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Article

# Harnessing a ‘Currency Matrix’ for Performance Measurement in Cooperatives: A Multi-Phased Study

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**Abstract:** The cooperative organizational form is by nature a sustainable one, which has proved to be resilient in the face of crises and a solid lever in addressing present-day societal challenges. Still, little is known about its socio-economic impact. Also, despite the plethora of studies on cooperative performance, research remains inconclusive about how to best measure it. In fact, scholarly work has largely favored the use of appraisal tools reflecting those of investor-owned firms (IOFs), having undermined the dual idiosyncratic nature of the cooperative organizational form, which is manifest in the business and social-membership objectives. The goal of this article is to fill these gaps by delivering a comprehensive dashboard for cooperative performance assessment that harmonizes business–social aspects and catalogs the basic components for future attempts. To reach this goal, we used an extensive review of empirical research in cooperative performance (phase 1) and a Delphi study with 14 experts (phase 2). In addition, we reviewed comparable research efforts for a business form (social enterprises) that combines business with social goals and faces similar challenges (phase 3). This inquiry was particularly insightful for the social perspective and the overlooked role of cooperatives as a socially-embedded organizational form that hardly documents its societal impact and outreach.

**Keywords:** performance measurement; cooperatives; extensive review; Delphi method; interdisciplinary dialogue; social enterprises; socio-economic impact

## 1. Introduction

On the “International Day of Cooperatives” in 2015, the former United Nations Secretary-General Ban Ki-Moon appealed for all people to “recommit to the cooperative business model, which could help make the vision of a sustainable future a reality for everyone” [1]. Indeed, as member-owned,

value-based, people-centered and principle-driven organizations, cooperative enterprises are by nature a sustainable and participatory business form, which have shown remarkable resilience in the face of economic and financial crises [2,3]. Notably, cooperative employment involves at least 279 million people in the world, almost 90% of whom are farmers organizing their production within the scope of cooperatives [4]. Cooperatives contribute to sustainable development well beyond job creation [5], however, often serving as frontrunners of social and environmental innovation, and habitually setting benchmarks that others follow (e.g., as the first ever organizations to grant women the right to vote and own shares) [3,6,7]. In fact, the cooperative organizational form has proved to be particularly suited in addressing contemporary societal challenges too, such as protecting the environment (e.g., organic farming and consumption, financing of environmentally friendly projects), mainstreaming product-related novelties (e.g., fair trade, nutritional labelling), and providing a range of affordable financial services to or securing employment for marginalized groups (e.g., hiring or granting loans to socially disadvantaged people) [8,9].

Nevertheless, knowledge about cooperatives' socio-economic impact is rather limited [10], mainly due to the scarcity of measurement and reporting by cooperatives themselves in addition to the dearth of comprehensive datasets on their outcomes [11]. For example, although sustainability reporting is increasingly a default practice of organizations worldwide [12,13], the vast majority of cooperatives do not prepare any sustainability reports [14]. Actually, cooperatives less consistently measure performance in general, let alone report it [15], even though the subject of business performance assessment continues to top the academic and practitioner agenda [16,17] and despite systematic research initiatives on measurement and reporting, like that of the "Centre of Excellence in Accounting and Reporting for Co-operatives" (CEARC) in Canada (see [18]) or that of "Co-operatives UK" (see [19]). On an aggregate basis, the "World Co-operative Monitor" initiative is practically the only regular public reporting of economic and social data on the global cooperative movement [20]. At the same time, although academic studies and policy reports on cooperative performance abound (see [21,22] for an overview), the debate on how to best appraise it is open [23–26]. In other words, the need for conceptual and empirical consolidation of research on the issue of cooperative performance measurement remains pertinent [11].

Moreover, extant research customarily has neglected to specifically address the nature of cooperative distinctiveness interlinked with the pursuit of dual performance objectives [21,27,28], having favored the corporate over the member orientation. Prior work has focused on readily available financial accounting measures commonly used to evaluate investor-owned firms (IOFs) or has applied advanced quantitative techniques (e.g., data envelopment analysis) to estimate economic and technical efficiency [22]. Likewise, in practice, most cooperatives that engage in reporting have employed tools that were designed for IOFs (e.g., Global Reporting Initiative (GRI) and Leadership in Energy and Environmental Design (LEED) for sustainability metrics) [14]. The unquestioning use of accounting and reporting standards reflecting those of IOFs merely bolsters isomorphic tendencies [11], to the detriment of the social-membership perspective [29,30]. Of course, this might be predisposed by the underlying trend of 'professionalization' or 'corporatization' [31,32], which undermines the specificities of cooperative organizations [33,34], and time and again raises identity or even mission drift concerns [35–37]. Besides, mainstream management research has called for appropriately aligning the measurement of organizational performance with the research contexts in question along a more human-centered approach [16,38].

The objective of our study is to deliver a comprehensive dashboard for cooperative performance assessment which mirrors the cooperative organizational form's idiosyncrasies and harmonizes business–social aspects. To address our objective, we consolidated empirical research on cooperative performance metrics, created a new framework, and empirically tested it with experts' views. More specifically, we first conducted an extensive literature review on empirical academic and policy work, drawing from an extended pool of articles and reports published over the past 40 years, paying equal attention to the business and membership perspectives as well as the different sectors. However, we

concentrated on work in the agricultural domain and tailored the framework accordingly. We then tested it with input from a Delphi study with cooperative experts and narrowed it down to a workable dashboard of three sub-categories. We also set forth a manageable bundle of metrics that could be utilized by future work, even though we posit that future studies should select metrics in line with their context and research goals.

Furthermore, inspired by the interdisciplinary conversations between cooperatives and non-profit organizations put forward by Valentinov and Iliopoulos [39] and between cooperatives and social enterprises set out by Borgaza et al. [40], we proceeded to complement the proposed framework with a review of the literature on the performance of social enterprises. In the quest for counterpoising the counter-productive pro-IOF isomorphism while facilitating a productive inter-organizational ‘fertilization’, we set out to prompt an interdisciplinary dialogue between organizations that not only differ from IOFs but also face similar ends and challenges. Undeniably, cooperatives and social enterprises could be an integral part of such an endeavor, as both are devoted to accomplishing (social) missions and bound to maintaining financial viability through market competition. Not unexpectedly, this attempt enabled us to affirm the need for more attention to the social perspective, doing justice to the distinctiveness and the societal outreach of the cooperative business form.

The present work, therefore, contributes to the literature on cooperatives, particularly to the academic inquiry of agricultural ones. It provides both new insights on the debate of cooperative performance measurement and a “currency matrix” (i.e., a performance dashboard serving as a medium of knowledge exchange) that balances the dual nature of cooperatives. In so doing, it invites scholars to use the “matrix” for future studies and, thereby, seek consensus on an array of performance metrics upon which to base empirical investigations henceforth. Equally, the proposed “matrix” will hopefully be useful for practitioners when conducting internal assessments or external reporting. Furthermore, even though the outcomes might not contribute to the current debates on sustainability measurement per se, they are relevant to scholars in the field of sustainability research. That is, sustainability researchers may benefit from the performance assessment analysis of an organizational form that is well (if not most) suited to contribute to sustainable development [5,6,8,14].

The remainder of the article is organized as follows: we first present the reasons why we placed a focus on agricultural cooperatives, the categorization which served as a basis for the proposed framework, and how the cross-fertilization with the literature on social enterprises can be fruitful. The methods applied to develop the comprehensive reviews and integrate the expert insights are described in the third section. In the fourth section, we document the list of identified metrics and present the results from expert interviews along the refined framework. We then integrate the key findings from the review on social enterprises and present the final framework. We round off the article with a discussion of the main findings and implications.

## 2. Theoretical Approach

### 2.1. Focus on Agricultural Cooperatives

According to the universally recognized definition established by the representative body for cooperatives, the International Co-operative Alliance (ICA, Brussels, Belgium), a cooperative is “an autonomous association of people united voluntarily to meet their common economic, social and cultural needs and aspirations through jointly-owned and democratically-controlled enterprises” [3,4,8]. So, people choose to meet their common needs (e.g., provision of food, banking, insurance, employment, housing) through several subtypes of cooperatives, such as worker, producer, retail, consumer, purchasing, financial, housing and social ones (see [10,20] for a detailed description). In effect, cooperatives are part and parcel of the people-centered ‘social economy’ (see [41]), and the only form of enterprise sharing internationally agreed principles (e.g., democratic member control, member economic participation) [3,14,36,37]. Not surprisingly, they are popular in many business sectors (e.g., banking, retailing, agriculture, social care), attending to more than a billion members all

over the world and concurrently addressing socio-economic challenges [6]. For instance, agricultural cooperatives help farmers to process and market their produce, financial cooperatives facilitate their members' access to financial capital, and consumer cooperatives make it possible for their members (and others) to access good quality household goods at affordable prices [2]. Stirred by cooperatives' widespread scope and appeal, we chose to review past work for all sectors and countries. However, we focused on agricultural cooperatives for three reasons.

First, cooperatives have a strong market presence in the agro-food economy worldwide. They are active in almost every country and well represented in both developed and emerging economies [3]. In 2015, the 20 largest agricultural cooperatives alone in 11 countries generated a turnover of \$273.02 billion, two of which were in India [20]. In the same year in the USA, 2047 agricultural cooperatives with 1.9 million members yielded a total gross business volume of \$212.1 billion [42]. In China as of the end of 2015, over 40% of farm households had become members of at least one cooperative [43]. In Europe, despite the country variation, the average market share of all agricultural cooperatives in European Union (EU, Brussels, Belgium) countries was estimated at 40% as of 2011 [44].

Secondly, the development of agricultural cooperatives has, as a matter of public policy, long been encouraged in several countries. In fact, in most market-oriented economies, agricultural cooperatives have received public support in various forms (e.g., discrete legal frameworks, exemption from antitrust laws, beneficial tax treatment, and technical assistance) [45]. In a recent EU-wide study, Bijman et al. [44] identified more than 300 specific policy measures at a European, national and regional level. Not unexpectedly, the cooperative form seems to be the "natural" legal form for farmers when organizing their shared business activities across Europe. Moreover, in developing countries and just between 1998 and 2011, the United States Agency for International Development (USAID, Washington, DC, USA) invested \$3.7 billion to assist agricultural cooperatives, acknowledging that producer groups can be an essential means of combating poverty, enhancing food security, and engendering inclusive employment [46].

Third, the importance of agricultural cooperatives has also been manifested by the marked attention they have received in academic literature [47]. A significant advance of theoretical work has taken place in the last decades [39,48–50], while studies on the performance of agricultural cooperatives have enjoyed a long empirical tradition [21,22,26]. Besides, three special issues in scientific journals have been dedicated to agricultural cooperatives just in the last five years [51–53]. The proliferation of research has been partly triggered by a seminal study commissioned in the mid-1980s by the United States Department of Agriculture [54]. This study also provided the definition which gained nearly universal endorsement by agricultural cooperative scholars and practitioners alike [53]. Dunn [55] popularized this definition, which is summarized as three general principles of use: 1. the user-owner principle, 2. the user-control principle, and 3. the user-benefits principle. In other words, those who own, finance and control the cooperative are those who use it, while the cooperative's core purpose is to provide and distribute benefits to its users on the basis of their use [44]. Consequently, compared to conventional organizational forms (e.g., IOFs), whose main aim is to maximize shareholders returns, agricultural cooperatives exist to provide benefits to member-producers. Likewise, as opposed to conventional organizational forms which are owned and controlled by outside shareholders who may not patronize the firm, agricultural cooperatives are uniquely owned and controlled by members who deliver their produce and/or buy inputs.

Taken together, the distinctiveness and significance of agricultural cooperatives in practical, policy and academic terms motivated us to place emphasis on them. Moreover, we assumed that to build a solid basis for a reliable and valuable dashboard, we had to zoom into the most well-studied and deep-rooted domain before embracing the diversity of cooperative subtypes. As a result, even though we considered studies in all sectors, we concentrated on the agricultural domain.

## 2.2. Preliminary Framework

As past systematic reviews (e.g., [21,22,56]) have pointed out, the empirical literature on cooperative performance has mainly focused on the cooperative organization as a separate firm. This reflects one of the three distinct schools of thought in the modern economic theory of cooperative organizations, which views the latter as an independent firm optimizing some objective function [50]. Enke [57] was the first to analyze the cooperative as a separate firm, while several other scholars ascribed to this line of research, each suggesting a different single objective that the cooperative (as a separate enterprise) would seek to maximize [39]. Empirical studies of cooperative performance mostly favored the profit-maximizing alternative, treating the cooperative firm as an IOF or an IOF-variant, albeit with different types of stockholders [21]. Not surprisingly, the empirical literature on cooperative performance has been dominated by two categories, with the first consisting of studies utilizing financial metrics, and the second comprising studies engaging in efficiency assessment [22].

We acknowledge that cooperatives have to meet mainstream corporate performance standards for the corporative body to survive (or thrive) as well as to continue delivering member and social benefits [58,59]. However, we attest to the view that success needs to be also appraised in terms of the benefits members receive as opposed to the performance of the cooperative alone [11,29,58,60–62]. Hence, in recognition of the dual nature of the cooperative organizational form, we prepared our preliminary framework along two broad categories. The first addresses more of the business nature of cooperatives and takes the organization as a unit of analysis. It is further divided into three sub-categories. The second broad category addresses the social-membership perspective, takes the member(s) as a unit of analysis, and is further divided into two sub-categories (see Table 1). The first two sub-categories, coded as “business financial appraisal” (BFA) and “business efficiency appraisal” (BEA) respectively, are similar to the dominant ones in the literature mentioned above. The third sub-category, coded as “subjective business appraisal” (SBA), relates to subjective and perceptual performance measures at an organizational level. As for the second set of sub-categories, the first one, coded as “objective membership appraisal” (OMA), is based on objective membership evaluations, while the second, coded as “subjective membership appraisal” (SMA), is based on subjective membership assessments.

**Table 1.** Preliminary framework overview.

Categories	Sub-Categories	Unit of Analysis
Business	<ul style="list-style-type: none"> <li>• Business financial appraisal (BFA)</li> <li>• Business efficiency appraisal (BEA)</li> <li>• Subjective business appraisal (SBA)</li> </ul>	The cooperative
Social-membership	<ul style="list-style-type: none"> <li>• Objective membership appraisal (OMA)</li> <li>• Subjective membership appraisal (SMA)</li> </ul>	The member(s)

### 2.2.1. Business Financial Appraisal (BFA)

BFA is grounded on financial (accounting) data typically found in a cooperative’s financial statement. Such data reflect the effect of corporate strategic decisions and is customarily used as an input in financial ratio analysis [60,62]. The latter is a standard technique of financial performance evaluation, conveying crucial information on an organization’s operations and financial situation [63]. The use in empirical cooperative studies is outstanding (e.g., [24,64–71]). Financial ratio analysis is used for comparative purposes too (e.g., industry-specific sector comparisons) [72,73]. Strikingly, a large body of work comparing the performance of cooperatives with that of IOFs in the same sector(s) (e.g., dairy, grain, farm supply) is present (e.g., [73–80]). Moreover, some studies (e.g., [81–83]) employ sales-based metrics (e.g., market shares, sales growth, the Lerner index) next to financial ratios to paint a more complete picture of financial measures and cooperative performance.

Examining financial data and utilizing ratios provides officials, members, and creditors with a glimpse of the cooperative’s strengths and weaknesses. In fact, financial measures have several

advantages in terms of collectability, scalability, level of objectivity, and comparability [69,84]. Perhaps their chief virtue is that they are replicated and benchmarked across all types of organizations [38]. However, there are some inherent problems associated with them, particularly with common ratios (e.g., profitability, liquidity, debt ratios). Some problems are intrinsic with the ratios themselves, and some are with the cooperative structure [70,85]. For instance, financial ratio analysis fails to consider that a cooperative can be seen as a vertically integrated entity including the members and their businesses [56] or to account for all of the financial effects of management decisions on the collective entity [86]. Also, traditional financial measures and analyses disregard the double role of members (i.e., users and owners) or that members are often paid above the market price for the products they supply to their cooperative [60,73,87]. Furthermore, neither financial measures nor ratio analyses account for the benefits of government support or the value of non-market benefits provided by the cooperative to members or the greater community [62,75]. Notwithstanding the drawbacks, financial measures remain primary in cooperative performance appraisal [22,70,88].

### 2.2.2. Business Efficiency Appraisal (BEA)

BEA is centered on production function data that is utilized for efficiency assessment and comparisons [89]. The term “efficiency” is used to describe the level of performance that can be reached by an economic unit in accordance with its production possibilities [90,91]. Economic efficiency, in particular, refers to a firm’s ability to convert inputs into outputs and respond optimally to economic signals (e.g., prices) [92]. The study of economic efficiency measurement has a longstanding tradition, triggered by the seminal work of Farrell [93]. Farrell identified economic efficiency on top of technical and allocative efficiency. Technical efficiency refers to the ability of a firm to produce the maximum feasible output from a given bundle of inputs (output-oriented) or produce a given level of output using the minimum feasible amounts of inputs (input-oriented) [94]. Allocative efficiency assumes knowledge of the price of the different employed inputs, in order to reach the optimum output at the lowest possible cost [95]. Technical and allocative efficiency, taken together, contribute to the overall economic efficiency of the firm [96]. If a firm is producing on the production frontier, using the optimal proportions of inputs given relative prices, the firm is said to be economically efficient [97].

As efficiency measurement techniques are based on economic theory, studies employing them often use input indicators for labor and capital, while for the output they commonly opt for turnover, sales or assets [88]. Depending on the different functions used (e.g., profit, cost), different efficiency variants might be favored (e.g., X-efficiency, cost efficiency, total factor productivity) [97,98]. Not unexpectedly, efficiency appraisal is rather popular in empirical cooperative studies (e.g., [91,94–96,99,100]), while quite a few compare the efficiency of cooperatives with that of IOFs in the same sector (e.g., [101–105]). Except for the various efficiency alternatives, in this sub-category, we also included other efficiency-related metrics commonly used in production or agricultural economics, such as scale and scope elasticities [106] or the comparative cost index [100].

It is notable that the greater accuracy of efficiency measures makes them an appealing alternative to ratio analysis [56]. Nonetheless, large data demands or confidential data (e.g., information on inputs and outputs) make these measures challenging to estimate [62,91]. The estimation becomes even more puzzling when multi-product and/or multifactor productive processes are examined [88]. Most importantly, as efficiency measures require an economic behavioral assumption (e.g., an objective of profit maximization or cost minimization) [92], extant studies view the cooperative as an independent firm with a single objective, neglecting to address the dual nature of the organization [21,27].

### 2.2.3. Subjective Business Appraisal (SBA)

SBA consists of measures relating to the judgmental assessment of internal or external respondents regarding an organization’s performance [107,108]. Studies using these measures rely on survey-based direct elicitation means, following in the tradition of management and marketing studies which regularly employ the key informant method, whereby respondents well informed about organizational

issues give answers to item statements [25,38]. These measures usually cover financial and other indicators (e.g., operational, social) and have only been used in a handful of empirical cooperative studies (e.g., [107,109–111]).

SBA measurement is often favored when objective data is difficult to obtain or insufficiently reliable [108]. SBA metrics facilitate the assessment of complex issues (e.g., expert's view on member satisfaction) [110,112] as well as that of non-financial or non-market aspects [60,109]. Moreover, SBA measurement enables cross-sectional analysis through sectors and markets in general, as performance can be quantified in comparison to objectives or competitors [38,107]. Despite their merits, SBA measures suffer from what their name suggests, namely a certain degree of subjectivity associated with psychological and cognitive biases [38]. In fact, SBA measurement might be plagued by common biases in behavioral research, like systematic error and common method variance [113], particularly when a single respondent provides answers across the survey instrument [114]. Finally, SBA studies might not accurately address the dual nature of the cooperative organization. That is, the indirect measurement of member perceptions only partially integrates the member perspective [25].

#### 2.2.4. Objective Membership Appraisal (OMA)

OMA encompasses metrics relating to observable membership characteristics [29,115,116], particularly with respect to user-benefit and user-control arrangements. More specifically, this sub-category relates to pricing, delivery, services, and governance data, like prices paid to members by the cooperative, the percentage of in-selling (or side-selling), the scope and quality of services members receive, and the governance systems and procedures (e.g., CEO tenure, secret ballots, audited accounts, available information to members). In agricultural cooperatives, this sub-category may additionally cover features commensurate with patronage and the members' farms [117–119], such as farm financial ratios, profits obtained, productivity, and efficiency. One of the reasons why farmers join cooperatives is that they routinely face considerable risk of income variability, often due to monopolistic exploitation (e.g., price discrimination) from upstream or downstream partners [31,39]. Consequently, success at the farm level is naturally also contingent on cooperative membership and can, thus, be partially estimated based on patronage-related data [120,121].

OMA metrics showcase what benefits members receive as well as to what extent members support their cooperative in return [122]. They are based on objective data and, if cooperative registries are present or if the cooperative statutes are readily available, OMA information can be directly sourced. In the absence of such sources as well as when farm-level data is sought, survey-based methods (e.g., structured questionnaires) are used instead [119], which often make the data collection process somewhat troublesome, as data access might condition the consent of cooperative officials or members themselves [116]. Moreover, OMA measures in isolation cannot truly address the dual nature of the cooperative organization; neither do they account for the performance of a cooperative as an entity nor reflect all member benefits (e.g., satisfaction with membership aspects). In reality, they do not integrate member perceptions, but rather member conduct, outward user-benefit or user-control arrangements, and farm performance.

#### 2.2.5. Subjective Membership Appraisal (SMA)

SMA comprises measures relating to the judgmental assessment of cooperative members regarding the benefits they receive from membership and their cooperative's performance in general [123,124]. These measures habitually cover members' general stance towards the cooperative (e.g., overall satisfaction, intention to continue membership) [125,126], members' evaluation of financial aspects (e.g., satisfaction with price or market arrangements) [29,127], and members' evaluation of non-monetary membership aspects (e.g., members' influence on internal decision-making, satisfaction with information flow) [123,128]. In the vast majority of the few empirical cooperative studies that rely on SMA measures (e.g., [125,126,129]), multi-item scales are commonly favored. The latter are

usually drawn from constructs developed and validated in mainstream marketing or management studies [127,130].

SMA measures facilitate the direct assessment of member benefits, unveiling how members think and feel towards their cooperative or even how they might behave in the future [123]. Also, SMA measures can capture non-pecuniary and non-market aspects of cooperative behavior [124]. Nevertheless, SMA data might be difficult or time-consuming to obtain, as it requires the consent and willingness of members to participate in field work, which might be challenging for producers or members of advanced age [126]. Moreover, similar to SBA metrics, SMA measurement might suffer from cognitive and psychological biases [38,113]. Finally, SMA measures alone cannot address the dual objective nature of the cooperative organization, as they do not account for the latter's performance as an entity. Members' benefits are naturally conditioned by the cooperative's achievements [112], so SMA metrics might mainly be reflecting rather than assessing organizational performance.

### 2.3. The Cross-Fertilization Potential with Social Enterprises

Social entrepreneurship is a way of addressing societal needs through the utilization of economically sustainable market strategies [131,132]. Social enterprises are social mission-driven organizations that trade in goods or services for a social purpose [133,134]. They are typically positioned between profit and non-profit organizations [135]. On the one hand, they differ from the former (hence also IOFs) as profit is a means to create social value rather than an end per se. On the other hand, they present an alternative to non-profit models which are naturally dependent on grants and donations [136]. In the past couple of decades, social enterprises have attracted considerable practical and scholarly interest [137,138], even though they belong to a relatively nascent area of research [139]. The growing interest in them is consistent with the mounting pressure on business organizations to spur positive social change by engaging in social or environmental initiatives [140].

So, social enterprises have a propensity to blend for-profit practices with non-profit ones, although they are neither typical charities nor traditional businesses like IOFs [141]. Of course, to address their core mission and, thus, optimize the creation and distribution of social value, they have to forego financial returns or reinvest them [132,142]. Combining business and social goals, they form part of the so-called 'social economy sector' which consists of those organizations that do not belong to the public and private sectors, like non-profit associations, mutual societies, and cooperatives [41,131]. In fact, social enterprises are considered hybrid organizations whose defining characteristic is the duality of social impact alongside financial sustainability [134,136,139]. Together with cooperatives, whose hybrid identity is inherent [35], they consistently demonstrate how to thrive as hybrid organizations attending to competing business–social demands [137,143].

Admittedly, social enterprises and cooperatives have many commonalities. They both have to be business-like and meet financial and commercial goals on top of their social ends [144]. They are both seen as promising vehicles for the creation of social and commercial value, as through their business ventures they offer a ray of hope in a world filled with longstanding socioeconomic and environmental issues [9,136,137]. Similar to cooperatives who fill provision gaps [2,35,39], particularly in disadvantaged areas, social enterprises help those left behind and serve markets habitually underserved by IOFs or governments [139,145]. Actually, both social enterprises and cooperatives have a potential to be architects and the engine of genuine social innovation [131], principally through the creation of business–social networks necessary to stimulate social change [36,132].

By the same token, cooperatives and social enterprises face a number of common challenges. First of all, the commercial activity of social enterprises might reduce their attention to the social mission [142], similarly to cooperatives, where business emphasis increasingly tempers their social character [37]. In other words, in their efforts to generate revenue, social enterprises run the risk of losing sight of their social missions, subjecting themselves to mission drift distress [132,139,140]. This concern echoes one of the profound trends in the social economy sector, namely steady rationalization and marketization [142,144,146]. In cooperatives, this trend has resulted in governance

changes (e.g., reduced member involvement) [34], and a social capital drain [33]. In addition, focusing on both social and economic outcomes sets the stage for various forms of organizational tension (e.g., belonging, performing) [137], perplexing performance measurement too [147]. Performing tensions emerge from the divergent outcomes social enterprises deal with, such as the varied goals they need to set, the different metrics they have to employ, or even the inconsistent stakeholder demands they are compelled to satisfy [134]. For example, as performance evaluation extends to both social and financial operations [133], it is hard to sustain support for both social and financial metrics [137]. Undoubtedly, pecuniary indicators are crucial for evaluating sustainable organizational progress, yet, assessing the non-financial performance is arguably equally important to ensure the core mission is met [135,148]. Considering that cooperatives are also confronted with similar performing tensions and, given the commonalities identified [147], it seems instrumental to investigate how literature on social enterprises has tackled the complex issue of performance assessment and, thereby, inform the inquiry for cooperative organizations.

### 3. Materials and Methods

To reach the objective of our study, we divided our research process into three phases. In the first phase, our aim was to obtain an overview of relevant performance indicators and prepare the preliminary categorization detailed above. Therefore, we performed an extensive literature review and delimited the material according to the topic of the present article. In the second phase, our aim was to screen the sub-categories of the first phase and decide upon an acceptable dashboard. We used the Delphi technique to seek convergence on opinions from domain experts. In the third phase, we performed a literature review on the performance of social enterprises. We aimed at comparing the performance dashboard with research efforts for social enterprises and informing it with potentially overlooked or complementary indicators. Table 2 gives an overview of the three phases of the research process.

**Table 2.** Overview of the different phases of the research process.

Research Process	Aims
Phase 1: Literature review on the performance of cooperatives	<ul style="list-style-type: none"> <li>• Confirm performance sub-categories</li> <li>• Identify performance indicators</li> </ul>
Phase 2: Delphi panel with cooperative experts	<ul style="list-style-type: none"> <li>• Validate performance sub-categories</li> <li>• Reach consensus on a dashboard of indicators</li> </ul>
Phase 3: Literature review on the performance of social enterprises	<ul style="list-style-type: none"> <li>• Analogies with cooperatives</li> <li>• Identify complementary indicators</li> </ul>

#### 3.1. Phase 1

In phase 1, we followed review procedures drawn from scholarly work on performance and sustainability measurement research [13,16,17]. We only considered contemporary research, demarcated as scholarly and practitioner efforts involving performance measurement frameworks or metrics since 1980. To derive an initial population of articles, we conducted electronic keyword searches in major bibliographic databases, such as “AgEcon”, “JSTOR”, “Web of Science”, “ScienceDirect”, “WorldCat”, “EBSCOhost”, “Scopus”, and “Academic Search Premier”. Three of the authors and three experts on the topic (i.e., in terms of numbers of studies conducted, papers published and reviewed, and familiarity with specific journals covering cooperative research) developed the keyword search strings, namely “performance measurement”, “performance appraisal”, “performance evaluation”, “performance assessment”, “efficiency”, “cooperatives”, and “credit unions”. To expedite the identification of relevant journal papers, we restricted our focus on the articles that included one or more of the search terms in the title, abstract or keywords, along with the term “cooperatives” or

“credit unions”. We also consulted “Google Scholar” and, thus, conference proceedings, industry briefs, and policy reports were reviewed too, provided that the publication was in English and under the auspices of a well-established organization (e.g., USDA, Washington, DC, USA) or association (e.g., the Agricultural and Applied Economics Association—AAEA, Milwaukee, WI, USA). Finally, we detected overlooked sources with the aid of the three experts. Our extensive investigation revealed a notable array of research over the last decades. Each document was then examined to classify only those that contained an explicit performance framework or metric(s) for cooperative organizations. All documents were double-coded by two of the authors as well as another coder with experience in cooperative and organizational research.

### 3.2. Phase 2

In phase 2, we employed the Delphi method. This is a popular technique used for the solicitation and aggregation of informed judgments from experts within specific topic areas, developed by the Research AND Development (RAND) Corporation in the 1950s and 60s [149–151]. In effect, it is a systematic process that seeks to achieve convergence on real-world opinions from a group of experts on certain (research) question(s) [152,153]. Opinions are gathered through multiple survey rounds, allowing and encouraging the selected experts to reassess judgments provided in previous iterations [154]. So, in each round, the participants are asked to answer questions individually and anonymously, while, after each round, responses are statistically summarized and reported back to them, giving them the chance to revise their answers [149,152]. As a result, every iteration forms the foundation for the next, and the process, which is guided by a skilled moderator, continues until a consensus or a set level of stability in answers is reached [153]. As the anonymity of contributors is maintained, and their feedback is monitored throughout the process, the Delphi method prevents groupthink, minimizes the influence of dominant individuals, and reduces (statistical) noise [149,150]. Not surprisingly, since its inception by Dalkey and Helmer [152], it has enjoyed a long tradition as a research and management decision tool [151], even though it has hardly been used in cooperative studies (see [154] for an application).

As the Delphi technique does not make use of a random sample of the target population [152,153], we applied a purposive sampling method, identifying potential participants through publications, personal contacts, peer recommendations, research conference lists (e.g., ICA global conferences), and affiliations with organizations active in the field of cooperatives (e.g., research institutes, non-governmental organizations, consultancy firms). To reflect the variety of geographic contexts in cooperative performance research (see Section 4.1 below) and to ascertain that responses represented various possible standpoints (e.g., academic, practical, policy)—in line with the past application of the Delphi method in cooperatives (i.e., [154])—we collected expert judgments from a diverse panel. So, to assemble the panel and ensure diversity, the final list of experts was stratified according to sectors (e.g., public, private, and not-for-profit), geographic regions, gender, and field of cooperative expertise. An e-mail invitation was sent to 42 experts, along with a cover letter containing a short description of the Delphi process, a proposed timeline, and a brief outline of the research objectives. After a reminder e-mail, 17 experts agreed to join the panel. The final pool of panelists included 11 males and 6 females. Although most of them ( $N = 8$ ) came from North America, they were somewhat geographically dispersed: four were Europeans, three were from Latin America, and two from Africa. Seven panelists were academics (e.g., University faculty members), three were senior managers at consulting firms (e.g., agribusiness consultants), three were officials at governmental organizations (e.g., USDA), two were senior managers of not-for-profit organizations (e.g., development organizations), and two were executives of financial institutions (e.g., a credit union). The majority ( $N = 10$ ) of panelists held a doctoral degree, and all of them had experience in the topic of cooperative performance on top of a proven track record of cooperative expertise (e.g., significant research output, extensive advisory work).

The actual Delphi study was implemented online, in three rounds. In all iterations, communication was standardized, safeguarding that all panel members received identical information. To reduce

over-confidence bias, we also asked experts to report their degree of familiarity with the overarching topic. In round 1, we administered an online survey asking the experts to screen and validate the performance sub-categories confirmed in phase 1 as well as select which ones they would use for measuring cooperative performance along three criteria (i.e., ease of data collection, usefulness, and applicability across contexts). In addition, the most common indicators for each sub-category identified in phase 1 were given as examples, while participants could also suggest new metrics or even new sub-categories. In this round, we used the “average percent of majority opinions” (APMO) cut off rate as a consensus measure [150]. Based on the latter, responses were summarized and sent back to participants for review in round 2. Through discussion and revision, a consensus was reached by narrowing the survey to three sub-categories and eight indicators that served as the content for the round 3 survey tool. In round 3, four participants decided to drop out, and the remaining 14 were asked to determine the suitability of the eight indicators on a 5-point Likert scale. Levels of agreement among participants were determined using simple measures of central tendency as a consensus criterion [153]. In this round, a general consensus was reached and, thus, we decided to stop further deliberations.

### 3.3. Phase 3

Even though the past decade has witnessed a surge of scholarly interest in social entrepreneurship and social enterprises, it was not until the same decade that such research became an influential literature stream [137,138]. Hence, before conducting the review on the performance of social enterprises, we could expect that perhaps the sheer number of works devoted to the topic at hand would be smaller than that anticipated for cooperatives. Considering that social enterprises were not the focal business form of this article, we restricted ourselves to including peer-reviewed articles (in English) that specifically and explicitly stated social enterprises as their main research topic. So, we consulted the same databases as in phase 1 (with one exception) and searched for articles containing the terms “social enterprise” or “social venture” in the title, abstract, or keywords, along with the terms “performance measurement”, “performance appraisal”, “performance assessment”, “performance evaluation”, and “efficiency”. All documents were double-coded by two of the authors.

## 4. Results

### 4.1. Phase 1

Our review resulted in a sample of 139 empirical works (i.e., 121 journal articles, eight conference proceedings, six book chapters, and four reports) and four guides. The vast majority of the empirical studies examined agricultural sectors (i.e.,  $\approx 85\%$ ), a few more than 15% related to retail banking, and less than 5% investigated other sectors (e.g., industrial, consumer). A third of the studies focused on the United States (USA), a bit more than a third (i.e., 37%) considered European countries, and the rest centered on countries from Asia (e.g., India, Japan, China), Africa (e.g., Ethiopia, Kenya), Latin America (e.g., Brazil, Costa Rica), and Australia or Canada. Interestingly, most research drew samples from the dairy sector (29%), followed by the grain sector (25%), farm supply (25%), and fruit and vegetables (21%). Moreover, almost 20% of studies compared cooperatives with IOFs, with the rest focusing solely on cooperatives or cooperative members. In Table A1 in Appendix A, we present all studies across the sample profile (e.g., country, data period, number of cooperatives) and sector(s). Of course, we also present the sub-categories in which each study was classified next to the metrics employed. In addition, at the bottom of Table A1, we present the metrics proposed by the four guides, the sub-categories these metrics belong to, as well as the countries and sectors to which they are applicable or have been designed for. Table 3 below provides a summary overview of all the reviewed work (i.e., both the empirical studies and the guides) across the five sub-categories of the preliminary framework.

**Table 3.** Summary overview of the empirical studies on cooperative performance.

Sub-Categories	% of Studies <sup>1</sup>	Most Commonly Reported Metrics
Business financial appraisal (BFA)	58.04	Profitability, debt, liquidity, and efficiency ratios
Business efficiency appraisal (BEA)	30.07	Technical and allocative efficiency
Subjective business appraisal (SBA)	7.69	Key informants' perceptions about overall performance and performance aspects (e.g., member satisfaction)
Objective membership appraisal (OMA)	14.00	Prices paid, side-selling
Subjective membership appraisal (SMA)	9.79	Members' satisfaction with the cooperative, members' intention to continue/loyalty

<sup>1</sup> The total % is not equal to 100, as many studies were assigned to more than one sub-category.

Tables 3 and A1 reveal that the largest number of empirical studies (i.e., 58%) could be classified as BFA. Unsurprisingly, some studies utilized sales-based metrics (e.g., market shares, sales growth), but the overwhelming majority used financial ratios. The latter could be further divided into two main sets. The first consists of profitability and efficiency ratios illustrating the ability of equity capital to generate returns as well as indicating how effectively assets are utilized [74,86]. The second set, which contains leverage, solvency, and liquidity ratios, concentrates on metrics that show the nature of financing equity capital and the ability of the cooperative to pay its debts in the long run (i.e., solvency, leverage) or to meet its short-term obligations out of liquid assets (i.e., liquidity) [63,155]. Moreover, a few studies (e.g., [67,82,156]) employed export-oriented ratios, such as the export intensity ratio (i.e., export to total sales) or the degree of internationalization ratio (i.e., foreign sales to total sales). Finally, many studies devoted to retail banking (e.g., [157–160]) made use of banking-specific ratios like the loan ratio, often on top of examining the traditional ones.

The sub-category also recurring quite often in the literature was that of BEA. Notably, almost every third article entailed efficiency assessment metrics. As expected, most contributions favored technical and allocative efficiency, but different efficiency variants were also used (e.g., cost efficiency, scale efficiency, total factor productivity). Furthermore, as explained in Section 2.2.2., in the BEA classification, other efficiency-related metrics could be located, such as the marketing margin per unit of capacity [161] or the comparative cost index [100].

In contrast to the BFA and BEA sub-categories, the attention on the remaining three has been somewhat skewed. Except for an early application from Babb and Boynton [87], it was not until the last decade that SBA, OMA, and SMA metrics were first employed (e.g., [29,107]). In fact, their use only proliferated in the past five years or so, even though some metrics (e.g., satisfaction, perceived performance by key informants) were drawn from mainstream management or marketing studies, the domain of which has exemplified a decades-long tradition in such use [38]. In total, all three sub-categories accounted for not more than one-fourth of all reviewed studies. In the SBA sub-category, the most common metric adopted related to key informants' (e.g., CEO, board chair) perceptions about overall performance or performance aspects (e.g., how satisfied members are). In the OMA sub-category, the whole range of observable membership characteristics identified in the preliminary framework could be spotted, from user-benefit arrangements (e.g., prices paid, quality of services) or user-control features (e.g., governance procedures) to patronage-related data (e.g., farm profitability). Yet, side-selling appeared to be the most commonly reported measure. The SMA sub-category was dominated by metrics related to overall member satisfaction or satisfaction with membership aspects (e.g., technical assistance, pricing policies, information flow), followed by loyalty measures (e.g., intention to continue membership).

Finally, a handful of papers (e.g., [7,146,147]) also included metrics not directly belonging to any of the five sub-categories but rather concerning the environmental performance or the impact on internal (e.g., employees) and external stakeholders (e.g., the community), such as the employment size and the community payments ratio (i.e., community expenditure to total assets). On the contrary,

the four performance guides (i.e., [19,162–164]) propose a considerable amount of metrics relating to social or environmental value, such as indicators for community involvement and development (e.g., amounts granted for donations, scholarships and sponsorships), employee benefits (e.g., salaries, training, hiring practices), and environmental impact measures (e.g., emission and waste reduction). Similarly, all of the guides elaborate on the OMA sub-category, highlighting the social-membership perspective and the importance of capturing member benefits.

#### 4.2. Phase 2

In round 1, respondents were given three weeks to complete the online survey. As pointed out in Section 3.2., experts were first asked to assess their familiarity with cooperative metrics on a 7-point Likert scale, partly as a means of curbing over-confidence bias. It turned out that the panelists rated themselves high on average ( $M = 5.71$ ,  $S.D. = 1.16$ ), albeit at a reasonable rate. They were then asked to answer how “easy it is to collect data for the <<sub-category>>”, how “useful is the <<sub-category>>” and how “applicable is the <<sub-category>> across contexts”.

Respondents could answer whether they agreed or disagreed, generating a potential maximum set of 255 responses. To determine the level of consensus for these responses, we applied the APMO method (see [150] for an overview). This is expressed as:

$$\text{APMO} = [(\text{majority agreements} + \text{majority disagreements}) / \text{total opinions expressed}] \times 100\%$$

According to this method, a statement must achieve a percentage for “agreement” or “disagreement” that is higher than the APMO cut-off rate. The latter is calculated as follows: first, the number of majority agreements and disagreements is computed by expressing the participants’ answers in percentages per statement. A majority is defined as a percentage above 50%. Second, the majority “agreements” and “disagreements” are summed up. Third, these sums are divided by the total number of opinions expressed to calculate the APMO cut-off rate. Any item below the cut-off rate may enter round 2 for re-evaluation.

To calculate the APMO rate for the first round, we used the 15 statements generated by the three questions presented above (five sub-categories multiplied by three questions). So, 113 majority agreements plus 50 majority disagreements (only those >50% are summed) were divided by the total of 252 opinions. This resulted in an APMO rate of 64.68%. As we can see in Table 4, nine statements during the first round reached a percentage of (dis)agreement that was higher than 64.68%, and thus reached a consensus. More specifically, a consensus was fully reached for the SMA sub-category. A consensus was also partly reached for the BFA and OMA sub-categories, in two out of three criteria. That is, the panelists could not clearly agree or disagree if it is easy to collect data for BFA and OMA. In contrast, they did agree that data collection is not easy for BEA. They could not reach a consensus for BEA along the other two criteria, however. Likewise, no consensus was reached for SBA along any of the three criteria.

In round 2, the panelists reached an agreement regarding the contested cases of the first round. That is, after being sent the summarized responses and through discussion, they decided that the SBA and BEA sub-categories should be eliminated (see Table 5). They did retain the BFA and OMA ones, acknowledging that data collection is not easy but definitely easier than for the eliminated sub-categories. Furthermore, in this round, the panelists agreed to carry on with the most common indicators identified for BFA, OMA, and SMA (see below). Finally, no new sub-category was put forward in any of the first two rounds, while the few additional metrics suggested by experts were already identified in phase 1.

**Table 4.** Analysis of answers to first round statements and consensus.

Statements <sup>1</sup>	Agreed	%	Disagreed	%	Undecided	Opinions	Consensus
BFA_e	10	58.82	7	41.18	0	17	No
BEA_e	4	23.53	13	76.47	0	17	Yes
SBA_e	8	50.00	8	50.00	1	16	No
OMA_e	12	70.59	5	29.41	0	17	No
SMA_e	7	41.18	10	58.82	0	17	Yes
BFA_u	13	76.47	4	23.53	0	17	Yes
BEA_u	11	64.71	6	35.29	0	17	Yes
SBA_u	7	43.75	9	56.25	1	16	No
OMA_u	15	88.24	2	11.76	0	17	Yes
SMA_u	13	76.47	4	23.53	0	17	Yes
BFA_a	14	82.35	3	17.65	0	17	Yes
BEA_a	8	47.06	9	52.94	0	17	No
SBA_a	7	43.75	9	56.25	1	16	No
OMA_a	13	76.47	4	23.53	0	17	Yes
SMA_a	12	70.59	5	29.41	0	17	Yes
Total	113	-	50	-	-	252	-

<sup>1</sup> The suffix “\_e” stands for “ease of data collection” (question 1), the suffix “\_u” stands for “usefulness” (question 2), and the suffix “\_a” stands for “applicability across contexts” (question 3).

**Table 5.** Round 2 decisions.

Sub-Categories	Keep the Sub-Category <sup>1</sup>	Drop the Sub-Category <sup>2</sup>
BFA	15	2
BEA	5	12
SBA	5	12
OMA	12	5
SMA	13	4

<sup>1</sup> Number of experts deciding that the <<sub-category>> should be kept; <sup>2</sup> Number of experts deciding that the <<sub-category>> should be dropped.

In round 3, three experts decided not to continue. The rest were asked to rate the eight metrics approved from the previous round. To determine the consensus level, we used the mean as an orientation criterion and the standard deviation (SD) as a level criterion. SD values below 1 were deemed as “high” [153]. As we can see in Table 6, but for two metrics, all other reached a high level of consensus. In fact, the two metrics that failed to do so appeared to have the lowest means too. Of course, one of the BFA metrics (i.e., profitability ratios) only marginally fulfilled the consensus level criterion. All in all, shortly after gathering and analyzing round 3 responses, we reckoned that phase 2 objectives were met and, thus, decided not to proceed to a fourth round.

**Table 6.** Summary of results for the Delphi third round.

Metric	Mean	SD	Median	Consensus Level
Profitability ratios	3.93	0.99	4.00	High
Debt ratios <sup>1</sup>	4.21	0.80	4.50	High
Liquidity ratios	4.21	0.89	4.00	High
Efficiency ratios	4.00	0.88	4.00	High
Prices paid	3.86	1.17	4.00	Fair
Side-selling	4.64	0.63	5.00	High
Member satisfaction	4.64	0.50	5.00	High
Intention to continue/Loyalty	3.50	1.23	4.00	Fair

<sup>1</sup> In debt ratios, both leverage and solvency ratios were included.

### 4.3. Phase 3

As expected, our review of the literature on the performance of social enterprises confirmed that approaches to measuring performance within social enterprises remain in the early stages [136]. Not surprisingly, the sheer number of articles measuring or merely conceptualizing performance in social enterprises compared to the volume we generated in our review of the empirical work on cooperatives was somewhat small (see Table A2 in Appendix B). Moreover, we found no study focused on the agricultural sector. Of course, as social enterprises use a business logic to improve the situation of population segments that are disadvantaged or even excluded [138], it should not be surprising that almost all reviewed studies were devoted to socially-oriented sectors, such as those of work integration and social care. Interestingly, quite a few studies (e.g., [133,135,141,165,166]) included cooperatives in their samples and treated them as social enterprises. Perhaps, as numerous social cooperatives providing socially-oriented services (e.g., work integration, healthcare) can be found in many countries [147], such identification with social enterprises can be anticipated, although it should be avoided.

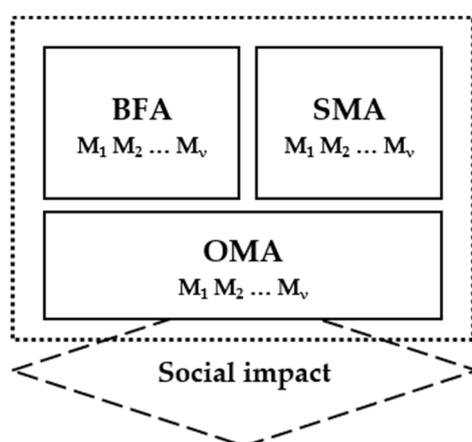
As far as metrics are concerned, early work concentrated on adaptations of Kaplan and Norton's [167] balanced scorecard, deploying strategic objectives into operational ones in order to determine how social value is created [168]. A handful of studies appealed on financial data, in line with BFA metrics, while others used or developed subjective measures (e.g., key informant's view on economic and social performance), which in turn could be directly compared to SBA metrics. Not unexpectedly, all studies used some indicators designed to capture social value (e.g., social performance), even though almost all of the studies recognized the challenge of assessing it as opposed to financial performance. Still, two models that concentrate on social value but also blend it with economic inputs and outputs clearly prevailed.

The first one is the social return on investment (SROI) and is part of the synthetic type of metrics, which aim to provide a global performance assessment of a social organization [148]. The SROI model was developed by the Roberts Enterprise Development Fund and is based upon the principles of cost-benefit analysis [141]. By analogy with its business counterpart (i.e., the return on investment), it measures the value of social benefits created by an organization in relation to the cost of achieving those benefits [148]. In other words, it is a measure that monetizes outcomes, comparing the (monetized) social costs of a program with the (monetized) social benefits of achieving an outcome [169]. As a synthetic indicator, the SROI model seeks to merge financial and social value with a view to formulating a single parameter representing the social enterprise's performance [145]. Similarly to the second dominant model (i.e., the "logic model") below, it puts those affected (i.e., the beneficiaries) at the heart of the measurement process [170].

The second model is based on the so-called "logic model" of assessment (or impact value chain model), a process-based model centering on the process of 'production' of a social service/product [168]. The "logic model" was originally developed for USAID in the late 1960s and has its roots in the evaluation of programs and projects [171]. It articulates indicators and metrics into inputs, outputs, outcomes, and impacts [145]. Organizational inputs (e.g., equipment, funds) are used to support activities or processes for the production of goods and services that in turn result in the delivery of outputs to a target beneficiary population (e.g., number of people benefitting) [142]. These short-term outputs are expected to lead to improved outcomes in the lives of beneficiaries typically measured in terms of medium- and long-term benefits (e.g., increased incomes, social integration) [171]. The component of impact usually refers to the consequences for the wider community, acknowledging the secondary effects that may accompany the outcomes (e.g., community benefit due to social integration) [133]. In short, the "logic model" and its variants used by the studies at hand are centered on the beneficiaries, but implications for the wider community are often integrated, even though the causal link between outcomes and impact might not be apparent or go beyond the control of the social enterprise in question [135].

#### 4.4. The 'Currency Matrix'

In harnessing the “currency matrix” for the performance measurement of cooperatives, we “amalgamate” the findings from the three phases in a concrete dashboard, even though we do not narrow down the scope to the exact metrics singled out in the Delphi study. In phase 1, it became clear that, despite the dominance of the business sub-categories (i.e., BFA and BEA), the social-membership perspective, represented by OMA and SMA, has entered the lexicon of empirical research in cooperative performance and is gaining increasing attention. Yet, any performance assessment endeavor cannot afford to disregard the business perspective, particularly the BFA metrics that apply to cooperative and non-cooperative contexts alike. Moreover, phase 1 findings suggested that hardly any efforts are made to empirically assess cooperative impact beyond cooperative boundaries (e.g., benefits to the community). In phase 2, cooperative experts helped to “hammer” the assessment components and imprint them into a three sub-category dashboard. As we can see in Figure 1, the BFA element reflects the business aspects, and the SMA constituent conveys the social-membership viewpoint. Together, they do justice to the dual objective of the unique cooperative organizational form. However, the OMA addition solidifies both components, exemplifying in observable terms what members receive but also what they partly contribute to keeping their cooperative enterprise in business.



**Figure 1.** The suggested dashboard/“currency matrix”.

Consequently, even though integrating measures from BFA and SMA would probably suffice to obtain a firm view on cooperative performance, complementing them with OMA metrics helps paint a complete picture. Additionally, users may employ the metrics that comprise each constituent ( $M_1, M_2 \dots M_v$  in Figure 1) depending on their context characteristics. Interestingly, in phase 3, it became evident that the social aspect takes center stage in the scholarly work on the performance of social enterprises. Emphasis is placed on the beneficiaries, but societal implications beyond the recipients' frontiers are accounted for or at least considered. In phase 1, only the performance guides concentrate on social aspects. Hence, phase 3 findings and the limited attention of phase 1 results suggest that the ground for the social perspective—in membership terms and beyond—is undoubtedly fertile for a genuinely socially-embedded business form like cooperatives, particularly when attempting to unveil their actual socio-economic impact.

Finally, the three sub-categories are glued to each other. Even though they are based on distinct metrics and are ostensibly independent, they are essentially interdependent. Yet, they should not be treated as an all-inclusive index, and they cannot probably result in a single supreme indicator. Preferably, together they epitomize a “form for a medium of knowledge exchange” (the “currency matrix”). This medium enables “users” (researchers or practitioners) to pick the “exact units” (metrics) that generate “global values” (scores) that ultimately empower them to “trade” (exchange) their findings in the knowledge “marketplace”. If the “currency matrix” is duly utilized, findings on cooperative performance may become easily “interchangeable” rather than risk ending up isolated.

Moreover, as the three sub-categories are fundamentally symbiotic with the social impact aspect, adding social value measurement elements opens up the exchange of ideas or results past the cooperative “universe”. As a result, we anticipate that studies employing metrics from all three components as well as assessing social impact will be in a better position to capture cooperative performance comprehensively and at the same time produce a fruitful dialogue.

## 5. Discussion

In this paper, we aimed at delivering a performance dashboard for cooperatives that could be comprehensive and simultaneously consistent with the dual nature of the distinctive cooperative organizational form. In so doing, we began with an analysis of a preliminary framework, in which we detailed five sub-categories and documented their advantages and shortcomings. Then, in phase 1 we reviewed an impressive body of empirical work and validated the preliminary framework. In phase 2, we integrated the input from experts in the field, and through multiple iterations transformed the framework into a concrete three-sub-category dashboard. In phase 3, we explored comparable work for a business form (i.e., social enterprises) that also straddles business with social components and faces similar business–social challenges. This inquiry encouraged us to fortify the social perspective of the dashboard. Moreover, based on what has been most commonly used in the literature as well as on what the experts singled out, we proffered a manageable bundle of metrics for each of the three sub-categories, even though neither did we aim to prepare a global performance measure nor to direct future work into particular metrics. Instead, our dashboard covers the assessment constituents that can be considered representative of the cooperative organizational form and fundamental for measurement endeavors. Hence, it may serve as a common benchmark (a “currency matrix”) for future empirical studies or at least trigger more inquiries that look into both the business and social perspectives.

Our finding that studies have only recently paid attention to the social perspective coupled with the absence of impact assessment beyond the cooperative boundaries, in sharp contrast to research on social enterprises, warrants further investigation. It is already surprising that cooperatives have been unable to disseminate their competence in creating both commercial and social value, particularly in light of the estimation of the International Labour Organization (ILO) that the livelihoods of nearly half the world’s population are secured by cooperatives [6] or despite the annual reporting by the World Cooperative Monitor [20]. Therefore, we suggest that future research accommodates the assessment of far-reaching social impact too. Perhaps, when scholars and practitioners consider what to assess or what to report, they should embrace the quote from Pericles: “What you leave behind is not what is engraved in stone monuments, but what is woven into the lives of others”. In other words, cooperatives will be in a better position to demonstrate they are an effective tool for the sustainable social development if cooperative scholars and managers engage in systematic evaluation of social value too [40].

A central strength but also limitation of this study is the focus on the agricultural domain. At the outset of the paper, we explained that we chose to concentrate on this domain, given the robust market presence agricultural cooperatives exhibit worldwide, the policy support they enjoy in several countries, and the marked attention they have attracted in the specialized academic literature. In reality, we did consider all sectors and reviewed related work, but, not unexpectedly, we found that almost 85% of the 139 empirical studies at hand were entirely or partly devoted to agricultural cooperatives. We acknowledge, however, that future studies may not be in a position to pick certain metrics out of those proffered (e.g., side-selling). A solution for researchers would be to favor the sub-categories of the proposed dashboard, albeit select or adapt those metrics that suit their contexts. For example, in phase 1 we showed that some studies which examined retail banking cooperatives employed banking-specific financial ratios. So, we could suggest that, regardless of the subtype (e.g., consumer, purchasing, financial, housing), researchers could utilize the “matrix” to assess performance, as long as they make the right metric selections and the right adaptations. We expect that the OMA sub-category would probably call for particular attention (e.g., the metric “prices paid”

would need careful interpretation), whereas the BFA and SMA sub-categories would require less effort. For example, measuring “member satisfaction” across subtypes or calculating financial ratios would be a relatively uncomplicated undertaking.

Similarly, as Franken and Cook [27] have pointed out, the correspondence between different metrics might be contingent on the type of the cooperative (e.g., multipurpose vs. supply), which in turn might be bound to the sector(s) (e.g., dairy vs. grain) that the sample in question is associated with. More research is definitely needed to explore a better alignment between the different contexts and the various metrics, also in line with the calls from mainstream management research [16,38]. Moreover, following sustainability studies’ convention to treat stakeholders as an integral part of the measurement process [13], future research could more systematically involve internal and external stakeholders in the cooperative performance assessment process and, thereby, develop a taxonomy of (apt) metrics by stakeholder type. Of course, as the core stakeholders (i.e., the members) routinely exhibit substantial heterogeneity in their preferences [30], it is rather perplexing to satisfy their interests, let alone to balance the diverse concerns of the varied stakeholders. Nonetheless, accounting for the inherent heterogeneity in stakeholder preferences when measuring cooperative performance, will permit a richer understanding of cooperatives’ socio-economic impact on top of expediting a dynamic configuration between research contexts and metrics.

Furthermore, it could be promising to examine our suggested dashboard and different metrics through the prism of the cooperative life-cycle framework [172,173]. The latter encapsulates the business and social perspectives, among others, and assesses cooperative “health” over five sequenced phases through a bundle of metrics (e.g., prices paid, services, feeling of community) that tie finely with our dashboard. Perhaps deploying the dashboard constituents and associated metrics along the five phases would help researchers to interpret performance outcomes more accurately and understand the interconnections between the constituents for each phase soundly. In practice, coalescing our dashboard with the life-cycle framework could probably assist cooperative leaders in making informed decisions, particularly in the final phase, where they have to make a “choice” that determines whether their cooperative can go through succeeding life cycles.

In conclusion, while we believe we have succeeded in providing academics and practitioners with a “currency matrix” of cooperative performance measurement to rely on, we see an opportunity for scholars to advance the performance debate and possibly provide a concluding touch, as long as they do not disregard the (dual) nature and the (social) roots of the idiosyncratic cooperative organizational form. We hope we have made a small step toward convergence in understanding cooperative performance assessment and in facilitating future scientific comparisons. Cooperatives are well-placed to contribute to sustainable development, although, to render their contribution visible universally, they first need to be well-equipped to quantify their impact consistently.

**Author Contributions:** All of the authors contributed substantially to the conception of the paper, and jointly defined the methodology and delimitations of the study. T.B. also contributed by preparing the background research, performing the reviews and the data analysis, as well as drafting the manuscript. N.K. also contributed by acquiring and preparing the data, providing analysis and interpretation, and conducting critical revision. M.W., K.d.R., and J.M.E.P. also contributed by editing and critically reviewing the work. Finally, all of the authors contributed substantially to the conclusions of the paper.

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## Abbreviations

The following abbreviations are used in this manuscript:

AAEA	American Agricultural Economics Association
APMO	average percent of majority opinions
BEA	business efficiency appraisal
BFA	business financial appraisal
CEARC	Centre of Excellence in Accounting and Reporting for Co-operatives
CEO	chief executive officer
CICOPA	Comité International des Coopératives de Production et Artisanales (in French, standing for “International Organization of Cooperatives in Industry and Services”)
EU	European Union
GRI	Global Reporting Initiative
ICA	International Co-operative Alliance
ILO	International Labour Organization
IOF	investor-owned firm
LEED	Leadership in Energy and Environmental Design
OCDC	U.S. Overseas Cooperative Development Council
OMA	objective membership appraisal
RAND	Research ANd Development (organization)
SBA	subjective business appraisal
SD	standard deviation
SMA	subjective membership appraisal
SROI	social return on investment
UN	United Nations
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

## Appendix A

**Table A1.** Overview of empirical studies on the performance of cooperatives.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Babb and Boynton (1981) [87]	1979, USA, 28 cooperatives vs. 20 investor-owned firms (IOFs)	Dairy	BFA/BEA/OMA	Profitability, debt, and efficiency ratios/cost minimization/prices paid, scope and quality of services to farmers (e.g., field services, information provision)
Chen et al. (1985) [174]	1975–1980, USA, 32 cooperatives vs. 35 IOFs	Dairy, fruit and vegetables, grain, fats and oils	BFA	Asset and sales growth, profitability and debt ratios
Schrader et al. (1985) [175]	1979–1983, USA, unspecified number of cooperatives	Dairy, grain, farm supply	BFA	Profitability, debt, and efficiency ratios
Porter and Scully (1987) [176]	1972, USA, 28 cooperatives vs. 28 IOFs	Dairy	BEA	Technical, scale, and allocative efficiency
Chapman and Christy (1989) [101]	1979–1987, USA, 10 cooperatives vs. 8 IOFs	Sugar	BEA	Cost efficiency
Sexton et al. (1989) [95]	1980–1985, USA, 22 cooperatives	Cotton	BEA	Allocative efficiency
Venieris (1989) [177]	1981–1983, Greece	Wine	BFA	Profitability, debt, and liquidity ratios
Lerman and Parliament (1990) [74]	1976–1987, USA, 18 cooperatives vs. 18 to 160 IOFs (across sectors)	Dairy, fruit and vegetables	BFA	Profitability, debt, liquidity, and efficiency ratios
Parliament et al. (1990) [60]	1971–1987, USA, 9 cooperatives vs. 75 to 160 IOFs	Dairy	BFA	Profitability, debt, liquidity, and efficiency ratios
Lerman and Parliament (1991) [64]	1970–1987, USA, 43 cooperatives	Grain, dairy, food, farm supply	BFA	Profitability, debt, liquidity, and efficiency ratios

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Royer (1991) [178]	1987, USA, 2028 cooperatives vs. unspecified number of IOFs	Cotton, dairy, grain, fruit and vegetables, livestock, farm supply, sugar, multiproduct	BFA	Liquidity and debt ratios
Akridge and Hertel (1992) [102]	1980–1990, USA, 76 cooperatives vs. 46 IOFs	Grain, farm supply	BEA	Cost efficiency
Schroeder (1992) [106]	1979–1988, USA, 29 cooperatives	Grain, farm supply	BEA	Scale and scope elasticities
Barton et al. (1993) [179]	1985–1989, USA, 114 cooperatives	Grain, farm supply	BFA	Profitability, liquidity, and efficiency ratios
Caputo and Lynch (1993) [99]	1980–1985, USA, 22 cooperatives	Cotton	BEA	Technical efficiency
Fulton and King (1993) [161]	1988–1989, USA, 19 cooperatives	Grain	BEA	Marketing margin per unit of capacity
Hind (1994) [58]	1992, UK, unspecified number of cooperatives vs. IOFs	Various agricultural sectors (not specified)	BFA	Profitability, debt, and liquidity ratios
Rogers and Petraglia (1994) [81]	1982, USA, 100 cooperatives	Various agricultural sectors (not specified)	BFA	Lerner index, advertising-to-sales ratio, capital-output ratio, market shares, sales growth
Featherstone and Rahman (1996) [180]	1979–1988, USA, 20 cooperatives	Farm supply, marketing (not specified)	BEA	Allocative efficiency
Harris and Fulton (1996) [75]	1986–1993, Canada, 94 cooperatives (across sectors) vs. 77 IOFs (across sectors)	Dairy, grain, oilseeds, fruit and vegetables, feed, fishing, retail grocery	BFA	Liquidity, profitability, efficiency, debt, and growth ratios
Mauget and Declerck (1996) [181]	1990–1991, several European countries, 33 cooperatives	Dairy, grain, meat, farm supply	BFA	Profitability and efficiency ratios
Moller et al. (1996) [65]	1987–1992, USA, 718 cooperatives	Grain, farm supply	BFA	Profitability and debt ratios
Bergman (1997) [182]	1995, 6 EU countries and USA, unspecified number of cooperatives	Dairy, grain, meat, fruit and vegetables	BFA	Market shares
Gentzoglani (1997) [84]	1986–1991, Canada, 6 cooperatives vs. 6 IOFs	Dairy	BFA	Liquidity, debt, and profitability ratios
Trechter et al. (1997) [183]	1993–1994, USA, 5 cooperatives	Grain, farm supply	BFA	Profitability ratio (i.e., return on assets)
Ling and Liebrand (1998) [76]	1986–1996, USA, 25 cooperatives vs. 15 IOFs	Dairy	BFA	Profitability ratio (i.e., return on equity), extra value index (EVI)
Oustapassidis et al. (1998) [155]	1990–1994, Greece, 5 cooperatives vs. 25 IOFs	Dairy	BFA	Profitability, debt, liquidity, and efficiency ratios, growth rates
Sueyoshi et al. (1998) [100]	1988, Japan, 38 cooperatives	Various agricultural sectors (not specified)	BEA	Technical, scale, and allocative efficiency, production index, comparative cost index and reduction ratio
Worthington (1998) [184]	1995, Australia, 63 credit unions	Retail banking	BEA/BFA	Technical efficiency/profitability ratios
Brown et al. (1999) [185]	1992–1995, Australia, 94 to 72 credit unions	Retail banking	BEA	Technical efficiency
Fukuyama et al. (1999) [186]	1992–1996, Japan, 393 to 355 credit cooperatives	Retail banking	BEA	Technical, scale, and allocative efficiency
Gorton and Schmid (1999) [187]	1987–1990, Austria, 73 cooperative banks	Retail banking	BFA	Profitability ratio (i.e., return on assets)
Worthington (1999) [188]	1995, Australia, 233 credit unions	Retail banking	BEA	Technical and scale efficiency
Ariyaratne et al. (2000) [189]	1988–1992, USA, 89 cooperatives	Grain, farm supply	BEA/BFA	Technical, allocative, and scale efficiency/Herfindahl index, profitability, liquidity, debt, and efficiency ratios

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Doucouliaagos and Hone (2000) [98]	1969–1996, Australia, 2 cooperatives and unspecified number of IOFs	Dairy	BEA	Technical efficiency, total factor productivity
Escho (2001) [190]	1985–1993, Australia, 106 credit unions	Retail banking	BEA/BFA	Cost efficiency/profitability and liquidity ratios
Singh et al. (2001) [90]	1992–1997, India, 13 cooperatives vs. 10 IOFs	Dairy	BEA	Technical, allocative, and cost efficiency
Baourakis et al. (2002) [72]	1993–1998, Greece, 10 cooperatives vs. 17 IOFs	Fruit juice, olive oil	BFA	Profitability, liquidity, debt, and efficiency ratios
McKillop et al. (2002) [157]	1996, UK, 104 credit unions	Retail banking	BEA/BFA	Cost and scale efficiency/loan, liquidity, and bad-debt ratios, asset growth
Mosheim (2002) [191]	1988–1993, Costa Rica, 28 cooperatives vs. 16 IOFs	Coffee	BEA	Technical, allocative, scale, and cost efficiency
Ananiadis et al. (2003) [77]	1990–1998, Greece, 5 cooperatives vs. 26 IOFs	Dairy	BFA	Profitability, debt, and liquidity ratios
Arcas and Ruiz (2003) [59]	Undisclosed data collection period, Spain, 43 cooperatives	Fruit and vegetables	BFA	Profitability and efficiency ratios
Kenkel et al. (2003) [66]	1990–2001, USA, 22 cooperatives	Grain, cotton, farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios, sales growth
Richards and Manfredo (2003) [192]	1980–1998, USA, unspecified number of cooperatives	Dairy, fruit and vegetables, poultry, sugar grain, cotton, farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios, sales growth
Barton (2004) [193]	1996–2003, USA, 8 cooperatives	Grain, dairy, vegetables, beef, poultry, farm supply	BFA	Profitability, debt, and liquidity ratios
Brester and Boland (2004) [194]	1996–2000, USA, 1 cooperative	Sugar	BFA	Profitability
Boyle (2004) [96]	1961–1987, Ireland, unspecified number of cooperatives	Dairy	BEA	Technical and allocative efficiency
Hardesty and Salgia (2004) [195]	1991–2002, USA, 41 cooperatives (across sectors) vs. 20 to 1024 IOFs (across sectors)	Dairy, grain, fruit and vegetables, farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios
Kyriakopoulos et al. (2004) [107]	1999, The Netherlands, 29 marketing, 16 supply, and 7 multipurpose cooperatives	Various agricultural sectors, farm supply	SBA	CEO's view on performance (i.e., 5-point multi-item scale, focus on the cooperative as a firm, not the members' activities)
Mishra et al. (2004) [120]	1998, USA, 1385 cooperative members vs. 1501 IOF suppliers	Grain, fruit and vegetables, tree nuts, nursery, beef, hog, poultry, dairy, other crops, farm supply	OMA	Farm profitability ratios (i.e., net farm income plus interest payments to total assets, labor and management income), farm leverage ratio
Chaddad et al. (2005) [196]	1991–2000, USA, 876 cooperatives	Grain, farm supply, multi-purpose	BFA	Profitability, liquidity, debt, and efficiency ratios
Desrochers and Fischer (2005) [197]	1996–2002, 17 countries, 17,000 cooperatives	Financial services	BEA/BFA	X-efficiency/profitability and liquidity ratios
Ebneth and Theuvsen (2005) [67]	2001–2004, 9 European countries, 11 cooperatives	Dairy	BFA	Profitability, debt, and efficiency ratios, degree of internationalization (i.e., foreign sales to total sales ratio)
Hailu et al. (2005) [92]	1984–2001, Canada, 54 cooperatives	Fruit and vegetables	BEA	Cost efficiency
Bond (2005) [198]	2003–2005, USA, 21 cooperatives	Farm supply, other (unspecified)	BFA	Debt, liquidity, and efficiency ratios
Piesse et al. (2005) [199]	1986–1988 and 1996–1998, South Africa, 16 cooperatives	Grain	BEA	Technical and allocative efficiency

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Galdeano-Gómez et al. (2006) [200]	1994–2002, Spain, 51 cooperatives	Fruit and vegetables	BEA/other	Total factor productivity /environmental performance (i.e., members' waste production above the accepted levels, the cooperative's expenditure on implementation of certified environmental systems)
Ling (2006) [68]	1992–1996 and 2000–2004, USA, 21 cooperatives	Dairy	BFA	Profitability ratio (i.e., return on equity), extra value index (EVI)
Sergaki and Semos (2006) [82]	1995–2000, Greece, 93 cooperatives vs. 3281 IOFs	Various agricultural sectors	BFA	Profitability, debt, and efficiency ratios, market shares, export intensity (i.e., export to total sales ratio)
Barros and Santos (2007) [103]	1996–2000, Portugal, 7 cooperatives vs. 20 IOFs	Wine	BEA	Technical efficiency
Bhuyan (2007) [29]	2000, USA, 73 members from 20 cooperatives	Fruit and vegetables	SMA/OMA	Overall dissatisfaction, dissatisfaction with price, management and relations, members' influence in decision-making, withdrawal intentions, membership-related beliefs (e.g., marketing agreement, motives for joining)/side-selling
Boyd et al. (2007) [63]	1994–2003, USA, 648 cooperatives	Grain, farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios
Hailu et al. (2007) [97]	1984–2001, Canada, 96 cooperatives	Grain, dairy, fruit and vegetables	BEA/BFA	Cost efficiency/profitability and debt ratios
Notta and Vlachvei (2007) [78]	1990–2001, Greece, 5 cooperatives vs. 34 IOFs	Dairy	BFA	Profitability, debt, and efficiency ratios, market shares
Guzmán and Arcas (2008) [88]	2001–2003, Spain, 46 to 108 cooperatives	Fruit and vegetables	BEA/BFA	Technical and scale efficiency/efficiency ratios
McKee (2008) [86]	2002–2006, USA, 120 cooperatives	Grain, farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios
Bond (2009) [62]	2003–2005, USA, 44 cooperatives	Dairy, fruit, farm supply, other (not specified)	BFA	Liquidity, debt, and efficiency ratios
Chibanda et al. (2009) [23]	2007, South Africa, 10 cooperatives	Vegetables, poultry, beef, bread	OMA	Price paid (or fair net surplus), reliance on government funds, training of members, marketing arrangements, governance arrangements (e.g., fair elections and secret ballots, audited accounts, information provision)
Guzmán et al. (2009) [91]	2001–2005, Italy and Spain, 187 (81 + 106) cooperatives	Fruit and vegetables	BEA	Technical and scale efficiency
Magdaleno and García-García (2009) [201]	2004, Spain, 16 cooperatives vs. 102 IOFs	Various agricultural sectors	BEA	Technical efficiency
McKee et al., (2009) [69]	2003–2007, USA, 58 cooperatives	Grain, farm supply	BFA	Profitability, liquidity, and debt ratios
Glass et al. (2010) [158]	2006, Ireland, 388 credit unions	Retail banking	BEA/BFA	Economic efficiency/debt, liquidity, and loan ratio, asset growth
Maietta and Sena (2010) [104]	1996–2001, Italy, 63 cooperatives vs. 40 IOFs	Wine	BEA/BFA	Technical efficiency/debt ratio
Arcas et al. (2011) [202]	Undisclosed data collection period, Spain, 108 cooperatives	Fruit and vegetables	BEA	Technical efficiency
Candemir et al. (2011) [203]	2004–2008, Turkey, 37 cooperatives	Hazelnuts	BEA	Technical efficiency
Heyder et al. (2011) [156]	2005–2009, various European countries, 21 (14 + 7) cooperatives	Dairy, meat	BFA	Profitability ratios, degree of internationalization (i.e., foreign sales to total sales ratio)

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Soboh et al. (2011) [73]	1996–2004, Germany, Belgium, The Netherlands, France, Ireland, 46 cooperatives vs. 124 IOFs	Dairy	BFA	Profitability, debt, liquidity, and efficiency ratios
Basterretxea and Martínez (2012) [204]	2006, Spain, 44 cooperatives vs. 817 IOFs	Industrial sector	SBA	Key informant's (e.g., CEO, sales manager, operations manager) view on current and future performance (i.e., 5-point multi-item scale on profitability, sales growth and trade margins)
Costa et al. (2012) [205]	2008, Italy, 13,938 cooperatives	Various sectors	BFA	Profitability, efficiency, and debt ratios
McKee and Larsen (2012) [206]	2002–2008, USA, 82 cooperatives	Grain, farm supply	BFA	Profitability and debt ratios
Ory and Lemzeri (2012) [207]	1995–2007 and 2007–2010, France and other European countries (unspecified), 4 cooperatives vs. 30 PLCs	Retail banking	BFA	Profitability, debt, and efficiency ratios
Patlolla et al. (2012) [208]	1992–2007, India, 341 cooperatives vs. 206 IOFs vs. 46 public factories	Sugar	BEA	Technical efficiency
Rosairo et al. (2012) [115]	2008, Sri Lanka, 6 cooperatives	Vegetables, rice, grain, pulses, farm supply	OMA/BFA	Governance arrangements (e.g., audited accounts, information provision)/liquidity and debt ratios
Ruben and Heras (2012) [117]	Undisclosed data collection period, Ethiopia, 5 cooperatives (100 members in each)	Coffee	OMA	Profits obtained by members, amount delivered
Soboh et al. (2012) [89]	2004, Belgium, The Netherlands, Denmark, Ireland, France, Germany, 43 cooperatives vs. 90 IOFs	Dairy	BEA	Technical, scale, and allocative efficiency
Bijman et al. (2013) [83]	2006, The Netherlands, 33 cooperatives	Dairy, fruit and vegetables, grain, meat, flowers, potato starch, farm supply, multipurpose	BFA	Profitability ratios, asset growth, sales growth
Cechin et al. (2013) [118]	2011, Brazil, 55 cooperative members vs. 42 IOF suppliers	Broiler	OMA/SMA	Production efficiency and quality/buyer-supplier relationship features (e.g., communication frequency, market risk reduction, adaptation support, behavioral uncertainty)
Dios-Palomares et al. (2013) [105]	2005–2006, Spain, 40 cooperatives vs. 48 IOFs	Olive oil	BEA/other	Technical and scale efficiency/proportion of permanent jobs
Franken and Cook (2013) [109]	2005–2010, USA, 367 cooperatives	Various agricultural sectors (unspecified), farm supply, multi-purpose	BFA/SBA	Profitability ratios/board chair's view on cooperative health (i.e., 10-point multi-item scale consisting of items for member satisfaction, competitive position, profitability, ability to achieve vision, and overall performance)
Hanisch et al. (2013) [31]	2000–2010, EU-27, unspecified number of cooperatives	Dairy	OMA/BFA	Prices paid to members/market shares
Hernández-Espallardo et al. (2013) [125]	2009, Spain, 321 cooperative members	Fruit and vegetables	SMA	Overall satisfaction with the cooperative (i.e., 5-point multi-item scale), price satisfaction (i.e., 5-point single item scale), intention to continue (i.e., 5-point multi-item scale)
Huang et al. (2013) [94]	2009, China, 896 cooperatives	Gain, fruit and vegetables, livestock, fish	BEA	Technical efficiency, scale efficiency

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Kalogeras et al. (2013) [24]	1999–2010, The Netherlands, 14 cooperatives	Dairy, fruit and vegetables, grain, meat, flowers, potato starch, farm supply, multipurpose	BFA	Profitability, liquidity, and debt ratios
Moradi and Nematollahi (2013) [209]	2006–2011, Iran, 120 cooperatives	Agriculture, services, industrial, retail banking, other	BFA/other	Profitability and debt ratios/employment (i.e., number of employees)
Mujawamariya et al. (2013) [121]	2006, Rwanda, 121 members of 4 cooperatives	Coffee	OMA	Side-selling
O'Brien et al. (2013) [210]	2012, Kenya and Uganda, 2246 members of 4 cooperatives	Dairy	SMA	Members' reporting of membership benefits and services (i.e., timely payment, convenient payment, general credit, training, purchase of excess quantities, priced paid, inputs provided, animal health services, credit and saving services)
Sharifi (2013) [211]	2008–2012, India, 1 cooperatives	Farm supply	BFA	Profitability, liquidity, debt, and efficiency ratios
Wheelock and Wilson (2013) [212]	1989 and 2006, USA, unspecified number of credit unions	Retail banking	BEA	Cost and scale efficiency, cost productivity
Abate et al. (2014) [213]	2008, Ethiopia, 564 cooperative members vs. 1074 IOF suppliers	Grain	OMA	Technical efficiency at the farm level, access to capital
Arcas-Lario et al. (2014) [130]	Uncertain data collection period, Spain, 277 cooperative members	Fruit and vegetables	SMA	Overall satisfaction with the cooperative (i.e., 11-point multi-item scale), intention to continue (i.e., 11-point 2-item scale)
Fiordelisi and Mare (2014) [214]	1998–2009, Austria, France, Germany, Italy, Spain, 2529 cooperative banks	Retail banking	BFA	Profitability ratios, Lerner index, Herfindahl index
Forker et al. (2014) [146]	1996–2008, Northern Ireland, 188 credit unions	Retail banking	BFA/other	Asset growth, payout ratio (i.e., dividends and loan rebates to total assets)/community payments ratio (i.e., community expenditure to total assets)
Jardine et al. (2014) [215]	1975–2001, USA, 1 cooperative vs. 1 IOF	Fish	BEA	Price premium, quality improvement
Liebrand and Ling (2014) [123]	1993–2012, USA, 1736 cooperative members	Dairy	SMA	Overall satisfaction with cooperative, satisfaction with pricing policies, with management and board of directors (BoD), with cooperative services, with information flow, and with management of operations, members' influence on internal decision-making, withdrawal intentions
Othman et al. (2014) [216]	2011, Malaysia, 56 (second-order) cooperatives	Various sectors	BEA	Technical efficiency
Yang and Chaddad (2014) [110]	2005–2010, USA, 367 cooperatives	Various agricultural sectors (unspecified), farm supply, multi-purpose	BFA/SBA	Profitability ratios/board chair's view on cooperative health (i.e., 10-point multi-item scale consisting of items for member satisfaction, competitive position, profitability, ability to achieve vision, and overall performance)
Alho (2015) [124]	2014, Finland, 682 cooperative members	Dairy, meat, farm supply	SMA	Perceived membership benefits (i.e., 5-point single item scales relating to good services, price paid, non-pecuniary benefits, good bargaining position in the market, stable market channel)

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Franken and Cook (2015) [27]	2005–2010, USA, 367 cooperatives	Various agricultural sectors (unspecified), farm supply, multi-purpose, service	BFA/SBA	Profitability ratios/board chair's view on member satisfaction, on competitive position, on profitability, on ability to achieve vision, and on overall performance (i.e., 10-point single item scales)
Jones and Kalmi (2015) [217]	2001–2009, Finland, 202 cooperative banks	Retail banking	BFA	Profitability and debt ratios
Li et al. (2015) [218]	1992–1995, USA, 100 cooperatives vs. 50 IOFs	Grain, farm supply	BFA	Profitability, efficiency, liquidity, and debt ratios
Melia-Marti and Martinez-Garcia (2015) [70]	1995–2005, Spain, 147 cooperatives	Various agricultural sectors	BFA	Profitability, liquidity, efficiency, and debt ratios
Mojo et al. (2015) [7]	2014, Ethiopia, 139 members of 4 cooperatives	Coffee	SMA/other	Satisfaction with membership (i.e., one 5-point item as part of a multi-item scale measuring other aspects as well, such as satisfaction with production)/environmental performance (i.e., 5-point multi-item scale on members' change in fertilizer use, soil erosion, soil fertility, crop diversity, herbicide use)
Wollni and Fischer (2015) [122]	2004, Costa Rica, 180 members of four cooperatives	Coffee	OMA	Side-selling
Benos et al. (2016) [25]	2006 and 2010, Greece, 114 + 25 cooperatives	Various agricultural sectors	SBA	CEO's view on organizational performance (i.e., 7-point multi-item scale)
Chagwiza et al. (2016) [116]	2012, Ethiopia, 192 members of 5 cooperatives vs. 192 non-members	Dairy	OMA	Proportion of specific agricultural income to total household income, output productivity
Costa and Carini (2016) [147]	2008–2011, Italy, 7414 cooperatives	Various sectors	BFA/other	Profitability, debt, and efficiency ratios/employment (i.e., number of employees)
Feng et al. (2016) [128]	2007 and 2011, Sweden, 634 members of 3 cooperatives (286 + 285 + 63)	Grain, farm supply	SMA	Satisfaction with membership aspects (i.e., 5-point multi-item scale), loyalty (i.e., 5-point single item scale)
Jones et al. (2016) [219]	2001–2009, Finland, 202 cooperative banks	Retail banking	BFA/OMA	Profitability ratio (i.e., return on assets)/membership growth rate, churn rate
Hammad et al. (2016) [220]	2011, Malaysia, 72 cooperatives	Various sectors	SBA	Board chair's view on financial performance (i.e., 5-point multi-item scale),
Kontogeorgos et al. (2016) [221]	2006–2010, Greece, 34 cooperatives	Various agricultural sectors (unspecified)	BFA	Profitability, liquidity, and efficiency ratios
Mathuva (2016) [222]	2008–2013, Kenya, 212 credit unions	Retail banking	BFA	Profitability, liquidity, and debt ratios
Mathuva et al. (2016) [223]	2008–2013, Kenya, 212 credit unions	Retail banking	BFA	Profitability, liquidity, and debt ratios
McKee and Kagan (2016) [159]	1995–2013, USA, unspecified number of credit unions vs. IOF banks	Retail banking	BEA/BFA	Cost efficiency/profitability ratio, loan ratio (i.e., loan to assets ratio)
Valette et al. (2016) [79]	2009–2015, France, 365 cooperatives vs. 586 IOFs	Wine	BFA	Profitability and debt ratios, export intensity (i.e., export to total sales ratio)
Van Rijsbergen et al. (2016) [129]	2009 and 2013, Kenya, 218 members of 3 cooperatives	Coffee	SMA/OMA	Satisfaction with technical and trade assistance (i.e., 5-point single item scales)/side-selling

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Wouterse and Francesconi (2016) [224]	2013, Ethiopia, Malawi and Senegal, 253 (50 + 103 + 100) cooperatives	Fruit and vegetables, dairy, grain, nuts, rice, soybean	OMA	Organizational health index (i.e., four binary indicators: engagement in collective marketing, membership growth, equity growth, and side selling)
Chareonwongsak (2017) [225]	Undisclosed data collection period, Thailand, 319 cooperatives	Various sectors	BFA	Profitability ratio (i.e., return on equity)
Ma and Abdulai (2017) [119]	2013, China, 208 cooperative members vs. 273 non-members	Apples	OMA	Farm profitability and income
Rebelo et al. (2017) [71]	2003–2012, Portugal, 11 cooperatives	Olive oil	BFA	Profitability, liquidity, and debt ratios
Sisay et al. (2017) [108]	Undisclosed data collection period, Ethiopia, 24 cooperatives	Seeds	SBA	External experts' view on financial performance (i.e., 5-point multi-item scale), member satisfaction (i.e., 5-point multi-item scale), members' livelihood (i.e., 5-point multi-item scale)
Sisay et al. (2017) [112]	2016, Ethiopia, 190 members of 29 cooperatives	Seeds	SMA/SBA	Cooperative leaders' and members' view on financial performance (i.e., 5-point multi-item scale), member satisfaction (i.e., 5-point multi-item scale), and members' livelihood (i.e., 5-point multi-item scale)/customer satisfaction (i.e., 5-point multi-item scale)
Susanty et al. (2017) [127]	2010, Indonesia, 170 members of 14 cooperatives	Dairy	SMA	Price satisfaction (i.e., 5-point multi-item scale), loyalty (i.e., 5-point multi-item scale), perceived business performance (i.e., 5-point multi-item scale)
Tana et al. (2017) [111]	2012, Brazil, 331 cooperatives	Dairy	SBA	Perceived economic performance by key informants (i.e., 7-point multi-item scale)
Yamori et al. (2017) [160]	2009–2014, Japan, 154 credit unions	Retail banking	BEA/BFA	Technical efficiency/debt ratios, loan ratio (i.e., loan to deposits)
Cadot and Ugaglia (2018) [28]	2005–2011, France, 39 cooperatives	Wine	OMA/BFA	Prices paid/debt ratios
Figueiredo and Franco (2018) [126]	2016 and 2017, Portugal, 194 members of 3 cooperatives	Wine	SMA	Overall satisfaction with the cooperative (i.e., 5-point multi-item scale)
Grashuis (2018) [226]	2014, USA, 1000 cooperatives	Grain, farm supply, dairy, fruit and vegetables, cotton, livestock, sugar, other	BFA	Profitability, debt, and efficiency ratios, DuPont identity
Martínez-Victoria et al. (2018) [80]	2009–2012, Spain, 8104 IOFs vs. 249 cooperatives	Fruit and vegetables	BFA	Profitability, liquidity, and debt ratios
Martins and Lucato (2018) [227]	2015, Brazil, 53 cooperatives	Various agricultural sectors (unspecified)	BFA	Profitability, liquidity, and debt ratios
Co-operatives UK [19]	Designed for UK cooperatives, but applicable to all countries	Applicable to all sectors	BFA/OMA/SMA/other	Profitability, leverage, debt, and efficiency ratios, turnover change, profit distribution to members/membership churn, side-selling, hours of member training provided, participation rate at general assemblies, diversity of members (e.g., age, gender, ethnicity, education)/member and customer (non-member) satisfaction/employee satisfaction, loyalty, and training, amount invested in benefitting local communities, environmental impact (e.g., emission and waste reduction)

Table A1. Cont.

Authors	Sample Profile	Sector(s)	Sub-Category	Performance Metrics
Gordon Nembhard and Hammond Ketilson [162]	Applicable to all countries	Designed for credit unions but applicable to all sectors	OMA/Other	Service provision (e.g., quality, complains handling), membership growth/community involvement and economic development (e.g., donations, sponsorships, scholarships, volunteerism, local sourcing, waiving service fees, training), employee benefits (e.g., salaries, hiring practices), environmental impact (e.g., conservation policies)
METRICS U.S. Overseas Cooperative Development Council (OCDC) [163]	Designed for developing countries	Designed for agricultural sectors	BFA/OMA	Profitability, capital structure (e.g., debt, reserves)/diversity of members and the BoD (age, gender), governance arrangements (e.g., BoD election, audited accounts, information provision), participation rate at general assemblies, training services to members
World Co-operative Monitor (ICA) [164]	Applicable to all countries	Applicable to all sectors	BFA/OMA/other	Turnover, income data (only for financial cooperatives), composition of total equity and liabilities (only for financial cooperatives)/number of elected officers, participation rate at general assemblies, diversity of members and the BoD (age, gender)/number of employees and volunteers, amount granted for donations, scholarships and sponsorships

## Appendix B

Table A2. Overview of empirical studies on the performance of social enterprises.

Authors	Sector(s)	Metrics
Somers (2005) [165]	Work integration, food and drinks, financial services, business support	A modified version of the balanced scorecard
Bull (2007) [166]	Health and social care, education, food and drinks, environmental protection, ICT, employment, furniture, arts, business support	A modified version of the balanced scorecard
Rotheroe and Richards (2007) [228]	Furniture	Social return on investment (SROI)
Meadows and Pike (2010) [229]	Financial services	A modified version of the balanced scorecard
Bagnoli and Megali (2011) [133]	Work integration and community services (e.g., social tourism, bulk waste, bike rental)	<ul style="list-style-type: none"> <li>a. Financial statement analysis</li> <li>b. Social effectiveness—a variant of the “logic model” of assessment/impact value chain model (i.e., sustainability of inputs, outputs-activities, outcomes to intended beneficiaries, social and economic impacts on the wider community)</li> <li>c. Institutional legitimacy (institutional coherence, compliance with laws and secondary norms)</li> </ul>
Millar and Hall (2013) [148]	Health and social care	<ul style="list-style-type: none"> <li>a. SROI</li> <li>b. Internal tools (not specified)</li> </ul>
Arena et al. (2015) [141]	Energy production and distribution	A variant of the “logic model” of assessment/impact value chain based on inputs, outputs, and outcomes, and exemplifying three dimensions: efficiency (output/input), effectiveness (output characteristics), and impact (long-term effects of the output on the target community)

Table A2. Cont.

Authors	Sector(s)	Metrics
Battilana et al. (2015) [230]	Work integration	a. Economic productivity b. Social performance (i.e., number of beneficiaries who found a regular job after completing their term at the social enterprises)
Hall et al. (2015) [231]	Various sectors	SROI
Liu et al. (2015) [232]	Not specified	a. Key informant's view on economic performance (i.e., 7-point multi-item scale for commercial marketing achievements and economic value creation) b. Key informant's view on social performance (i.e., 7-point multi-item scale for social marketing achievements and social value creation)
Crucke and Decramer (2016) [135]	Work care and integration, social workshops, local services	a. Key informant's view on economic performance (i.e., 8-point multi-item scale) b. Key informant's view on environmental performance (i.e., 7-point multi-item scale and dichotomous items) c. Key informant's view on community performance (i.e., 7-point multi-item scale) d. Key informant's view on human performance (i.e., 7-point multi-item scale) e. Key informant's view on governance performance (i.e., 7-point multi-item scale and dichotomous items)
Luke (2016) [136]	Employment and training	Statement of social performance, consisting of a profit measure and a social contribution measure (i.e., inputs in terms of cash and in-kind contributions, and outputs in terms of realized benefits of the program)
Arogyaswamy (2017) [145]	Solar lighting, water provision in drought-affected areas, healthcare, remote delivery, work integration	A time-based variant of the "logic model" of assessment/impact value chain model
Cordes (2017) [169]	-	Cost-benefit analysis and SROI
Nicholls (2017) [170]	-	SROI

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