>Full transferability of property rights: the tradability nature of residual claims enables the efficient allocation of risk.</p> <p>The horizon of residual claims: unlimited rights in net cash flows for the length of the ownership.</p>	<p>Owners share the goal of maximising the firm's market value. Moreover, stock market signals for evaluating management performance function as a control mechanism on behalf of shareholders.</p>	<p>The well-defined property rights, and efficient allocation of risk enable the design of the right incentives for investment in ESG.</p>	<p>The clear homogeneous goal, and external and internal control mechanisms, aid in evaluating management performance and ensure effective decision-making towards ESG initiatives.</p>



APPENDIX 2: VIF scores

Dependent variable	RRI	Risk-taking	Time horizon	RRI		
	Step (1)	Step (2)	Step (2)	Step (3)	Step (3)	Step (4)
Family	1.27	1.67	1.22			1.89
Cooperative	1.38	1.41	1.16			1.77
Fitted risk-taking				1.05		
Fitted time horizon					1.06	2.37
Total assets	1.17	2.06	1.15			
Firm age	1.15	2.23	1.16			
Leverage _{t-1}	1.19	1.69	1.10			
ROA _{t-1}	1.15	2.26	1.15			
Growth		1.03	1.08			
Tangible assets ratio			1.04			
Region	1.06			1.03	1.03	1.05
Industry	1.02			1.01	1.01	1.02

APPENDIX 3: Robustness check: Tobit models for alternative measures of family ownership

Dependent variable	RRI	Risk-taking	Time horizon	RRI		
	Step (1)	Step (2)	Step (2)	Step (3)	Step (3)	Step (4)
Constant	-26.59*** (7.50)	0.16*** (0.03)	0.31*** (0.07)	-7.55** (3.50)	-22.34*** (7.25)	-20.97* (11.07)
Robust family	6.17*** (2.00)	-0.01*** (0.004)	0.06*** (0.02)			4.38* (2.65)
Normal family	8.07*** (1.99)	-0.01* (0.005)	0.03 (0.02)			6.40*** (2.26)
Cooperative ownership	5.51** (2.65)	-0.01*** (0.004)	-0.06** (0.03)			7.01** (3.17)
Fitted risk-taking				-65.55 (45.04)		
Fitted time horizon					33.82* (19.37)	20.23 (32.11)
Total assets	3.29*** (1.11)	-0.02*** (0.003)	-0.01 (0.01)			
Firm age	-2.78 (2.56)	0.02** (0.01)	-0.01 (0.03)			
Leverage _{t-1}	-0.25 (4.69)	0.004 (0.01)	0.06 (0.05)			
ROA _{t-1}	6.84 (7.72)	-0.05 (0.05)	0.12 (0.09)			
Growth		0.01*** (0.002)	0.07*** (0.01)			
Region nordic	8.22*** (2.54)			7.12** (2.52)	6.53*** (2.53)	7.82*** (2.57)
Region southeastern	0.52 (1.86)			0.88 (1.83)	-0.03 (1.85)	0.20 (1.89)
Region northwest	-1.24 (2.64)			-2.91 (2.62)	-2.98 (2.63)	-1.19 (2.67)
Industry other food	4.62* (2.71)			4.59* (2.71)	4.74* (2.69)	5.09* (2.71)
Industry fish	9.91** (4.85)			8.95* (4.88)	9.00* (4.79)	9.50** (4.74)
Industry oil/fats	0.12 (4.37)			-0.62 (4.36)	-0.45 (4.30)	0.22 (4.35)
Industry meat/poultry	11.28*** (2.71)			11.29*** (2.75)	11.79*** (2.73)	11.27*** (2.72)
Industry animal food	-2.04 (4.64)			-3.09 (4.72)	-2.47 (4.72)	-2.32 (4.63)
Industry starches	-4.62 (4.77)			-4.85 (4.79)	-3.87 (4.76)	-4.36 (4.72)
Industry industrial	5.21 (4.22)			6.07 (4.36)	6.76 (4.42)	5.85 (4.26)
Industry bakery	2.58 (3.22)			2.05 (3.24)	2.32 (3.21)	2.75 (3.20)
Industry dairy	5.15* (3.04)			6.30** (3.04)	7.25** (3.03)	5.65* (3.07)
Observations	936	936	936	936	936	936
Log likelihood	-1837	1486	54	-1849	-1849	-1843
Wald test	91.36*** (df = 19)	110.46*** (df = 8)	63.70*** (df = 8)	57.96*** (df = 13)	57.50*** (df = 13)	75.57*** (df = 16)

*p < 0.1; ** p < 0.05; ***p < 0.01.



APPENDIX 4: Robustness check: Tobit models for alternative measures of risk-taking

Dependent variable	Industry adj. risk-taking	Country adj. risk-taking	RRI	
	Step (2)	Step (2)	Step (3)	Step (3)
Constant	0.16*** (0.02)	0.16*** (0.02)	-7.48** (3.57)	-7.24** (3.58)
Family ownership	-0.01*** (0.003)	-0.01*** (0.003)		
Cooperative ownership	-0.01*** (0.004)	-0.01*** (0.004)		
Fitted industry adj. risk-taking			-68.18 (46.89)	
Fitted country adj. risk-taking				-71.93 (46.60)
Total assets	-0.02*** (0.003)	-0.02*** (0.003)		
Firm age	-0.02** (0.01)	-0.03*** (0.01)		
Leverage _{t-1}	0.02 (0.01)	0.01 (0.01)		
ROA _{t-1}	-0.05 (0.04)	-0.05 (0.04)		
Growth	0.01*** (0.002)	0.01*** (0.002)		
Region nordic			7.13*** (2.52)	7.17*** (2.52)
Region southeastern			0.91 (1.83)	0.91 (1.83)
Region northwest			-2.92 (2.62)	-2.92 (2.62)
Industry other food			4.58* (2.71)	4.57* (2.71)
Industry fish			8.94* (4.88)	8.96* (4.89)
Industry oil/fats			-0.66 (4.36)	-0.66 (4.37)
Industry meat/poultry			11.27*** (2.75)	11.27*** (2.75)
Industry animal food			-3.11 (4.72)	-3.11 (4.72)
Industry starches			-4.86 (4.80)	-4.91 (4.80)
Industry industrial			6.04 (4.35)	6.03 (4.35)
Industry bakery			2.04 (3.24)	2.04 (3.24)
Industry dairy			6.28** (3.05)	6.25** (3.05)
Observations	936	936	936	936
Log likelihood	1508.76	1500.71	-1848.94	-1848.78
Wald test	101.43*** (df = 7)	99.20*** (df = 7)	58.00*** (df = 13)	58.43*** (df = 13)

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.



APPENDIX 5: Heckman model. The parameters estimated by Heckman two-step estimation procedure

Probit selection equation	
(Intercept)	-6.24 (0.14)***
Sales _{t-1}	0.24 (0.03)***
Total assets _{t-1}	0.28 (0.03)***
ROA _{t-1}	-0.007 (0.002)***
Industry other food	0.16 (0.07)**
Industry dairy	-0.12 (0.08)
Industry meat/poultry	-0.20 (0.07)***
Industry animal food	-0.28 (0.10)***
Industry oil/fats	-0.12 (0.11)
Industry starches	-0.20 (0.11)*
Industry fruits/vegetables	0.02 (0.08)
Industry fish	-0.15 (0.12)
Industry industrial	-0.39 (0.13)***
Outcome equation	
(Intercept)	-41.65 (9.66)***
Family	2.34 (0.65)***
Cooperative	2.48 (1.16)**
Total assets	7.32 (1.48)***
Firm age	-0.91 (1.00)
Leverage	2.09 (1.78)
Region nordic	2.82 (1.02)***
Region north west	-0.44 (0.99)
Region central western/eastern	0.32 (0.78)
Industry other food	1.11 (1.11)
Industry dairy	-0.51 (1.31)
Industry meat/poultry	2.33 (1.21)*
Industry animal food	-2.35 (1.65)
Industry oil/fats	-2.31 (1.73)
Industry starches	-2.65 (1.74)
Industry fruits/vegetables	-1.13 (1.26)
Industry fish	2.43 (1.90)
Industry industrial	-2.12 (2.07)
invMillsRatio	8.19 (1.71)***
Multiple R ²	0.0844
Adjusted R ²	0.0661
Observations	18966

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.