

The relationship of firm ownership structure and sustainability performance in agri-food chains: A systematic literature review

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ABSTRACT

Sustainability challenges have led to a growing interest in agri-food sustainability performance and the role of ownership structures in it. Ownership has significant implications by defining how owners reflect their goals and ownership costs into firm objectives, decision time horizons, risk preferences, and interactions with supply chain partners. Current literature shows conflicting results on the relationship and a lack of consistent definitions and measurements. Previous reviews have focused on one ownership structure, one sustainability pillar, have not addressed theory application or the context of the agri-food sector. This paper addresses this fragmented literature by providing a systematic assessment of conceptualisations and measures, theories used, linking empirical evidence and theoretical arguments to understand how ownership explains differences in sustainability performance. A systematically rigorous PRISMA methodology utilising thematic and narrative synthesis is applied. The synthesis reveals that ownership can positively affect one area of sustainability but negatively affect another. Theories explain how ownership shapes unique firm characteristics that, in turn influence sustainability performance. Firm goals, capital structure, governance system, and business strategy are significant explanatory factors for sustainability performance. The paper concludes with suggestions for future research to aid comparison between studies and generalisation of conclusions.

1. Introduction

Our world is facing a rapidly rising global population which has led to increasing demand for food (Ahorsu et al., 2018), while our footprint has already surpassed the environmental limits within which humanity can safely operate (FAO, 2014). Firms are increasingly forced to place greater emphasis on their long-term sustainability impacts. Previous studies suggest that the firms' ownership structure and decision-making are critical factors in determining the extent to which companies succeed in reducing their sustainability impacts (Aguilera et al., 2021). Over the past decade, academics have demonstrated a growing interest in how ownership can address this global challenge (Walls and Berrone, 2017). This focus is necessary because initiatives to improve sustainability performance require substantial financial commitments and resources in the short term, with results materialising in the long term;

internal strategic alignment of operations and decision-making with sustainability criteria; and intensive multi-level coordination between value chain actors (Aguilera et al., 2021). The firm's ownership structure is also often intrinsically linked to its organisational and sustainability goals, company's access to capital, distribution of decision-making power, i.e. the extent to which owners can translate their personal objectives into corporate strategies, investment time horizons, and its risk assessment and mitigation criteria (Bushee, 2004; Tetrault Sirsly and Sur, 2013).

Understanding the relationship between firm ownership structure and sustainability performance is crucial for improving sustainability outcomes in the agri-food sector. Despite significant advances in the literature, the mechanisms through which firm ownership structure influences sustainability outcomes in agri-food chains are not well understood. Several studies have assessed the sustainability performance

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of different forms of ownership, individually and in comparison to each other (e.g., [Battilana and Dorado, 2010](#)). However, the existing literature shows conflicting results. Moreover, previous studies have adopted different theoretical explanations that point in different directions as to how ownership structures can directly and indirectly affect sustainability performance. In general, the literature shows that ownership structures are driven by different objectives, resulting in different ways of balancing the needs of society and other stakeholders. However, different theoretical arguments point in different directions. The heterogeneity of the literature poses a challenge to understanding and generalising the findings. To address this issue, this paper carries out a systematic literature review in order to answer the research question: 'How does firm ownership structure influence sustainability outcomes in agri-food chains?' considering the three dimensions of sustainability (i. e., environmental, social, and economic).

This paper focuses on the ownership structure and sustainability performance of agri-food firms, but also considers sustainability performance at the farm level (e.g., where firms have contractual relationships with farms). The agri-food sector is the subject of this study for multiple reasons. Firstly, the sector plays a pivotal role in addressing global sustainability challenges, with its significant economic impact as the largest employer in the world ([FAO, 2015](#)) and its important implications for social and environmental sustainability ([Golini et al., 2017](#)). Secondly, the agri-food sector is subject to specific standards and regulations on quality and safety, and it has unique characteristics such as perishability and seasonality ([Mehmood et al., 2021](#)). By focusing exclusively on the agri-food domain, it is possible to provide more targeted insights. Thirdly, the agri-food sector is characterised by the prevalence of certain ownership structures, such as cooperatives, which are important entities for improving the financial position of farmers, reducing transaction costs between farmers and buyers, and ensuring quality control in the supply chain ([Bijman and Iliopoulos, 2014](#)). In contrast to previous research that has focused on managerial, foreign or concentration of ownership, this paper focuses on the categorisation of ownership in terms of the identity of the main shareholder. The identity of the owner has a significant impact on the sustainability performance of a company. The owner's goals and ownership costs are infused into the company's strategy, objectives, decision time horizons, and interactions with supply chain partners, which in turn drive sustainability initiatives ([Thomsen and Pedersen, 2000](#); [Connelly et al., 2010](#)).

Previous literature reviews on the relation between ownership and sustainability performance have first, mostly focused on one form of ownership structure or one pillar of sustainability performance. For example, [Balasubramanian et al. \(2021\)](#) review the impact of firm characteristics, firm ownership being one of them (distinguishing between domestic and foreign firms), on environmental sustainability. [Broccardo et al. \(2019\)](#) and [de las Heras-Rosas and Herrera \(2020\)](#) review the sustainability approach of family firms, while [Marcis et al. \(2019\)](#) focus on the sustainability performance of agricultural cooperatives. Second, most reviews have not assessed the relationships in the agri-food sector ([Gillan et al., 2021](#)). Third, theoretical frameworks have received little attention, however, a full understanding of the theoretical arguments for the existence of the relationship is essential for the interpretation of the findings. Fourth, most reviews have used non-systematic review methods. A systematic approach is essential to reduce selection and confirmation bias. Last, it remains unclear how the inconsistent definitions and measures of ownership and sustainability performance on the topic affect the results. Previous reviews that have synthesised the different conceptualisations and measures of sustainability performance have not linked them to ownership structures ([Latruffe et al., 2016](#)). While all of these reviews provide valuable information and insights, focusing on specific sustainability pillars, ownership types, conceptualisations and metrics separately results in the literature remaining unintegrated.

Our paper makes several contributions to the existing literature. First, we provide a comprehensive review of the current

conceptualisations and measures of the main variables to identify trends and trace back potential conflicts in the findings. Second, we provide a systematic assessment of the main theories that have been used to explain the relationship between ownership and sustainability. Third, we provide a synthesis of the main characteristics of each type of ownership structure and how they differ from each other. Fourth, we link together the currently fragmented empirical evidence to understand how the identified differences between firm ownership structures provide explanations for differences in the sustainability performance of agri-food chains. Finally, we apply a systematically rigorous methodology following the PRISMA guidelines. By answering the research question, this paper brings more clarity on how specific types of ownership models can influence the achievement of sustainability goals. The findings also contribute to the broader literature on corporate governance and sustainability by providing a link between the unique characteristics and governance mechanisms of different ownership structures and sustainability outcomes depending on the sustainability pillar, paving the way for future research.

The following section provides an explanation of the methodology used. The analysis and results of the research are then presented, followed by the discussion, limitations, and implications for future studies.

2. Methodology

This paper employs a systematic literature review (SLR) methodology which differentiates from other reviews by employing "systematic and explicit techniques to locate, select, critically appraise relevant research, ... gather and analyze data from the studies included in the review" ([Moher et al. 2009, p. 264](#)). SLR is established as a legitimate technique to efficiently map the main relevant theoretical perspectives in literature ([Touboulic and Walker, 2015](#); [Dania et al., 2018](#)), while offering the advantage of reducing and exposing any researcher bias that could occur ([Petticrew and Roberts, 2006](#); [Candel, 2014](#)). This paper follows the PRISMA guidelines, to ensure the transparency, accountability, and quality of our review ([Moher et al., 2009](#); [Wijewickrama, et al., 2021](#)). An overview of the review process can be found in [Appendix A](#). The following sections provide in-depth information for each step of the review.

2.1. Eligibility criteria

Because of the cross-disciplinary character of the topic, the literature search included publications within the scope of business, management, economics, and agriculture ([Tranfield et al., 2003](#)). The review was restricted to papers published between 1990 and April 2022 (the completion of the screening process). The starting point was based on the fact that the first article presenting a combination of the keywords ownership, structure, and performance appeared in 1990 ([Smith, 1990](#); [El Kouiri et al., 2021](#)), and appropriate indicators for agricultural sustainability trace back to 1991 ([Organization for Economic Co-operation and Development \(OECD\) \(1991\)](#); [Hayati et al., 2010](#)). Only peer-reviewed journal publications and book chapters were included due to their rigorous review process ([Miller and Serzan, 1984](#)), and the latter because we also focus on the theoretical underpinnings in literature. Predominantly in the social sciences, book chapters may cover material not published in journals ([Petticrew and Roberts, 2006](#)).

2.2. Information sources

The review process started in March 2022 and ended in November 2022. Both Scopus and Web of Science (WoS) provide a comprehensive coverage of the social sciences. Scopus contains a total of 43,400 titles, 95 % of which are peer-reviewed journals from over 7,000 publishers worldwide, covering a wide range of relevant disciplines including business, management, agriculture, and economics (Scopus, 2023). Research has shown that Scopus is able to discover 93 % of the citations

discovered by WoS and provides approximately 20 % more coverage and a wider range of journals (Martín-Martín et al., 2018; Adriaanse and Rensleigh, 2013). Before making the decision, we carried out the screening process in both Scopus and WoS. Scopus was able to identify a significantly larger number of relevant publications (10,287 versus 4,220). In addition, most of the results identified by WoS were already identified by Scopus. As Scopus offered an extensive number of relevant results and coverage for our sample of interest, we proceeded with Scopus (Norris and Oppenheim, 2007).

2.3. Search strategy

Prior to designing the search string, an initial screening of the literature was conducted to identify relevant keywords (Tranfield et al., 2003; Candel, 2014) (Appendix B). In addition to ownership structure and sustainability, the terms corporate social responsibility (CSR) and governance were widely used in the relevant literature and were consequently included in the search string. The terms investor, family and cooperative were included to further capture the concept of ownership structure. The screening process revealed that studies on these ownership structures tended to use the type of firm directly in their titles and abstracts rather than the term 'ownership'. 'Eco' was included to capture both research on economic performance and concepts such as 'eco-social' sustainability. Restrictions on publication date, document type, and subject area were set during the abstract and title screening. The eligibility criteria were then applied to ensure that only relevant papers were included in the full-text screening.

2.4. Data collection and selection process

The first step was to identify and search generically for publications dealing with any of the issues to be addressed in this paper. After analysing the abstracts, publications were eliminated if they were not relevant to the search criteria.

The eligibility criteria were manually checked by the corresponding author and double-checked by a second author. To deal with the large number of results, a machine learning application, Rayyan (<https://www.rayyan.ai/>), was used to semi-automate the screening process and assist in the selection of relevant papers (see supplementary material). Rayyan is trained by the user's selections to include or exclude publications. By learning the characteristics of the excluded and included publications, Rayyan builds a classification model according to these characteristics, which generates a score indicating how closely each unprocessed publication matches the inclusion and exclusion classes (Ouzzani et al., 2016). Rayyan is a widely used tool for SLR support and was found to have the highest score in terms of performance, scope and functionality compared to other SLR support tools (Harrison et al., 2020).

Most publications that did not pass the abstract screening process were excluded due to their focus on topics outside the scope of this research, such as biotechnology, veterinary or health sciences research. As a result, a final number of 207 publications were identified and included in the next stage of the full paper screening process. After full-text screening and quality assessment the documents were prepared for synthesis.

2.5. Quality assessment

An important part of the SLR is the publications' quality assessment. In most reviews, this step includes an assessment of the publications' methods, analysis and risk of error (Tranfield et al., 2003; Petticrew and Roberts, 2006). This paper is interested in the theoretical models used and the conclusions drawn on the relationship between ownership and sustainability performance. Therefore, the quality assessment focused on the evaluation of the authors' arguments, the presence of justification, the construction of the theoretical framework and the application.

Since both theoretical and empirical publications were included, two different evaluation checklists were created (Appendix C). For theoretical publications, previous reviews have applied an inductive approach by researchers rather than standardised checklists (Campbell et al., 2014). Therefore, we compiled a checklist based on existing measures from literature for interpretability, transparency, coherence, and theoretical framework. For empirical publications, criteria from existing evaluation checklists for qualitative publications were used, as these checklists focus on transparency, fitness for purpose or context, and general assessment of the methodology used.

2.6. Synthesis methods

We used a combination of narrative and thematic synthesis to identify similarities and potential differences between studies arising from heterogeneity in conceptualisation and operationalisation. Narrative synthesis, widely applied in similar studies (Rousseau et al. 2008; Saz-Gil et al., 2021), was chosen for discovering the story underlying a fragmented body of evidence (Greenhalgh, 1997, Bailey et al. 2015), and detecting recurring themes in studies (Cruzes and Dybå, 2011). We follow a two-stage review process. In the first step, thematic analysis was carried out manually in ATLAS.ti 22.0.5 software, following the guidance of Braun and Clarke (2006) (see supplementary material). The text was coded, and codes or groups of codes (nodes) were clustered and grouped to generate analytical themes (Thomas and Harden, 2008; Rathbone et al., 2017). In the second step, for each of the themes, a narrative method is used to synthesise meaning across studies, linking the identified dimensions into a story (Floersch et al., 2010). Deductive and inductive techniques were integrated into the coding process to combine existing theoretical concepts with new concepts that might emerge from the data, following Lewins and Silver (2007). Thematic maps were created to further analyse the results, visualise relationships and aid interpretation, by connecting the nodes and their interactions (edges) into a network and labelling the edges based on the type of relationship (Newman, 2010; Pokorny et al., 2017). Co-occurrence matrices and Sankey diagrams were used to explore relationships (Lewins and Silver, 2007), as the overlap of a set of specific codes across different papers reflects the conceptual relationships of those papers (Callon et al., 1983; Pandey et al., 2022). Appendix D summarises the main themes, examples of code groups, the associated codes, and the coded sentences.

3. Results

3.1. Study selection

Of the 207 publications in the full-text screening, 81 publications¹ passed to the analysis (Fig. 1). The main reasons for exclusion were: 1) little discussion of ownership, 2) not focused on the agri-food sector, 3) not focused on one of the pillars of sustainability, 4) focused on topics outside the scope of this paper, and 5) did not meet quality criteria. A summary of the papers included in the analysis can be found in Appendix E.

3.2. Study characteristics

The most studied pillar is economic sustainability (73 % of the papers), followed by the environmental pillar (11 %). Only 9 % of the publications considered all three pillars and only 4 % focused on social sustainability (Appendix F). Cooperatives and producer organisations (POs) are the most frequently studied ownership structures, followed by studies comparing cooperatives and investor-owned firms (IOFs),

¹ The full sample and its characteristics can be found in the supplementary material.

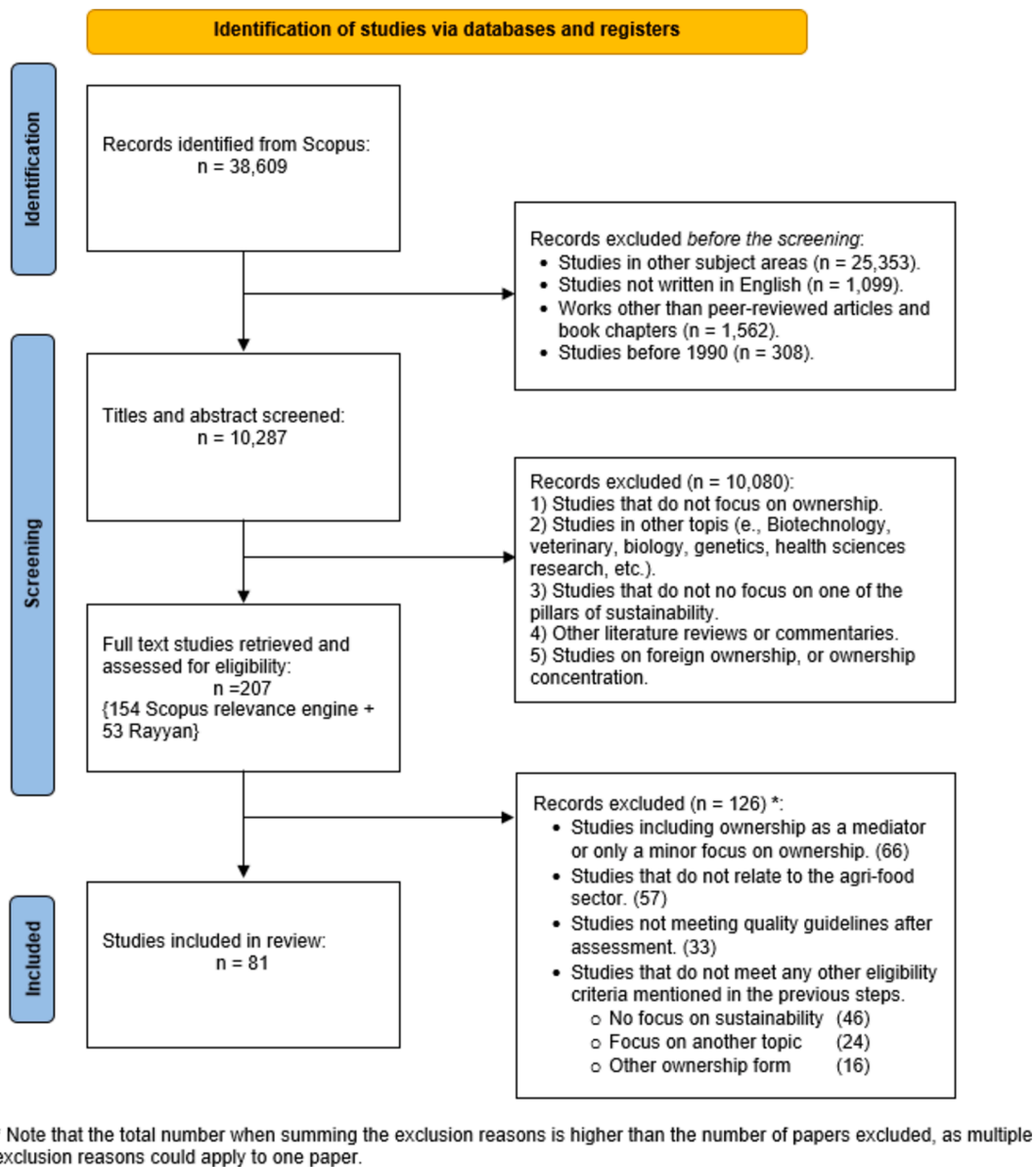


Fig. 1. Prisma flow chart. .
Adapted from: Page et al. (2021)

studies on family firms, and studies comparing family firms and IOFs (Appendix G). Only three publications in our sample used a qualitative methodology, while the majority opted for empirical methods such as stochastic frontier analysis, data envelopment analysis, econometric models and non-parametric statistics.

3.3. Synthesis results

3.3.1. Theme 1: Conceptualisation and operationalisation of the main variables

This section discusses the conceptualisation and operationalisation of ownership structure and sustainability. Conceptualisation refers to the process by which authors specify the precise meaning of specific terms, indicators and dimensions of the variables of interest (Babbie, 2017). Operationalisation concerns “the translation of abstract concepts into specific, observable measures” (De Vaus, 2001, p. 2).

Fig. 2 shows a categorisation of the main ownership structures studied in our sample. Cooperatives, the most frequently studied ownership structure, are “autonomous associations of persons united

voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise...based on the values of self-help, self-responsibility, democracy, equality, equity, and solidarity” (International Co-operative Alliance (ICA) (1995)). This conceptualisation remains consistent across studies (Katz, 1997; Rebelo et al., 2017). Related ownership structures are POs and restructured cooperatives. POs are democratic “membership-based organisations or federations of organisations with elected leaders who are accountable to their constituents” that aim to represent and defend the interests of member producers, provide economic services, and respond to social needs (Gersch, 2018, p. 18). Similar to cooperatives, they serve as a collective ownership structure for farmers to organise, gain benefits through group action and access high-value markets (Mourya and Mehta, 2021). Most studies describe POs by the same characteristics used to identify cooperatives. Only one paper explains that POs were created as a new ownership structure to overcome the disadvantages of cooperatives (Mourya and Mehta, 2021). Restructured cooperatives or new-generation cooperatives were created to obtain additional equity capital (Benos et al., 2016). Characteristics

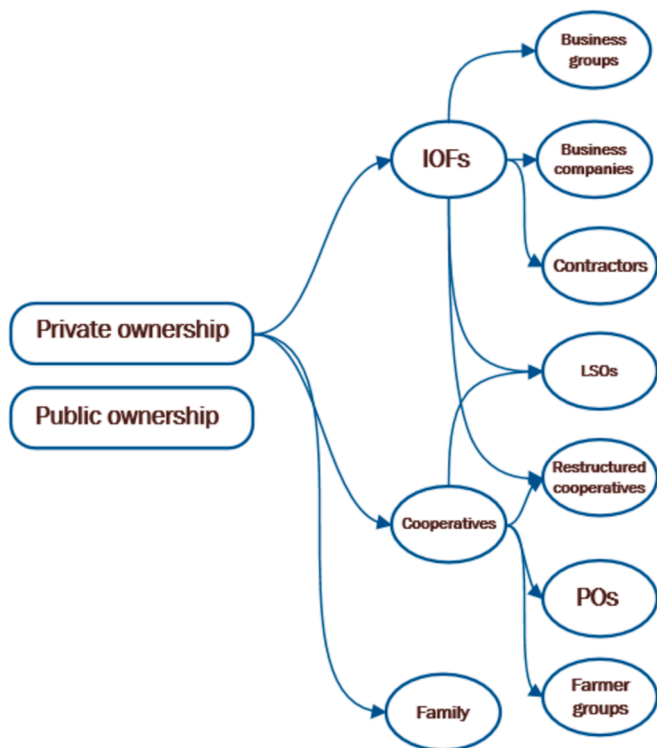


Fig. 2. Ownership conceptualisation.

that distinguish them from traditional cooperatives are proportional voting rights, individualised equity, and differentiated cost and pricing policies (Kyriakopoulos et al., 2004). Group farming or farming groups are also a collective ownership structure in which “small farmers voluntarily pool their resources (land, labour, capital, and skills) to create a larger enterprise (but without giving up rights to the land they own) and cultivate it jointly, sharing costs and benefits” (Agarwal, 2018, p. 58).

Another ownership structure usually studied in comparison to cooperatives is the IOF, defined in all publications as a company ‘owned, controlled and benefited by shareholders’ (Zhou et al., 2015, p. 2196). Other examples of terms used to present the same ownership structure are business enterprise (Adamisin et al., 2017), and contractor to distinguish IOFs from cooperatives based on their relationship with their suppliers. IOFs establish a relationship with their suppliers through contracts, whereas in cooperatives the suppliers are also the owners (Liang, Li, and Bai, 2021). Business groups are conceptualised as business organisations that own significant stakes in other businesses; these are entities typically linked through share pyramids, cross-ownership, vertical integration or horizontal integration (Tleubayev et al., 2021; Aibar-Guzmán et al., 2022).

Family firms are businesses in which ownership, control, and decision-making are maintained by family members and passed down through generations (Zhou, Li and Liang, 2015). They are governed and managed with the intention of shaping and pursuing the vision held by members of the same family (Dangelico, Nastasi and Pisa, 2019). The conceptualisation is consistent across publications.

Other ownership structures are large-scale successor organisations (LSOs) and private ownership. LSOs include both cooperatives and IOFs (Mathijs and Swinnen, 2001). Private ownership entails all ownership structures not owned by the state (Palcic and Reeves, 2015). LSOs are juxtaposed with family-owned firms, while private ownership is compared with public (state) ownership.

To operationalise ownership structure, most of the publications rely on pre-defined classifications in the databases used to collect their sample. Only for family ownership, a measure is usually specified, in

terms of whether family members are part of the management team, the board of directors or the workforce, the percentage of share capital they own, and their voting rights. In most cases, publications use a mix of these measures. As our analysis focuses on the ownership structure of the firm, publications on informal ownership structures (such as group farming) were not analysed further.

While ownership is conceptualised and operationalised in a fairly similar way across studies, the same cannot be said for sustainability performance. Fig. 3 presents the studied sustainability pillars and their conceptualisations.

Economic sustainability is the most studied pillar. The most popular conceptualization is efficiency measured via technical efficiency (TE), the ratio of “actual output to the potential maximum or frontier output of a production unit at given technology and input levels”. (Gong et al., 2019, p. 5). Profitability is the second most used conceptualisation, also referred to as financial viability or production welfare, operationalised by metrics such as profits, sales, or return on assets. Trade credit is also a financial conceptualization, important for commercial operations, measured by the ratio of receivables to sales (Martínez-Victoria and Maté-Sánchez-Val, 2021). Productivity is the third most used conceptualization, measured by the total productivity factor (ratio of total output produced by total inputs), the level of output and labour productivity. Profitability and solvency are important measures of the firm’s ability to meet long-term financial obligations, while productivity plays an important role in ensuring and improving food security and/or effective use of resources (Notta and Vlachvei, 2007; Ling, et al., 2022). Effectiveness assesses the successful operation and performance of the enterprise, measured by the number of sales, output volume or price, input costs, and employee or member income. Another conceptualisation is quality performance, which is defined as the quality of products (López-Bayón et al., 2018).

In the environmental pillar, the most used conceptualisation is sustainable or green innovation, which represents new advanced approaches to address existing and future environmental challenges by reducing resource consumption (Dangelico et al., 2019; Aibar-Guzmán, et al., 2022). It is operationalised through the firm’s view of green innovation (as a necessity or opportunity), the degree of radicality of the innovation, the degree of formalisation of the innovation process, the use of biotechnology, or via standardised sustainable innovation scores from databases such as the EIKON Environmental, social, and corporate governance (ESG) database (Nwankwo et al., 2009). Contribution to climate change is another conceptualisation, operationalized as the level of greenhouse gas (GHG) emissions (Baranchenko and Oglethorpe, 2012). Food safety management is conceptualised as practices at the production stage, such as “environmental inspection, input and production management, and pesticide residue testing” (Zhou et al., 2015, p. 2193). It is measured in terms of sustainable product certification, production process records, and pesticide residue testing. Pest management and chemical use are other concepts, with the former measured by the adoption of integrated pest management (IPM) practices and the latter by the dose of chemical inputs (Zhou et al., 2018). IPM uses available technologies with the aim of reducing the number of chemicals used for pest management (Ma and Abdulai, 2019).

Value-based supply chain, which entails “supply chains, embodying values of sustainability, equity, fair pricing and transparency” aimed to study both the environmental and social pillars (Hooks et al., 2017, p.65). However, no specification on the measurement of this conceptualization are provided. Rather, a qualitative approach was used to gain an understanding of how such chains work. A more widely used conceptualisation is CSR, a multidimensional concept that refers to legal, economic, ethical and philanthropic corporate responsibilities and actions aimed at promoting a social good beyond the interests of the firm (Hajdu et al., 2021; Bavorova et al., 2021; Martos-Pedrero et al., 2022). CSR is operationalised by firms’ scores on various sustainability metrics (Martos-Pedrero, et al., 2022), their support for the development of social and rural infrastructure (Bavorova, et al., 2021), or the extent and

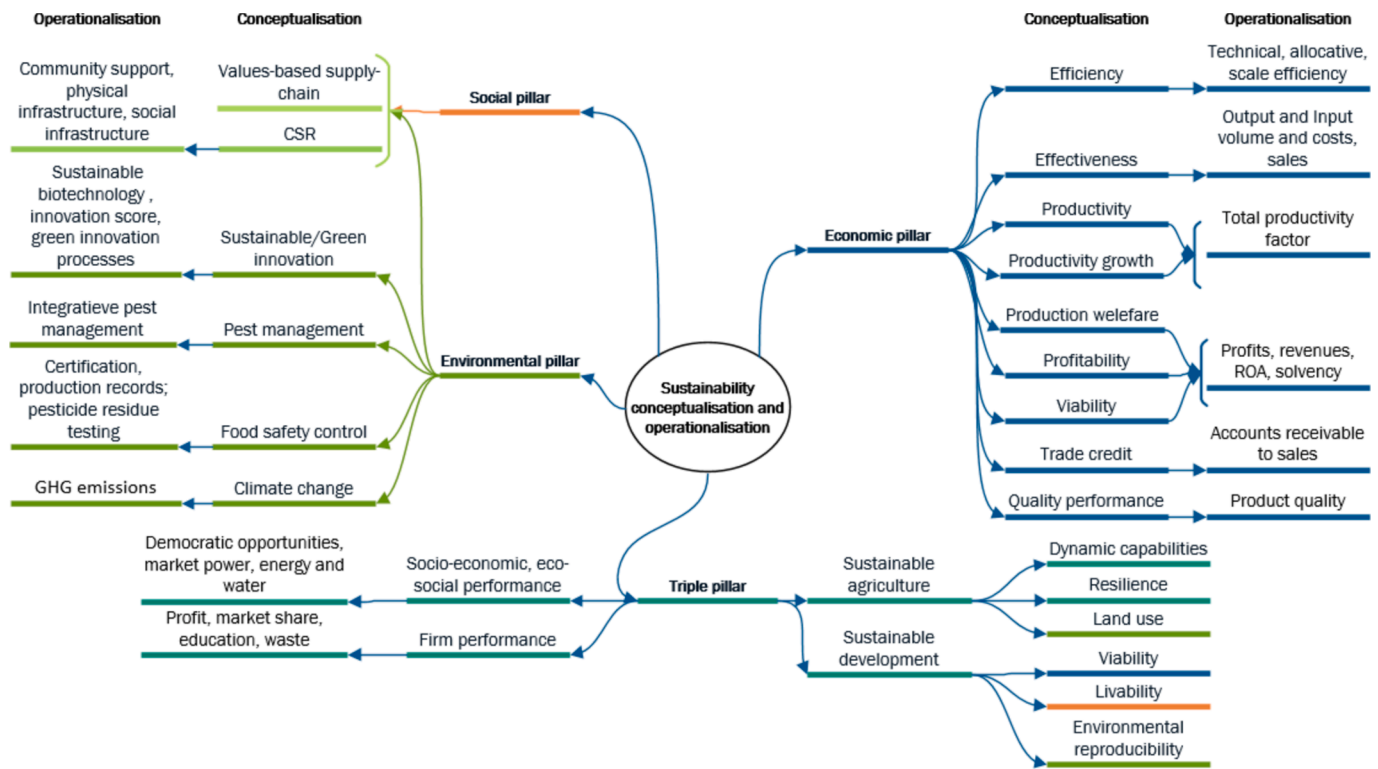


Fig. 3. Sustainability conceptualisation and operationalisation.

quality of their CSR disclosure (Westerholz and Höhler, 2022).

Conceptualisations that have been linked to multiple pillars include company or farm performance (through a contractual relationship with an agri-food company), socio-economic and eco-social performance, and sustainable agriculture. Firm performance is the most common conceptualisation across the sample. Most publications conceptualise firm performance under the economic pillar, operationalised by profit margins, turnover, market share, return on assets, return on sales and liquidity. Some publications define it in relation to the social pillar, operationalised through education and training provided to members or employees, or reduction in income inequality (Mourya and Mehta, 2021; Ofori et al., 2019). Environmental operationalisations include waste, crop diversity and the use of chemical inputs (Saunders and Bromwich, 2012; Mourya and Mehta, 2021; Ofori et al., 2019). Socio-economic and eco-social performance are defined as a company's efforts to gain market power while ensuring human development and responsible use of natural resources (Thomas et al., 2011; Giagnocavo et al., 2018). Socio-economic indicators include market power, stable employment, equitable income and low-risk exposure; eco-social indicators measure water, pesticide, waste and energy consumption. Other concepts include sustainable agriculture and sustainable development. In one publication, sustainable agriculture had only an environmental focus, operationalised through land use (Callagher et al., 2022). In Sutton-Brady and Raswant (2016), only the social pillar is addressed, defined in terms of promoting sustainable development through sustainable consumption. It is measured through the promotion and development of healthy products, awareness raising, and community education. Ji et al. (2018) define sustainable agriculture as efforts to meet food security and economic generation needs while using inputs in a 'greener' way. Dynamic capabilities and resilience address all three pillars. Dynamic capabilities include the ability to integrate and reconfigure resources to create change in the market, while resilience is the ability to adapt and recover from shocks (Ji et al., 2018). Berge et al. (2021) use sustainable development, which is conceptualised as a process that relies on mutually beneficial exchange and social development. Economic measures

include income, efficiency, and yield; environmental measures are fertiliser dose, soil erosion level, tree density and crop diversity; and social measures include self-consumption, wealth level and diversity of social organisations.

3.3.2. Theme 2: Ownership characteristics

Ownership structures have a number of distinguishing characteristics (Fig. 4), the first being their goal. The primary objective of an IOF is to maximise financial returns for its shareholders (D'Amato et al., 2021). In contrast, the purpose of a cooperative is the provision of the best products and services to its members and the promotion of their economic and social well-being (Nwankwo et al., 2009). Family firms aim to generate wealth for the family, to preserve the business, and to pass it on as a legacy to future generations. Family firms are driven by non-financial objectives such as protecting and increasing socio-emotional wealth (SEW), defined as "the satisfaction of needs for belonging and intimacy, the perpetuation of family values through the business and the preservation of the family dynasty..." (Gómez-Mejía et al., 2007, p. 108). Second, the internal governance system differs between ownership structures. In IOFs, the size of the shareholding influences decision-making power. In co-operatives, member-owners have democratic control rights under the 'one member, one vote' rule. In family firms, family members often occupy board positions, giving them a strong authority within the enterprise. Third, the way in which these ownership structures are equity financed also differs. IOFs are financed by the sale of shares, cooperatives are financed by members' equity (direct investment, retained patronage refunds) and family firms are financed by the investment of family members.

Fourth, the firm's goal, governance system, and financial structure determine the business strategies adopted by firms. A family firm is interested in the long-term preservation of family wealth and family owners often have most of their wealth concentrated in their business, exposing them to greater risks than investors with a broad portfolio. These characteristics influence investment decisions, with family firms being more conservative and risk-averse. Therefore, while family firms

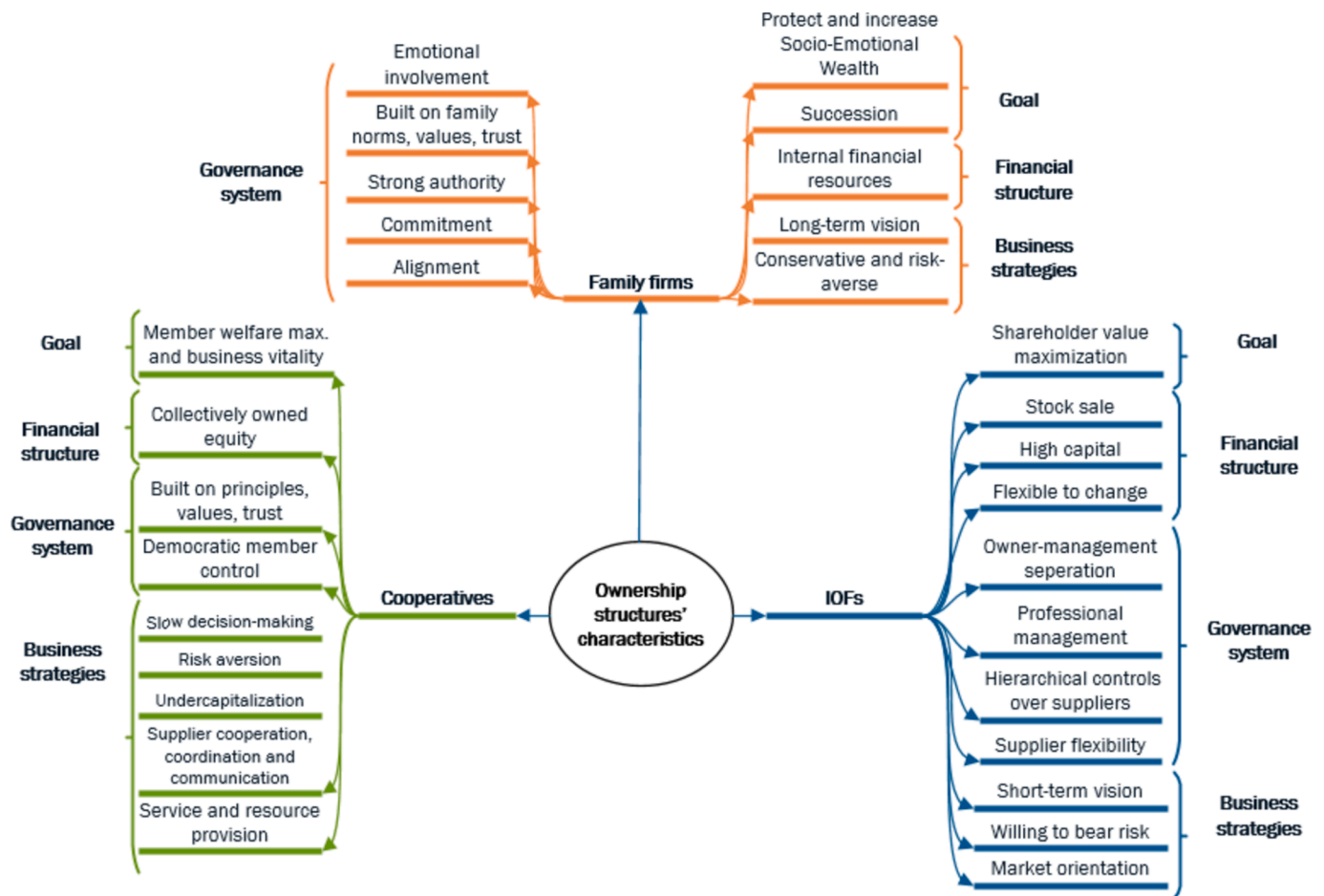


Fig. 4. Characteristics per ownership structure.

may be willing to make changes to ensure long-term successful performance, they may avoid risky investments (Aibar-Guzmán et al., 2022). In comparison, IOFs have a more short-term focus on profit maximisation coupled with greater access to capital and high market orientation. This makes IOFs more willing to take risks and introduce changes (Vozárová et al., 2019). In cooperatives, the way the board and management approach investment decisions and profit distribution is influenced by the focus on improving the overall well-being of members. This guides more collaborative and coordinated strategies. However, as cooperative members' equity is the main source of funding, cooperatives are less inclined to start new projects and engage in risky initiatives (Soboh et al., 2012). Moreover, due to their structure and democratic control, cooperatives exhibit a slower decision-making process and response to emerging opportunities compared to IOFs (Ozden and Dios-Palomares, 2016).

3.3.3. Theme 3: Theoretical underpinning

Only 27 of the publications included in our review incorporated theoretical arguments to explain the relation between ownership structures and sustainability performance. The theories and their application are shown in Fig. 5 and Appendix H.

The most used theories are property rights theory, agency cost theory and transaction cost theory. Property rights theory explains how the ownership structure determines the distribution of property rights over assets among the agents involved in the firm (Kang and Sørensen, 1999). Agency and transaction cost theory describe how firms face costs when these property rights are fragmented. Due to the separation of ownership and control, agency theory explains how firm performance can be negatively affected when self-interested managers put their own

interests ahead of those of the owners. Transaction cost theory suggests that firms face costs associated with monitoring, controlling and managing transactions due to property rights and agency problems, and defines the optimal ownership structure as one that minimises these costs (Kang and Sørensen, 1999). Despite the connection between these theories, only one paper in the sample uses them conjunctively to explain differences in quality performance between IOFs and cooperatives (López-Bayón et al., 2018).

These theories have been used to highlight the unique characteristics of each ownership structure and how they can translate into different sustainability outcomes. Based on property rights theory, cooperatives are characterised as a structure with poorly-defined property rights (Krasnozhan, 2011), as members play different roles within the cooperative (owners, suppliers and managers). This structure creates a governance system with contractual incompleteness and potential conflicts of interest (Rebelo et al., 2017), which influences investment incentives and increases vulnerability to collective action problems. Such problems may undermine the economic and product quality performance of cooperatives compared to IOFs (López-Bayón et al., 2018). Collective action theory supports this line of thinking. Despite the assumption that a group of people with a common interest will act in their collective interest, the group members may struggle to do so because rational and self-interested individuals have incentives to free-ride on the work of others (Olson, 1965). Moreover, cooperative pooling practices allow members to share the costs and benefits of the traded commodity, and makes them vulnerable free-riding behaviour (López-Bayón et al., 2018). IOFs, on the other hand, do not have such free-rider problems.

These arguments are countered by social capital and stakeholder

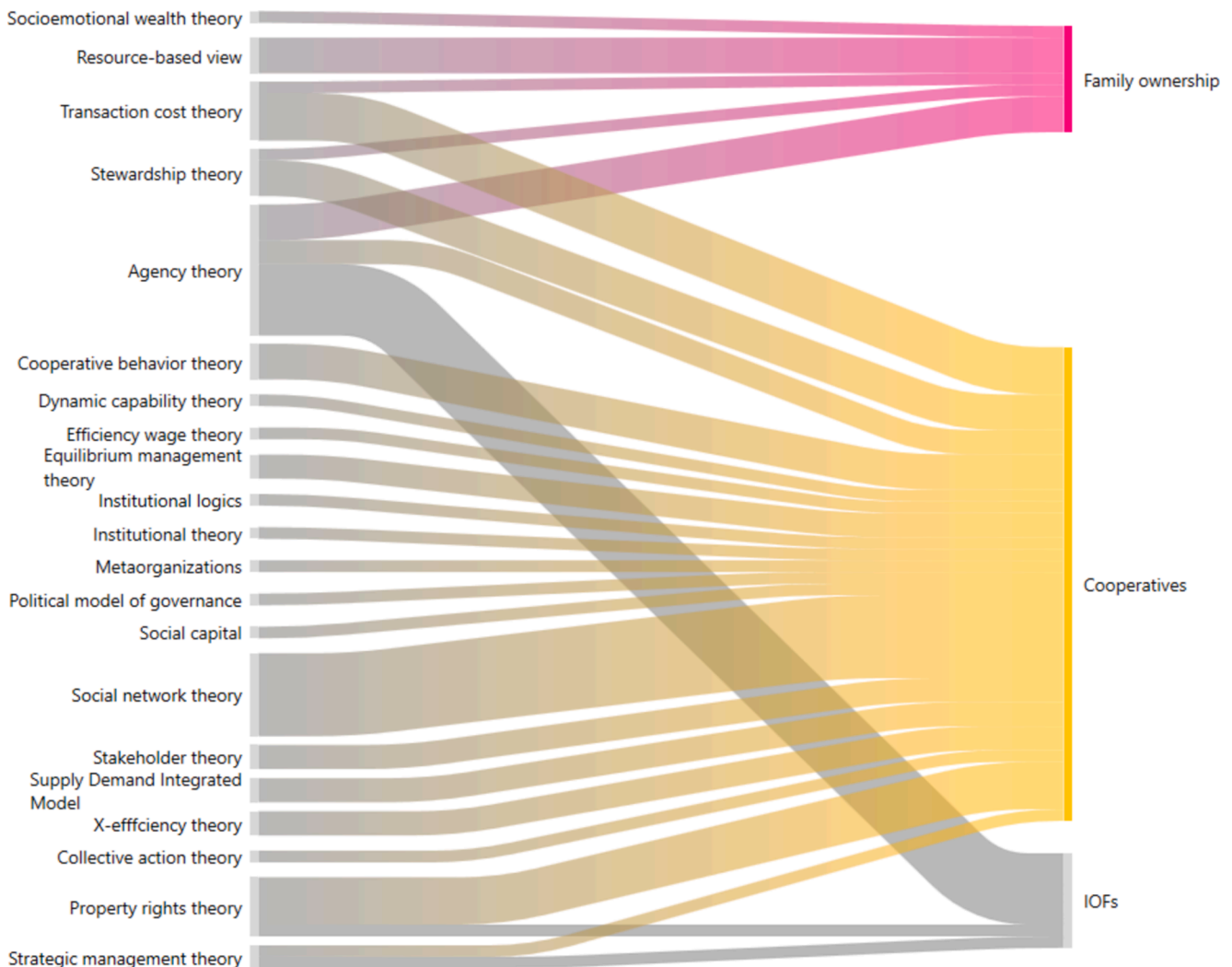


Fig. 5. Theory application per ownership structure.

theories. Due to their collective ownership and community embeddedness, there is typically more trust and reciprocity among actors in cooperatives than in IOFs. This leads to greater willingness to cooperate, lower agency costs, easier access to information and lower transaction costs (Zhou et al., 2018). Moreover, agency theory suggests that in IOFs where ownership and management are separated, firm performance may not be optimised if there are competing objectives between owners and management, in contrast to cooperatives which are owned and controlled by their users (Katz, 1997; Gentzoglani, 2007). Combined with their short-term horizon, these characteristics lead IOFs to pursue short-term gains (Aibar-Guzmán et al., 2022). While this may lead to higher economic performance, it impedes environmental sustainability.

The theories of strategic management, cooperative behaviour and the political model of governance explain why IOFs and cooperatives differ in their sustainability performance due to their different objectives, strategies and risk attitudes. While cooperatives aim to increase the welfare and benefits of their members, IOFs aim to maximise shareholder value. Consequently, the two ownership structures adopt different business strategies and resource allocation strategies towards sustainability initiatives (Katz, 1997). For example, cooperatives tend to adopt more risk-averse strategies because cooperative business activities need to be aligned with member business activities, while shareholders in an IOF can relatively easily sell their shares. This risk aversion could lead to cooperatives missing out on sustainability business opportunities which entail higher risk.

The remaining theories explain the way the characteristics of cooperatives allow for enhanced sustainability among members compared to nonmembers. First, according to institutional logics theory, balancing competing economic and environmental goals is necessary to resolve sustainability challenges. Together with the theory of meta-organisations, these theories underline how cooperatives can successfully initiate and spread sustainable practices across the value chain through collective ownership, democratic member control, and services like knowledge exchange, joint creation, and collective learning (Callagher et al., 2022). Second, the dynamic capabilities theory argues that the services cooperatives provide to members make up cooperative dynamic capabilities that aid in realising sustainable agriculture. These capabilities include access to new market opportunities (adaptive capability), access to purchasing channels, training, capital (absorptive capability), and the capacity to innovate (innovative capability) (Ji et al., 2018). Third, social network theory explains how cooperatives achieve sustainable agriculture via their high willingness to network, cooperate, share information and build connections with their communities (Sutton-Brady and Raswant, 2016). The equilibrium management theory argues that cooperatives, due to their goal of meeting both market and member needs (Côté, 2019), are an effective ownership structure for putting in place a cohesion between economic, social, and environmental objectives and achieving sustainable development (Berge et al., 2021). The transaction costs, x-efficiency, and efficiency wage effect theory provide support for the superior efficiency of cooperatives through (1) better

coordination and collaboration based on common goals and principles and (2) lower transaction costs through joint marketing, input purchase, and economies of scale (Verhofstadt and Maertens, 2014). Moreover, their self-exploitation nature offers cooperatives the advantage of self-imposing income reductions to preserve the cooperative’s economic durability (Altman, 2015).

In the context of family firms, stewardship theory argues that they face lower agency costs than non-family firms because the entire firm operates with the common goal of enhancing the well-being of the family and the firm, resulting in better performance in terms of the firm’s economic viability (Azizi et al. 2021). This common goal is achieved as family members shape and transfer the firm’s mission, values and practices throughout the firm through their strong governance and executive roles (Dangelico et al., 2019). Based on the resource-based view, family ownership also possesses unique resources and capabilities, such as human and relational capital, and better owner-management alignment, which contribute to performance enhancement (Aibar-Guzmán et al., 2022). Nevertheless, based on the SEW and agency theory, family firms are driven by long-term economic motivations and tend to adopt more risk-averse business strategies to protect the SEW. Thus, family firms may avoid or postpone sustainable innovations, leading to lower social and environmental sustainability performance (Dangelico et al., 2019).

3.3.4. Theme 4: Sustainability pillar, results, and ownership structure relation

The sustainability conceptualisations studied in relation to the ownership structures are depicted in Fig. 6 and Appendix I.

Most publications explore the performance of cooperatives in terms of economic performance, followed by environmental and social initiatives. Another popular topic is the comparison of IOFs and cooperatives, mostly focussing on the economic pillar. Family firms are studied in terms of the economic and environmental pillar (often in comparison with IOFs), while the interest in social sustainability of family firms has been relatively low. Only one publication compared all three ownership structures and seven publications focused on all three pillars of sustainability. The results of the studies can be found in Fig. 7 and Appendix J.

The main conclusions derived from the findings can be classified according to the sustainability pillar and the metrics examined. First, IOFs tend to outperform other ownership structures on most economic sustainability indicators. IOFs are shown to be more profitable than cooperatives. This can be attributed to the differences in their firm objectives, as cooperatives aim for higher benefits to their members rather

than increasing profits (Notta and Vlachvei, 2007). Furthermore, IOFs’ larger capital and higher willingness to bear risk are important factors for profitable firms (Vozárová et al., 2019). IOFs also exhibit a higher market share, and generate more efficient sales, meaning they are more competitive than cooperatives. This can be attributed to the differences in their firm strategies, as IOFs tend to be more market-oriented, focusing on customer satisfaction, while cooperatives are focused on their members (Notta and Vlachvei, 2007). Another difference that impacts performance is the property rights structure of cooperatives, which makes them more susceptible to collective action problems and supplier inflexibility. This can impact investment incentives (López-Bayón et al., 2018). IOFs can achieve better economic performance by setting up hierarchical controls over their supply and through their higher flexibility in modifying their supply base.

Some publications observed mixed or contradictory findings and it is important to explore the reasons for such divergences. In the case of efficiency, the majority of the publications provide evidence of IOFs outperforming cooperatives, due to the cooperative control costs, non-preferential treatment between suppliers (Mosheim, 2002; Bakucs et al., 2012), slow decision-making process (Ozden and Dios-Palomares, 2016) and the focus of cooperatives on increasing member welfare (Soboh et al., 2012). Meanwhile, IOFs have higher flexibility, management professionalisation, and orientation toward firm value maximisation (Adamisin et al., 2017). However, Beber et al. (2021) find that cooperatives are operating more efficiently than IOFs in rural areas of Brazil, possibly because local milk supply structures create monopsony power. Martínez-Victoria et al. (2018) observed a similar finding, with cooperatives being more profitable only in less developed regions of Spain by creating more competitive positions.

Despite cooperatives’ lower economic performance (relative to IOFs), they provide significant benefits upstream of the value chain, with members outperforming non-members in terms of returns, productivity, and efficiency. This can be attributed to the firm goals and strategies which are focused on the income maximization of their members. Cooperatives realise lower costs and higher input quality for their members by providing their members with higher market power, access to market information, and economies of scale (Piesse et al., 1996; Krishnakumar et al., 2009; Zamani et al., 2019). Additionally, cooperatives facilitate the adoption of new technology, food certifications, and assist in adapting practices to requirements through farm inspections, training, and covering any extra financial costs (Wang et al., 2019; Lin et al., 2022). Farmers in a contractual arrangement with IOFs exhibit lower profits and no significant income rise compared to independent farmers. IOFs can, however, encourage farmers to adopt quality



Fig. 6. Sustainability pillars and ownership structure relation studied.

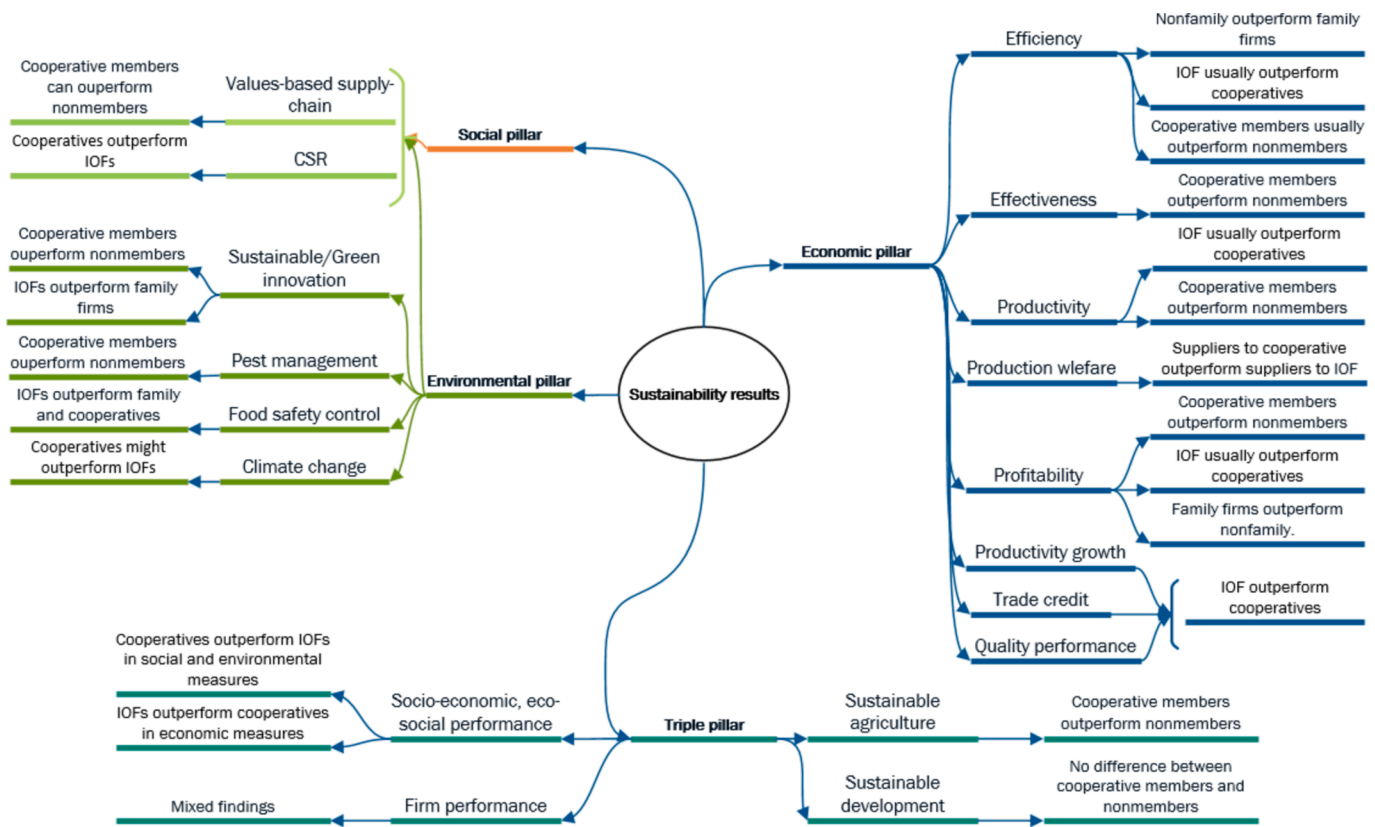


Fig. 7. Empirical evidence per sustainability pillar and conceptualisation.

certification, given that IOFs are market-oriented and concerned with the perceived value of the goods in downstream marketplaces. Meanwhile, farm yield, profit, income, and quality certification are all significantly higher for cooperative members (Liang et al., 2021).

Family firms can outperform other ownership structures on economic viability because of their firm goals of long-term horizon and the alignment within their governance system. Family ownership is linked to lower debt and higher liquidity levels compared to non-family firms, despite being smaller, resulting in higher profits (Galdeano-Gómez et al., 2006). This is explained by their risk-averse business strategy, due to the family’s wealth directly linked to the company, resulting in a generally more stable enterprise. However, in the case of governance issues, such as potential conflicts between family and corporate goals, and nepotism (where family members are preferred over more professional alternatives), family firms can be less efficient than non-family firms (Kotey and O’Donnell, 2002).

Second, cooperatives outperform IOFs in most of the environmental and social pillar conceptualisations, through their high involvement upstream of the value chain. In terms of climate change, IOFs typically do not work directly with farmers, and investments are usually on profit-making pursuits rather than on farm improvements (Baranchenko and Oglethorpe, 2012). Conversely, cooperatives have the benefit of an efficient logistics system, lower new machinery cost, and higher utilisation rates, resulting in lower GHG emissions. Farmers have also stated becoming aware and more willing to adopt sustainable innovations proposed by cooperative leaders because of their proven track record of representing members’ interests (Nwankwo et al., 2009). Cooperatives can overperform IOFs in terms of CSR performance, as the principles of cooperatives, like self-help and responsibility, democracy, equality, and solidarity, are very similar to the values espoused by CSR. The governance structure of cooperatives permits a stronger integration of its stakeholders, which promotes communication, coordination, transparency, and trust (Martos-Pedrero et al., 2022). In the eco-social

and socio-economic conceptualisation, cooperatives enhance living and working conditions, employment for women and underrepresented groups, equitable incomes, social advancements, and democratic expressions (Thomas et al., 2011; Giagnocavo et al., 2018). Cooperatives work with their local communities and are more inclined to offer financial support for innovation, efficient resource use, raising awareness, and farmer support through requirements for sustainable advancement (Giagnocavo et al., 2018) because farmers have a significant role as stakeholders in these organisations (Bavorová et al., 2021). However, IOFs have been shown to be better at reporting their CSR initiatives and performance compared to cooperatives, which further supports the idea that IOFs are more market-driven (Westerholz and Höhler, 2022). IOFs also have better product quality controls, compared to both cooperatives and family ownership, as consumers place a higher emphasis on product quality (Jie-hong et al., 2015). Farmers who supply to IOFs must also produce in accordance with their requirements, to ensure a market for their goods. Cooperatives, being comparatively less profit-oriented and facing higher quality control costs, exhibit lower levels of food quality control. Family ownership has limited control practices due to a shortage of financial capital (Jie-hong et al., 2015).

Family firms are driven by internal family values, cultural incentives and economic decisions with long-term implications. Since most sustainability initiatives require capital-intensive expenditures and equipment, family firms are reluctant to adopt them, seeing it as a threat to the value for the next generations. This leads to family firms underperforming compared to IOFs (Aibar-Guzmán et al., 2022), which are influenced by market and customer demands and see sustainable innovation as a necessity to increase their market share (Dangelico et al., 2019).

Last, studies on firm performance present mixed results. Most of the studies show that cooperatives successfully offer economic benefits to farmers (Chagwiza et al., 2016; Tefera and Bijman, 2019) and encourage farmers to adopt sustainable farming practices (Ma et al., 2022).

However, cooperatives can struggle financially due to a lack of capital (Mourya and Mehta, 2021), management issues and free riding (Alemu et al., 2016). Ofori et al. (2019) found that vegetable cooperatives in Cambodia can increase information, training, and sustainable practices but not income or profits for members. However, the failure to generate a positive effect on income is attributed to the short time the cooperative had been operational at the time of the study. IOFs have higher profits and lower costs compared to cooperatives (Soboh et al., 2011). Nevertheless, D'Amato et al. (2021) found that cooperatives outperform IOFs in certain territories, where they have a longer history in the region, are better established, and are dedicated to creating a successful networking strategy for development. Lerman and Parliament (1990) found that US fruit and vegetable cooperatives had lower firm performance than IOFs, however, dairy cooperatives performed significantly better than dairy IOFs. Fruit and vegetable cooperatives differ from dairy cooperatives as they deal with a variety of non-homogeneous products that are vulnerable to fluctuations in consumer demand and their inflexibility in managing the mix of the members' supply makes them inferior to IOFs. Nevertheless, the study was carried out in the US during the period of 1976–1987 and a lot of adjustments and advancements occurred in the industry since then.

4. Discussion

The results reveal that most publications concentrate on a single ownership structure, or the comparison of IOFs and cooperatives. Family ownership and the comparison of more than two ownership structures remain relatively understudied. This makes comparison between studies difficult. Results also show that cooperative ownership is studied without much attention to the wide variety of cooperative structures and the differences among them. In addition, there is a lack of studies that assess the environmental and social dimensions or all three pillars, their interactions, and trade-offs. The wide variety of conceptualisations and even more diverse operationalisations of sustainability performance, together with the limited comparative research, contribute to the inconsistency of the findings. Furthermore, most publications rely on previous empirical findings to support their hypotheses, rather than using theoretical models or arguments. Among the publications that do, old theories are used and applied to a limited extent, with the most used theories being property rights, agency costs, and transaction costs theory.

Our study identifies and categorises the main firm characteristics that differentiate ownership structures: the firm's objectives, capital structure and governance system, which together drive the firm's strategy. Moreover, we link these characteristics with the applied theories and empirical evidence to provide a clear understanding of the relationship between ownership and sustainability. We find that the empirical evidence and theoretical arguments are consistent, suggesting that ownership structure determines unique firm characteristics, which in turn lead to different sustainability outcomes. The divergence between studies occurs because, rather than there being a clear-cut direction of the relationship where one ownership structure is better than another in achieving sustainability, there is a complex situation where some characteristics can positively affect one area of sustainability but negatively affect another. Furthermore, although there is a relationship between the different theories, most papers only use one of them. As each theory addresses a limited number of characteristics defined by the ownership structure, the application of only one theory is insufficient to capture the full effect of ownership and its complex relationship with sustainability. For example, based on comparative empirical studies, cooperatives appear to outperform other ownership structures in the environmental and social sustainability pillars. Theoretically, this is attributed to cooperatives' supplier focus and their goal of maximising member benefits. Additionally, cooperatives have more trust and reciprocity among actors, leading to greater willingness to cooperate based on common goals and principles, which is a very important success

factor for supply chain sustainability. Nevertheless, cooperatives exhibit lower efficiency, which is theoretically explained by poorly defined property rights which give rise to collective action problems. IOFs appear to perform better in terms of economic sustainability and in communicating sustainability performance and plans to shareholders. This is attributed to their greater market orientation and prioritisation of shareholder value. Meanwhile, their profit maximisation objective and short-term horizon may have a negative impact on environmental and social sustainability performance. Consequently, the two ownership structures adopt different business strategies and resource allocation strategies towards sustainability initiatives. Family firms can outperform the other structures in financial viability, due to their long-term horizon and the family member representation in their governance system. However, they underperform on most other sustainability dimensions, particularly innovation and investment-intensive opportunities. This occurs as family firms are driven by long-term economic motivations and tend to adopt more risk-averse business strategies to protect socio-economic wealth.

5. Conclusion

This paper provides a systematic synthesis of theories and empirical evidence on the relationship between firm ownership structure and sustainability performance in agri-food chains. Our research makes important contributions to the field by connecting the fragmented literature, linking the conceptualisations and metrics used to measure the main variables, theoretical frameworks applied, ownership structure characteristics and sustainability outcomes. We were able to identify the main reasons for the divergence between the papers, and map the relationship between each ownership structure and each pillar of sustainability. The results provide several suggestions for future research.

5.1. Limitations

This paper provides a comprehensive overview of a focused body of literature in a transparent and systematic manner. However, this review is not without limitations. Only English-language publications were included, leaving out contributions from, for example, the Spanish or German literature on the subject. Furthermore, the scope of this article is limited to publications that specifically address the main ownership structures in the agri-food sector in relation to sustainability. Papers that measured ownership in terms of other concepts, such as foreign ownership and ownership concentration, were excluded. Nevertheless, the main findings on the relationship between owner identity, ownership characteristics and firm governance structure and sustainability performance are also applicable to other sectors, as they are consistent with previous findings across sectors (Kapopoulos and Lazaretou, 2007; 2008). In addition, the thematic synthesis method and the coding process require interpretation and decision-making by the authors. Nevertheless, by providing detailed explanations of the process, decisions made, and tools used, this study provides highly transparent results that can be replicated in future studies. This review is a first step in uncovering potentially important findings that can be further explored in future studies.

5.2. Implication and future studies

The findings of this paper provide important insights for future studies in the agri-food sector and the broader literature on ownership structure, governance, and sustainability performance. First, the existing literature has a strong focus on the relationship between ownership and economic sustainability. Future studies should consider environmental and, in particular, social sustainability. In addition, metrics that represent all three pillars of sustainability and the inclusion of more than two different ownership structures are needed to facilitate comparisons. Despite the benefits of such focused work, the lack of holistic studies

may exacerbate the challenge of the scattered evidence that we face today. As existing studies already provide many ideas on how to operationalise sustainability performance, this review can guide replication studies which would prove beneficial for generalising results. Meanwhile, more consideration is needed for ownership operationalizations (e.g., that distinguish different forms of cooperatives), instead of relying on pre-defined database classifications. Second, existing studies tend to use past evidence, single theories, or old theoretical models to support their arguments. Given the close link among different theories and the fact that single theories only address part of the differences between ownership structures and their impact on sustainability performance, theory building and creative combinations of existing theories may be another avenue for future research. Third, theoretical arguments and empirical evidence suggest that ownership might also be impacting sustainability performance indirectly through the firm characteristics it defines. However, explicit consideration of moderating and mediating relationships is missing from the literature. Future research across various industries can consider studying whether ownership structures can indeed negatively impact one sustainability domain but positively another, as mediated/moderated by their unique firm characteristics. A potential hypothesis to be explored is whether the outperformance of one ownership structure on some sustainability indicators is mediated/moderated by their unique characteristics, which may focus the attention of the firm on different parts of the value chain. For example, the objectives of cooperatives and their governance structure of being owned and controlled by farmers may drive the focus of cooperatives further upstream in the value chain. Meanwhile, the objectives and business strategy of IOFs appear to focus on the downstream part of the value chain. This focus, together with their capital advantage, could be a driver for IOFs to produce more sustainable and innovative products. In conclusion, the results of this study can guide many future avenues which would highly contribute to a more detailed understanding of the relationship between firm ownership and sustainability performance.

CRedit authorship contribution statement

Megi Gega: Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Julia Höhler:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Conceptualization. **Jos Bijman:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Conceptualization. **Alfons G.J.M. Oude Lansink:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.clscn.2024.100193>.

Data availability

Data will be made available on request.

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